MONTANA
Natural Heritage Program

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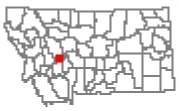

Latitude	Longitude
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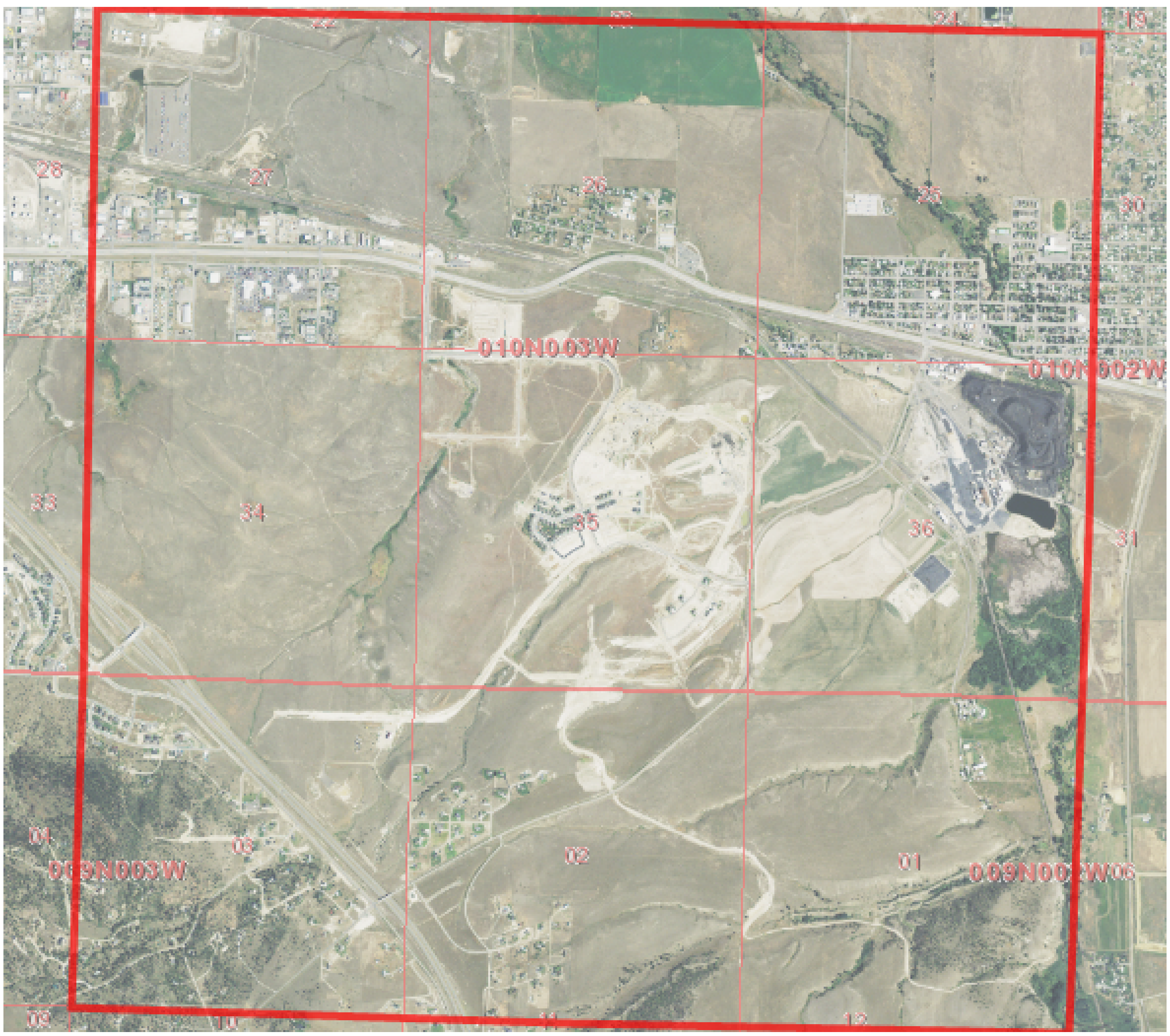
46.60343	-111.97782

Summarized by:
010N003W035
(Buffered PLSS Section)



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Environmental Summary

Table of Contents

Introduction to Environmental Summary Report

Environmental Summary Reports from the Montana Natural Heritage Program (MTNHP) provide information on species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. For information on environmental permits in Montana, please see permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Index of Environmental Permits for Montana and our Suggested Contacts for Natural Resource Management Agencies. The report for your area of interest consists of introductory and related materials in this PDF and an Excel workbook with worksheets summarizing information managed in the MTNHP databases for: (1) species occurrences; (2) other observed species without species occurrences; (3) other species potentially present based on their range, presence of associated habitats, or predictive distribution model output if available; (4) structured surveys that follow a protocol capable of detecting one or more species; (5) land cover mapped as ecological systems; (6) wetland and riparian mapping; (7) land management categories; and (8) biological reports associated with plant and animal observations. If your area of interest corresponds to a statewide polygon layer (e.g., watersheds, counties, or public land survey sections) information summaries in your report will exactly match those boundaries. However, if your report is for a custom area, users should be aware that summaries do not correspond to the exact boundaries of the polygon they have specified, but instead are a summary across a layer of hexagons intersected by the polygon they specified as shown on the report cover. Summarizing by these hexagons which are one square mile in area and approximately one kilometer in length on each side allows for consistent and rapid delivery of summaries based on a uniform grid that has been used for planning efforts across the western United States (e.g., Western Association of Fish and Wildlife Agencies - Crucial Habitat Assessment Tool).

In presenting this information, MTNHP is working towards assisting the user with rapidly assessing the known or potential species and biological communities, land management categories, and biological reports associated with the report area. Users are reminded that this information is likely incomplete and may be inaccurate as surveys to document species are lacking in many areas of the state, species' range polygons often include regions of unsuitable habitat, methods of predicting the presence of species or communities are constantly improving, and information is constantly being added and updated in our databases. **Field verification by professional biologists of the absence or presence of species and biological communities in a report area will always be an important obligation of users of our data. Users are encouraged to only use this environmental summary report as a starting point for more in depth analyses and are encouraged to contact state, federal, and tribal resource management agencies for additional data or management guidelines relevant to your efforts. Please see the Appendix for introductory materials to each section of the report, additional information resources, and a list of relevant agency contacts.**

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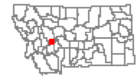
A program of the **Montana State Library's Natural Resource Information System**

Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
N Suitable (native range)	C Common	Y Native / Year-round	Count of obs with 'good precision' (<=1000m)
O Optimal Suitability	O Occasional	S Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
M Moderate Suitability		W Winter	
L Low Suitability		M Migratory	
I Suitable (introduced range)		N Non-native	
		H Historic	



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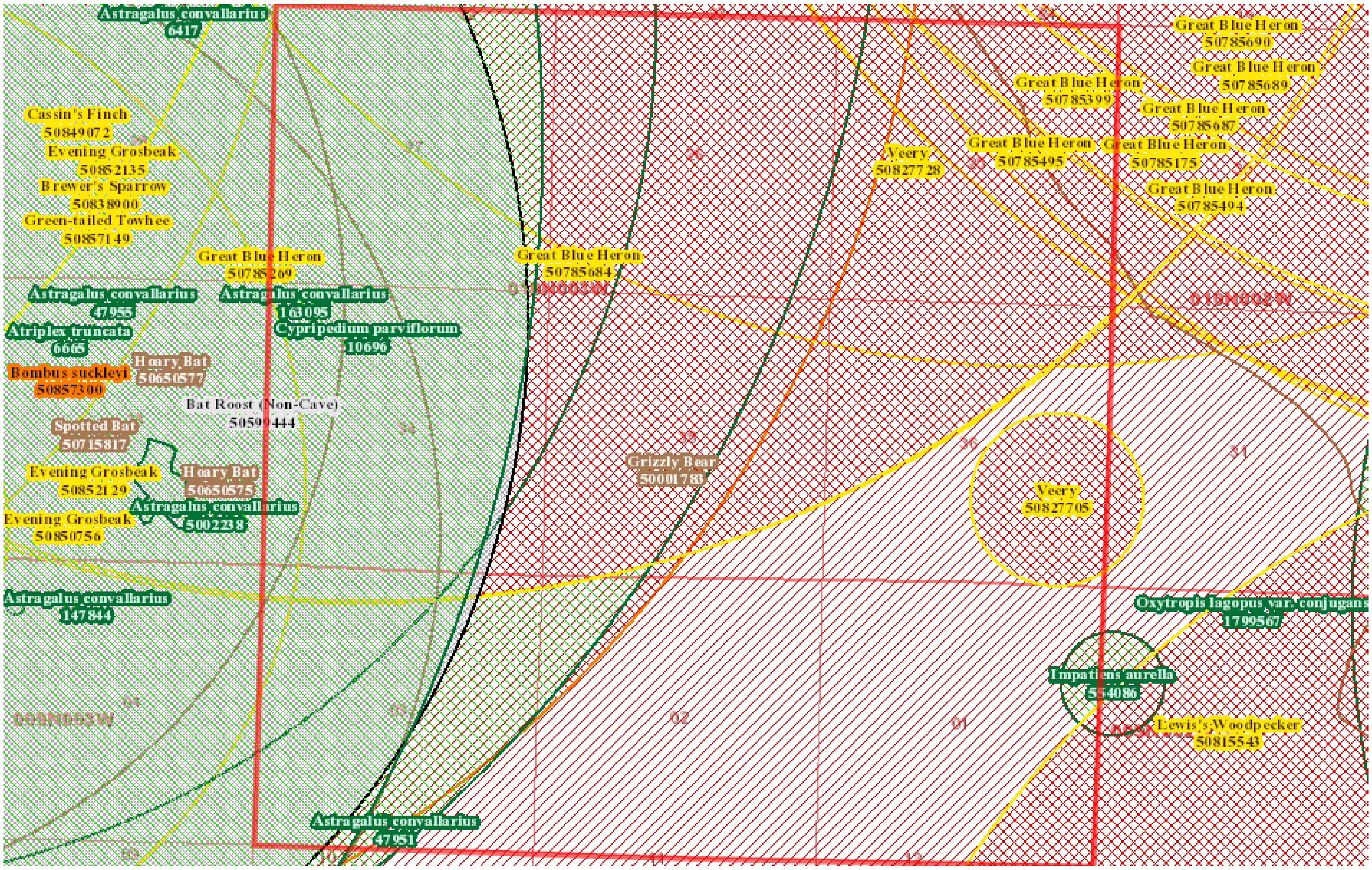
Native Species

Summarized by: **010N003W035** *(Buffered PLSS Section)*
All Species (not filtered by Status)



Species Occurrences

	USFWS Sec7	# SO	# Obs	Predicted Model	Associated Habitat	Range
V - **Astragalus convallarius** *(Lesser Rushy Milkvetch)* SOC		3	1			Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Species of Conservation Concern in Forests (HLC)** MNPS: **2**
Delineation Criteria Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: May 13, 2022)
Predicted Models: O 14% Optimal (inductive), M 75% Moderate (inductive), L 11% Low (inductive) **Associated Habitats:** C 49% Common, O 2% Occasional

	USFWS Sec7	# SO	# Obs	Predicted Model	Associated Habitat	Range
M - **Hoary Bat** *(Lasiurus cinereus)* SOC		2				S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G3G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Delineation Criteria Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, and definitively identified roosting individuals) of adults or juveniles during the active season. Point observation location is buffered by a minimum distance of 3,500 meters in order to be conservative about encompassing the maximum reported foraging distance for the congeneric Lasiurus borealis and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 18, 2020)
Predicted Models: M 32% Moderate (inductive), L 68% Low (inductive) **Associated Habitats:** C 54% Common, O 35% Occasional

	USFWS Sec7	# SO	# Obs	Predicted Model	Associated Habitat	Range
M - **Spotted Bat** *(Euderma maculatum)* SOC		1				S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (BD)** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**
Delineation Criteria Confirmed area of occupancy based on the documented presence (mistnet captures, definitively identified acoustic recordings, and definitively identified roosting individuals) of adults or juveniles. Point observation location is buffered by a distance of 10,000 meters in order to encompass the reported maximum foraging distance for the species in British Columbia. If the locational uncertainty associated with the observation is greater than 10,000 meters, the observation is not valid for creation of a species occurrence. (Last Updated: Oct 06, 2021)
Predicted Models: M 27% Moderate (inductive), L 73% Low (inductive) **Associated Habitats:** C 52% Common, O 12% Occasional

	USFWS Sec7	# SO	# Obs	Predicted Model	Associated Habitat	Range
B - **Veery** *(Catharus fuscescens)* SOC		2	1			S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Delineation Criteria Observations with evidence of breeding activity buffered by a minimum distance of 300 meters in order to be conservative about encompassing home ranges and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Apr 14, 2022)
Predicted Models: M 19% Moderate (inductive), L 81% Low (inductive) **Associated Habitats:** C 2% Common

	USFWS Sec7	# SO	# Obs	Predicted Model	Associated Habitat	Range
I - **Bombus suckleyi** *(Suckley Cuckoo Bumble Bee)* SOC		1			Not Assigned	Y

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G2G3** State: **S1**

Delineation Criteria Confirmed breeding area based on the presence of a resident animal of any age. Point observation location is buffered by a minimum distance of 1700 meters in order to encompass the home range of the individual as well as adjacent habitat likely to support other individuals and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Jun 16, 2022)

Predicted Models: M 15% Moderate (inductive), L 85% Low (inductive)

V - Atriplex truncata *(Wedge-leaf Saltbush)* SOC 1 Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** MNPS: **4**

Delineation Criteria Individual occurrences are generally based upon a discretely mapped area provided by an observer and are not separated by any pre-defined distance. Individual clusters of plants mapped at fine spatial scales (separated by less than approximately 25-50 meters) may be grouped together into one occurrence if they are not separated by distinct areas of habitat or terrain features. Point observations are buffered to encompass any locational uncertainty associated with the observation. (Last Updated: Jan 29, 2021)

Predicted Models: M 15% Moderate (inductive), L 58% Low (inductive) **Associated Habitats:** C 2% Common

B - Lewis's Woodpecker *(Melanerpes lewis)* SOC 1 S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA; BCC10; BCC17** USFS: **Species of Conservation Concern in Forests (HLC)**
BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 300 meters in order to encompass the likely foraging area used by breeding adults around the nest tree and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Apr 13, 2022)

Predicted Models: M 14% Moderate (inductive), L 35% Low (inductive) **Associated Habitats:** C 3% Common, O 1% Occasional

B - Evening Grosbeak *(Coccothraustes vespertinus)* SOC 2 3 Y W M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 1,000 meters in order to encompass the maximum foraging distance from nests reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Apr 14, 2022)

Predicted Models: M 14% Moderate (inductive), L 20% Low (inductive) **Associated Habitats:** C 13% Common, O 1% Occasional

B - Great Blue Heron *(Ardea herodias)* SOC 9 8 Y S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3**

Delineation Criteria Confirmed nesting area buffered by a minimum distance of 6,500 meters in order to be conservative about encompassing the areas commonly used for foraging near the breeding colony and otherwise buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Dec 22, 2021)

Predicted Models: M 10% Moderate (inductive), L 60% Low (inductive) **Associated Habitats:** C 2% Common

V - Impatiens aurella *(Pale-yellow Jewel-weed)* SOC 1 1 Not Assigned Y

View in Field Guide **View Predicted Models** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3** MNPS: **3**

Predicted Models: M 7% Moderate (inductive), L 46% Low (inductive)

B - Green-tailed Towhee *(Pipilo chlorurus)* SOC 1 1 S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 125 meters in order to encompass the breeding home range size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Apr 15, 2022)

Predicted Models: M 1% Moderate (inductive), L 66% Low (inductive) **Associated Habitats:** C 52% Common, O 2% Occasional

V - Cypripedium parviflorum *(Small Yellow Lady's-slipper)* PSOC 1 Not Assigned Y

View in Field Guide **View Predicted Models** **View Range Maps**

Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFS: **Sensitive - Known in Forests (KOOT, LOLO)**
Sensitive - Suspected in Forests (BRT)
Species of Conservation Concern in Forests (CG, HLC) MNPS: **2**

Predicted Models: L 43% Low (inductive)

M - Grizzly Bear *(Ursus arctos)* SOC 7 1 Y H

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S2S3** USFWS: **PS: LT; XN** BLM: **THREATENED** FWP SWAP: **SGCN2-3**

Delineation Criteria Species Occurrence polygons represent areas delineated by the U.S. Fish and Wildlife Service (USFWS) that encompass both home ranges and potential transitory movements based on verified sightings. Within these areas, the USFWS wants project proponents to consider whether the species â€œmay be presentâ€ when evaluating the potential impacts of a project and to work with the USFWS to develop and implement best management practices to minimize or eliminate project effects on the species. (Last Updated: Jan 25, 2022)

Predicted Models: L 27% Low (inductive) **Associated Habitats:** C 51% Common, O 3% Occasional

B - Brewer's Sparrow *(Spizella breweri)* SOC 1 S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Delineation Criteria Confirmed breeding area based on the presence of a nest, chicks, or territorial adults during the breeding season. Point observation location is buffered by a minimum distance of 100 meters in order to encompass the maximum territory size reported for the species and otherwise is buffered by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Apr 14, 2022)

Predicted Models: L 7% Low (inductive) **Associated Habitats:** C 3% Common

O - Bat Roost (Non-Cave) *(Bat Roost (Non-Cave))* IAH 1 Not Available Not Assigned

View in Field Guide

Important Animal Habitat - Native Species Global: **GNR** State: **SNR**

Delineation Criteria Confirmed area of occupancy based on the documented presence of adults or juveniles of any bat species at non-cave natural roost sites (e.g. rock outcrops, trees), below ground human created roost sites (e.g. mines), and above ground human created roost sites (e.g., bridges, buildings). Point observation locations are buffered by a distance of 4,500 meters in order to encompass the 95% confidence interval for nightly foraging distance reported for Townsendâ€™s Big-eared Bat (a resident Montana bat Species of Concern) and otherwise by the locational uncertainty associated with the observation up to a maximum distance of 10,000 meters. (Last Updated: Oct 22, 2019)

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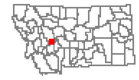
Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
N Suitable (native range)	C Common	Y Native / Year-round	Count of obs with 'good precision' (<=1000m)
O Optimal Suitability	O Occasional	S Summer	+ indicates additional 'poor precision' obs (1001m-10,000m)
M Moderate Suitability		W Winter	
L Low Suitability		M Migratory	
I Suitable (introduced range)		N Non-native	
		H Historic	



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46.55718	-111.91459
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Native Species

Summarized by: **010N003W035** *(Buffered PLSS Section)*
All Species (not filtered by Status)

Other Observed Species

USFWS Sec7 | # Obs | Predicted Model | Associated Habitat | Range

B - American White Pelican *(Pelecanus erythrorhynchos)* SOC — # Obs: 2 — Range: S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: O 15% Optimal (inductive), M 70% Moderate (inductive), L 15% Low (inductive) **Associated Habitats:** C 1% Common

B - Hooded Merganser *(Lophodytes cucullatus)* PSOC — # Obs: 5 — Range: Y M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**
Predicted Models: O 6% Optimal (inductive), M 51% Moderate (inductive), L 39% Low (inductive) **Associated Habitats:** C 3% Common

B - Broad-tailed Hummingbird *(Selasphorus platycercus)* PSOC — # Obs: 1 — Range: S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA; BCC10** FWP SWAP: **SGIN**
Predicted Models: O 6% Optimal (inductive), M 38% Moderate (inductive), L 51% Low (inductive) **Associated Habitats:** C 12% Common, O 50% Occasional

B - White-faced Ibis *(Plegadis chihi)* SOC — # Obs: 1 — Range: S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: M 24% Moderate (inductive), L 35% Low (inductive) **Associated Habitats:** C 3% Common

B - Cassin's Finch *(Haemorhous cassinii)* SOC — # Obs: 9 — Range: Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 1% Moderate (inductive), L 32% Low (inductive) **Associated Habitats:** C 3% Common

B - Clark's Nutcracker *(Nucifraga columbiana)* SOC — # Obs: 9 — Range: Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** USFS: **Species of Conservation Concern in Forests (FLAT)** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 1% Moderate (inductive), L 19% Low (inductive) **Associated Habitats:** C 3% Common

A - Western Toad *(Anaxyrus boreas)* SOC — # Obs: 1 — Range: Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN2**
Predicted Models: L 81% Low (inductive) **Associated Habitats:** C 5% Common, O 56% Occasional

B - Black-necked Stilt *(Himantopus mexicanus)* SOC — # Obs: 1 — Range: S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 48% Low (inductive) **Associated Habitats:** C 1% Common, O 2% Occasional

M - Black-tailed Prairie Dog *(Cynomys ludovicianus)* SOC — # Obs: 1 — Range: Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: L 44% Low (inductive) **Associated Habitats:** C 2% Common, O 73% Occasional

B - Pileated Woodpecker *(Dryocopus pileatus)* SOC — # Obs: 2 — Range: Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 1% Low (inductive) **Associated Habitats:** C 3% Common

B - Northern Goshawk *(Accipiter gentilis)* SOC — # Obs: 1 — Range: Y WM

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 1% Low (inductive) **Associated Habitats:** C 1% Common, O 2% Occasional

B - Peregrine Falcon *(Falco peregrinus)* SOC — # Obs: 1 — Predicted Model: Not Available — Range: Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE**
FWP SWAP: **SGCN3** PIF: **2**
Associated Habitats: C 51% Common, O 1% Occasional

B - Franklin's Gull *(Leucophaeus pipixcan)* SOC — # Obs: 1 — Predicted Model: Not Available — Range: S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Associated Habitats: C 1% Common, O 18% Occasional

I - Margaritifera falcata *(Western Pearlshell)* SOC — # Obs: 1 — Predicted Model: Not Available — Associated Habitat: Not Assigned — Range: Y

View in Field Guide   **View Range Maps**

Species of Concern - Native Species   Global: **G5**   State: **S2**   USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** **Species of Conservation Concern in Forests (CG, HLC)**   BLM: **SENSITIVE**   FWP SWAP: **SGCN2**

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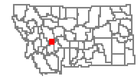
L Low Suitability		M Migratory	
I Suitable (introduced range)		N Non-native	
		H Historic	



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Native Species

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All Species (not filtered by Status)

Other Potential Species

	USFWS Sec7	Predicted Model	Associated Habitat	Range
V - Oxytropis lagopus var. conjugans *(Hare's-foot Locoweed)* PSOC			Not Assigned	Y

View in Field Guide **View Predicted Models** **View Range Maps**
Potential Species of Concern - Native Species Global: **G4G5T3T4** State: **S3S4** MNPS: **3**
Predicted Models: O 54% Optimal (inductive), M 45% Moderate (inductive), L 1% Low (inductive)

B - Yellow-billed Cuckoo *(Coccyzus americanus)* SOC — S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **PS: LT; MBTA** BLM: **THREATENED** FWP SWAP: **SGCN3, SGIN** PIF: **2**
Predicted Models: O 23% Optimal (inductive), M 44% Moderate (inductive), L 32% Low (inductive) **Associated Habitats:** C 2% Common

V - Dichanthelium acuminatum *(Panic Grass)* SOC — Not Assigned — Y

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2S3** MNPS: **2**
Predicted Models: O 6% Optimal (inductive), M 47% Moderate (inductive), L 47% Low (inductive)

B - Common Poorwill *(Phalaenoptilus nuttallii)* PSOC — S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**
Predicted Models: O 1% Optimal (inductive), M 11% Moderate (inductive), L 60% Low (inductive) **Associated Habitats:** C 51% Common, O 25% Occasional

B - Long-billed Curlew *(Numenius americanus)* SOC — S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: M 82% Moderate (inductive), L 18% Low (inductive) **Associated Habitats:** C 47% Common, O 4% Occasional

M - North American Porcupine *(Erethizon dorsatum)* PSOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** FWP SWAP: **SGIN**
Predicted Models: M 78% Moderate (inductive), L 22% Low (inductive) **Associated Habitats:** C 62% Common

M - Western Spotted Skunk *(Spilogale gracilis)* PSOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **SNR** FWP SWAP: **SGIN**
Predicted Models: M 57% Moderate (inductive), L 43% Low (inductive) **Associated Habitats:** C 53% Common, O 9% Occasional

B - Short-eared Owl *(Asio flammeus)* PSOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA; BCC11; BCC17** PIF: **3**
Predicted Models: M 55% Moderate (inductive), L 31% Low (inductive) **Associated Habitats:** C 68% Common, O 6% Occasional

M - Little Brown Myotis *(Myotis lucifugus)* SOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G3G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 50% Moderate (inductive), L 50% Low (inductive) **Associated Habitats:** C 62% Common, O 38% Occasional

V - Potentilla plattensis *(Platte Cinquefoil)* SOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** MNPS: **4**
Predicted Models: M 41% Moderate (inductive), L 59% Low (inductive) **Associated Habitats:** C 1% Common

B - Rufous Hummingbird *(Selasphorus rufus)* PSOC — S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G4** State: **S4B** USFWS: **MBTA; BCC10** PIF: **3**
Predicted Models: M 34% Moderate (inductive), L 50% Low (inductive) **Associated Habitats:** C 60% Common, O 1% Occasional

M - Silver-haired Bat *(Lasionycteris noctivagans)* PSOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G3G4** State: **S4**
Predicted Models: M 32% Moderate (inductive), L 68% Low (inductive) **Associated Habitats:** C 54% Common, O 34% Occasional

M - Preble's Shrew *(Sorex preblei)* SOC — Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** FWP SWAP: **SGCN3**
Predicted Models: M 30% Moderate (inductive), L 59% Low (inductive) **Associated Habitats:** C 59% Common, O 1% Occasional

B - Loggerhead Shrike *(Lanius ludovicianus)* SOC — S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: M 30% Moderate (inductive), L 55% Low (inductive) **Associated Habitats:** C 58% Common, O 17% Occasional

⊟ **M - Fringed Myotis** *(Myotis thysanodes)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: M 27% Moderate (inductive), L 63% Low (inductive) **Associated Habitats:** C 54% Common, O 18% Occasional

⊟ **V - Carex crawei** *(Crawe's Sedge)* SOC Not Assigned Y

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2S3** MNPS: **3**
Predicted Models: M 26% Moderate (inductive), L 67% Low (inductive)

⊟ **V - Eleocharis rostellata** *(Beaked Spikerush)* SOC Not Assigned Y

View in Field Guide **View Predicted Models** **View Range Maps**
USFS: **Sensitive - Known in Forests (BD)**
Species of Concern - Native Species Global: **G5** State: **S3** **Species of Conservation Concern in Forests (CG, FLAT, HLC)** MNPS: **2**
Predicted Models: M 26% Moderate (inductive), L 52% Low (inductive)

⊟ **V - Erigeron linearis** *(Linear-leaf Fleabane)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2** MNPS: **2**
Predicted Models: M 22% Moderate (inductive), L 68% Low (inductive) **Associated Habitats:** C 47% Common

⊟ **B - Ferruginous Hawk** *(Buteo regalis)* SOC S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: M 20% Moderate (inductive), L 80% Low (inductive) **Associated Habitats:** C 50% Common, O 1% Occasional

⊟ **M - Dwarf Shrew** *(Sorex nanus)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S2S3** FWP SWAP: **SGCN2-3**
Predicted Models: M 16% Moderate (inductive), L 73% Low (inductive) **Associated Habitats:** C 3% Common, O 51% Occasional

⊟ **V - Draba densifolia** *(Dense-leaf Draba)* SOC Not Assigned Y

View in Field Guide **View Predicted Models** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Species of Conservation Concern in Forests (CG, HLC)** MNPS: **2**
Predicted Models: M 16% Moderate (inductive), L 3% Low (inductive)

⊟ **M - Long-legged Myotis** *(Myotis volans)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4G5** State: **S3**
Predicted Models: M 13% Moderate (inductive), L 87% Low (inductive) **Associated Habitats:** C 54% Common, O 18% Occasional

⊟ **B - Western Screech-Owl** *(Megascops kennicottii)* PSOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G4G5** State: **S3S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**
Predicted Models: M 13% Moderate (inductive), L 34% Low (inductive) **Associated Habitats:** C 50% Common

⊟ **B - Bald Eagle** *(Haliaeetus leucocephalus)* SSS Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Special Status Species - Native Species Global: **G5** State: **S4** USFWS: **BGEPA; MBTA** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE** PIF: **2**
Predicted Models: M 12% Moderate (inductive), L 38% Low (inductive) **Associated Habitats:** C 4% Common, O 47% Occasional

⊟ **M - North American Water Vole** *(Microtus richardsoni)* PSOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4**
Predicted Models: M 9% Moderate (inductive), L 20% Low (inductive) **Associated Habitats:** C 1% Common, O 1% Occasional

⊟ **B - Sage Thrasher** *(Oreoscoptes montanus)* SOC S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: M 8% Moderate (inductive), L 56% Low (inductive) **Associated Habitats:** C 3% Common

⊟ **M - Long-eared Myotis** *(Myotis evotis)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3**
Predicted Models: M 7% Moderate (inductive), L 93% Low (inductive) **Associated Habitats:** C 54% Common, O 19% Occasional

⊟ **B - Barrow's Goldeneye** *(Bucephala islandica)* PSOC Y W M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Potential Species of Concern - Native Species Global: **G5** State: **S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **2**
Predicted Models: M 6% Moderate (inductive), L 89% Low (inductive) **Associated Habitats:** C 3% Common

⊟ **B - Caspian Tern** *(Hydroprogne caspia)* SOC S M

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S2B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **2**
Predicted Models: M 6% Moderate (inductive), L 22% Low (inductive) **Associated Habitats:** C 1% Common, O 2% Occasional

⊟ **R - Greater Short-horned Lizard** *(Phrynosoma hernandesi)* SOC Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN**
Predicted Models: M 1% Moderate (inductive), L 99% Low (inductive) **Associated Habitats:** C 49% Common, O 1% Occasional

⊟ **M - Canada Lynx** *(Lynx canadensis)* SOC 7 Y

View in Field Guide **View Predicted Models** **View Associated Habitat** **View Range Maps**
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **LT; CH** BLM: **THREATENED** FWP SWAP: **SGCN3**
Predicted Models: M 1% Moderate (inductive), L 85% Low (inductive) **Associated Habitats:** C 2% Common, O 1% Occasional

B - Ovenbird *(Seiurus aurocapilla)* PSOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA** PIF: **3**
Predicted Models: M 1% Moderate (inductive), L 33% Low (inductive) **Associated Habitats:** C 2% Common

M - Townsend's Big-eared Bat *(Corynorhinus townsendii)* SOC Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: M 1% Moderate (inductive), L 15% Low (inductive) **Associated Habitats:** C 54% Common, O 9% Occasional

B - Sharp-tailed Grouse *(Tympanuchus phasianellus)* SOC Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **SX,S4** FWP SWAP: **SGCN1** PIF: **2**
Predicted Models: L 100% Low (inductive) **Associated Habitats:** C 51% Common, O 18% Occasional

B - Pinyon Jay *(Gymnorhinus cyanocephalus)* SOC Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S3** USFWS: **MBTA; BCC10; BCC17** FWP SWAP: **SGCN3**
Predicted Models: L 89% Low (inductive) **Associated Habitats:** C 3% Common, O 9% Occasional

B - Sprague's Pipit *(Anthus spragueii)* SOC 7 S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 86% Low (inductive) **Associated Habitats:** O 48% Occasional

B - Black-billed Cuckoo *(Coccyzus erythropthalmus)* SOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **2**
Predicted Models: L 84% Low (inductive) **Associated Habitats:** C 3% Common

B - Trumpeter Swan *(Cygnus buccinator)* SOC Y M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (BD)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 59% Low (inductive) **Associated Habitats:** C 3% Common

V - Elodea bifoliata *(Long-sheath Waterweed)* SOC Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4G5** State: **S2?** MNPS: **3**
Predicted Models: L 56% Low (inductive) **Associated Habitats:** C 1% Common

B - Thick-billed Longspur *(Rhynchophanes mccownii)* SOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 54% Low (inductive) **Associated Habitats:** O 72% Occasional

B - Greater Sage-Grouse *(Centrocercus urophasianus)* SOC Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3G4** State: **S2** USFS: **Sensitive - Known in Forests (BD)** **Species of Conservation Concern in Forests (CG)** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **1**
Predicted Models: L 34% Low (inductive) **Associated Habitats:** C 3% Common

B - Common Tern *(Sterna hirundo)* SOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Predicted Models: L 25% Low (inductive) **Associated Habitats:** C 3% Common

B - Bobolink *(Dolichonyx oryzivorus)* SOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 23% Low (inductive) **Associated Habitats:** C 72% Common, O 1% Occasional

V - Stellaria crassifolia *(Fleshy Stitchwort)* SOC Not Assigned Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** MNPS: **3**
Predicted Models: L 22% Low (inductive)

B - Meesia triquetra *(Meesia Moss)* SOC Not Assigned Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Sensitive - Known in Forests (BRT, KOOT)** **Sensitive - Suspected in Forests (LOLO)** **Species of Conservation Concern in Forests (CG, FLAT)**
Predicted Models: L 21% Low (inductive)

B - Harlequin Duck *(Histrionicus histrionicus)* SOC S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2B** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (BD, KOOT, LOLO)** FWP SWAP: **SGCN2** PIF: **1**
Predicted Models: L 18% Low (inductive) **Associated Habitats:** C 2% Common, O 1% Occasional

V - Adoxa moschatellina *(Musk-root)* SOC Not Assigned Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known in Forests (BD, LOLO)** **Species of Conservation Concern in Forests (CG, HLC)** MNPS: **3**
Predicted Models: L 16% Low (inductive)

V - Stipa lettermanii *(Letterman's Needlegrass)* SOC Not Assigned Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S3** USFS: **Species of Conservation Concern in Forests (HLC)** MNPS: **3**
Predicted Models: L 11% Low (inductive)

I - **Rhyacophila betteni** *(A Caddisfly)* PSOC — Not Assigned — Y

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G2G4** State: **S3S4**
Predicted Models: L 8% Low (inductive)

B - **Golden Eagle** *(Aquila chrysaetos)* SOC — Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **BGEPA; MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Predicted Models: L 6% Low (inductive) **Associated Habitats:** C 53% Common, O 16% Occasional

B - **American Bittern** *(Botaurus lentiginosus)* SOC — S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **3**
Predicted Models: L 3% Low (inductive) **Associated Habitats:** C 2% Common

V - **Primula incana** *(Mealy Primrose)* SOC — Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Sensitive - Known in Forests (BD)** MNPS: **2**
Predicted Models: L 2% Low (inductive) **Associated Habitats:** C 1% Common

V - **Lobelia kalmii** *(Kalm's Lobelia)* SOC — Not Assigned — Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** MNPS: **3**
Predicted Models: L 2% Low (inductive)

B - **Burrowing Owl** *(Athene cunicularia)* SOC — S M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Predicted Models: L 1% Low (inductive) **Associated Habitats:** C 3% Common, O 51% Occasional

B - **Great Gray Owl** *(Strix nebulosa)* SOC — Y

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3, SGIN** PIF: **3**
Predicted Models: L 1% Low (inductive) **Associated Habitats:** C 2% Common, O 1% Occasional

B - **Gray-crowned Rosy-Finch** *(Leucosticte tephrocotis)* SOC — Y W M

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2** USFWS: **MBTA** FWP SWAP: **SGCN2, SGIN**
Predicted Models: L 1% Low (inductive) **Associated Habitats:** C 1% Common

V - **Epipactis gigantea** *(Giant Helleborine)* SOC — Not Assigned — Y

View in Field Guide View Predicted Models View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2S3** USFS: **Sensitive - Known in Forests (BD, LOLO)**
Sensitive - Suspected in Forests (BRT, KOOT)
Species of Conservation Concern in Forests (FLAT, HLC) MNPS: **2**
Predicted Models: L 1% Low (inductive)

V - **Mimulus suksdorfii** *(Suksdorf Monkeyflower)* PSOC — Not Assigned — Y

View in Field Guide View Predicted Models View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S3S4**
Predicted Models: L 1% Low (inductive)

M - **Bison** *(Bos bison)* SOC — Not Available — H

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S2** FWP SWAP: **SGCN2**
Associated Habitats: C 51% Common, O 1% Occasional

V - **Eriogonum caespitosum** *(Mat Buckwheat)* SOC — Not Available — Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2S3** MNPS: **3**
Associated Habitats: C 47% Common

V - **Polygonum austiniae** *(Austin's Knotweed)* PSOC — Not Available — Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5T4** State: **S3S4** USFS: **Sensitive - Known in Forests (BD)**
Species of Conservation Concern in Forests (HLC) MNPS: **2**
Associated Habitats: C 47% Common

B - **Pacific Wren** *(Troglodytes pacificus)* SOC — Not Available — Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **2**
Associated Habitats: C 3% Common, O 1% Occasional

B - **Varied Thrush** *(Ixoreus naevius)* SOC — Not Available — S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Associated Habitats: C 3% Common, O 1% Occasional

B - **Black-backed Woodpecker** *(Picoides arcticus)* SOC — Not Available — Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE**
FWP SWAP: **SGCN3** PIF: **1**
Associated Habitats: C 3% Common

B - Brown Creeper *(Certhia americana)* SOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **1**
Associated Habitats: C 3% Common

I - Argia alberta *(Paiute Dancer)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G4** State: **S2S3**
Associated Habitats: O 3% Occasional

I - Polygonia progne *(Gray Comma)* SOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S2**
Associated Habitats: C 3% Common

B - Black-crowned Night-Heron *(Nycticorax nycticorax)* SOC Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3** PIF: **3**
Associated Habitats: C 3% Common

I - Euphydryas gillettii *(Gillette's Checkerspot)* SOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S2**
Associated Habitats: C 2% Common, O 47% Occasional

B - Mountain Plover *(Charadrius montanus)* SOC Not Available S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S2B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN2** PIF: **1**
Associated Habitats: C 2% Common, O 47% Occasional

B - Northern Hawk Owl *(Surnia ulula)* SOC Not Available W M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3** USFWS: **MBTA** FWP SWAP: **SGCN3, SGIN**
Associated Habitats: C 2% Common, O 1% Occasional

V - Senecio eremophilus *(Desert Groundsel)* SOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1S2** MNPS: **3**
Associated Habitats: C 2% Common

B - Alder Flycatcher *(Empidonax alnorum)* SOC Not Available M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** FWP SWAP: **SGCN3**
Associated Habitats: C 2% Common

B - Tennessee Warbler *(Leiothlypis peregrina)* PSOC Not Available M

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4B** USFWS: **MBTA**
Associated Habitats: C 2% Common

M - Black-footed Ferret *(Mustela nigripes)* SOC Not Available H

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G1** State: **S1** USFWS: **LE; XN** BLM: **ENDANGERED** FWP SWAP: **SGCN1**
Associated Habitats: C 2% Common

B - Black-and-white Warbler *(Mniotilta varia)* PSOC Not Available M

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S4B** USFWS: **MBTA**
Associated Habitats: C 1% Common, O 6% Occasional

M - Wolverine *(Gulo gulo)* SOC 7 Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO)** BLM: **SENSITIVE** FWP SWAP: **SGCN3**
Associated Habitats: C 1% Common, O 3% Occasional

I - Argia vivida *(Vivid Dancer)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
Associated Habitats: C 1% Common, O 3% Occasional

B - Boreal Owl *(Aegolius funereus)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4** USFWS: **MBTA** FWP SWAP: **SGIN** PIF: **3**
Associated Habitats: C 1% Common, O 2% Occasional

I - Colias gigantea *(Giant Sulphur)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3**
Associated Habitats: C 1% Common, O 2% Occasional

I - Libellula saturata *(Flame Skimmer)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
Associated Habitats: C 1% Common, O 2% Occasional

I - Somatochlora minor *(Ocellated Emerald)* PSOC Not Available Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
Associated Habitats: C 1% Common, O 2% Occasional

B - Flammulated Owl *(Psiloscops flammeolus)* SOC | Not Available | S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4** State: **S3B** USFWS: **MBTA; BCC10** USFS: **Sensitive - Known in Forests (BD, BRT, KOOT, LOLO) Species of Conservation Concern in Forests (FLAT, HLC)** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **1**
Associated Habitats: C 1% Common, O 2% Occasional

B - Forster's Tern *(Sterna forsteri)* SOC | Not Available | S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Associated Habitats: C 1% Common, O 2% Occasional

I - Aeshna juncea *(Sedge Darner)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
Associated Habitats: C 1% Common, O 1% Occasional

I - Aeshna sitchensis *(Zigzag Darner)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
Associated Habitats: C 1% Common, O 1% Occasional

I - Enallagma clausum *(Alkali Bluet)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
Associated Habitats: C 1% Common, O 1% Occasional

I - Leucorrhinia borealis *(Boreal Whiteface)* SOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G5** State: **S1**
Associated Habitats: C 1% Common, O 1% Occasional

I - Rhionaeschna californica *(California Darner)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
Associated Habitats: C 1% Common, O 1% Occasional

I - Somatochlora hudsonica *(Hudsonian Emerald)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
Associated Habitats: C 1% Common, O 1% Occasional

I - Sympetrum madidum *(Red-veined Meadowhawk)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S3**
Associated Habitats: C 1% Common, O 1% Occasional

B - Black Tern *(Chlidonias niger)* SOC | Not Available | S M

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G4G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11; BCC17** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**
Associated Habitats: C 1% Common, O 1% Occasional

I - Aeshna constricta *(Lance-tipped Darner)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S1S3**
Associated Habitats: C 1% Common

I - Aeshna eremita *(Lake Darner)* PSOC | Not Available | Y S W

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S4**
Associated Habitats: C 1% Common

I - Argia emma *(Emma's Dancer)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
Associated Habitats: C 1% Common

I - Rhionaeschna multicolor *(Blue-eyed Darner)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S2S4**
Associated Habitats: C 1% Common

I - Somatochlora semicircularis *(Mountain Emerald)* PSOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Potential Species of Concern - Native Species Global: **G5** State: **S3S5**
Associated Habitats: C 1% Common

V - Botrychium ascendens *(Upward-lobed Moonwort)* SOC | Not Available | Y

View in Field Guide View Associated Habitat View Range Maps
Species of Concern - Native Species Global: **G3** State: **S3** USFS: **Sensitive - Known in Forests (KOOT)** MNPS: **4**
Associated Habitats: C 1% Common

V - Botrychium crenulatum *(Wavy Moonwort)* SOC | Not Available | Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, KOOT, LOLO)** **Species of Conservation Concern in Forests (HLC)** MNPS: **4**

Associated Habitats: C 1% Common

V - Botrychium paradoxum *(Peculiar Moonwort)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G3G4** State: **S3** USFS: **Sensitive - Known in Forests (BD, KOOT)** **Sensitive - Suspected in Forests (LOLO)** **Species of Conservation Concern in Forests (CG, FLAT, HLC)** BLM: **SENSITIVE** MNPS: **4**

Associated Habitats: C 1% Common

V - Botrychium simplex *(Least Moonwort)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S2** MNPS: **4**

Associated Habitats: C 1% Common

V - Braya humilis *(Low Braya)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S2** USFS: **Species of Conservation Concern in Forests (HLC)** MNPS: **3**

Associated Habitats: C 1% Common

V - Hornungia procumbens *(Hutchinsia)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S2** MNPS: **3**

Associated Habitats: C 1% Common

V - Kobresia simpliciuscula *(Simple Kobresia)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** MNPS: **3**

Associated Habitats: C 1% Common

V - Ranunculus pedatifidus *(Northern Buttercup)* SOC Not Available Y

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3** USFS: **Species of Conservation Concern in Forests (HLC)** MNPS: **3**

Associated Habitats: C 1% Common

B - Black Rosy-Finch *(Leucosticte atrata)* SOC Not Available S M

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G4** State: **S2** USFWS: **MBTA; BCC10** FWP SWAP: **SGCN2, SGIN** PIF: **2**

Associated Habitats: C 1% Common

B - Clark's Grebe *(Aechmophorus clarkii)* SOC Not Available M

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA; BCC10; BCC11** FWP SWAP: **SGCN3** PIF: **3**

Associated Habitats: C 1% Common

B - Common Loon *(Gavia immer)* SOC Not Available M

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** USFS: **Sensitive - Known in Forests (KOOT, LOLO)** FWP SWAP: **SGCN3** PIF: **1**

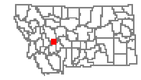
Associated Habitats: C 1% Common

B - Horned Grebe *(Podiceps auritus)* SOC Not Available M

View in Field Guide **View Associated Habitat** **View Range Maps**

Species of Concern - Native Species Global: **G5** State: **S3B** USFWS: **MBTA** BLM: **SENSITIVE** FWP SWAP: **SGCN3** PIF: **2**

Associated Habitats: C 1% Common



Latitude	Longitude
46.55718	-111.91459
46.60343	-111.97782

Structured Surveys

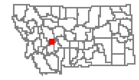
Summarized by: **010N003W035** *(Buffered PLSS Section)*

The Montana Natural Heritage Program (MTNHP) records information on the locations where more than 80 different types of well-defined repeatable survey protocols capable of detecting an animal species or suite of animal species have been conducted by state, federal, tribal, university, or private consulting biologists. Examples of structured survey protocols tracked by MTNHP include: visual encounter and dip net surveys for pond breeding amphibians, point counts for birds, call playback surveys for selected bird species, visual surveys of migrating raptors, kick net stream reach surveys for macroinvertebrates, visual encounter cover object surveys for terrestrial mollusks, bat acoustic or mist net surveys, pitfall and/or snap trap surveys for small terrestrial mammals, track or camera trap surveys for large mammals, and trap surveys for turtles. Whenever possible, photographs of survey locations are stored in MTNHP databases.

MTNHP does not typically manage information on structured surveys for plants; surveys for invasive species may be a future exception.

Within the report area you have requested, structured surveys are summarized by the number of each type of structured survey protocol that has been conducted, the number of species detections/observations resulting from these surveys, and the most recent year a survey has been conducted.

E-Noxious Weed, Road-based *(Noxious Weed Road-based Visual Surveys)*	**Survey Count**: 18	**Obs Count**: 41	**Recent Survey**: 2004
F-Fish Electrofishing *(Fish Electrofishing Surveys)*	**Survey Count**: 4	**Obs Count**: 5	**Recent Survey**: 2010
F-Fish Trapping/Netting *(Fish Trapping or Netting Surveys)*	**Survey Count**: 3	**Obs Count**: 7	**Recent Survey**: 2010
I-Mussel *(Stream Mussel Survey)*	**Survey Count**: 4	**Obs Count**: 1	**Recent Survey**: 2011



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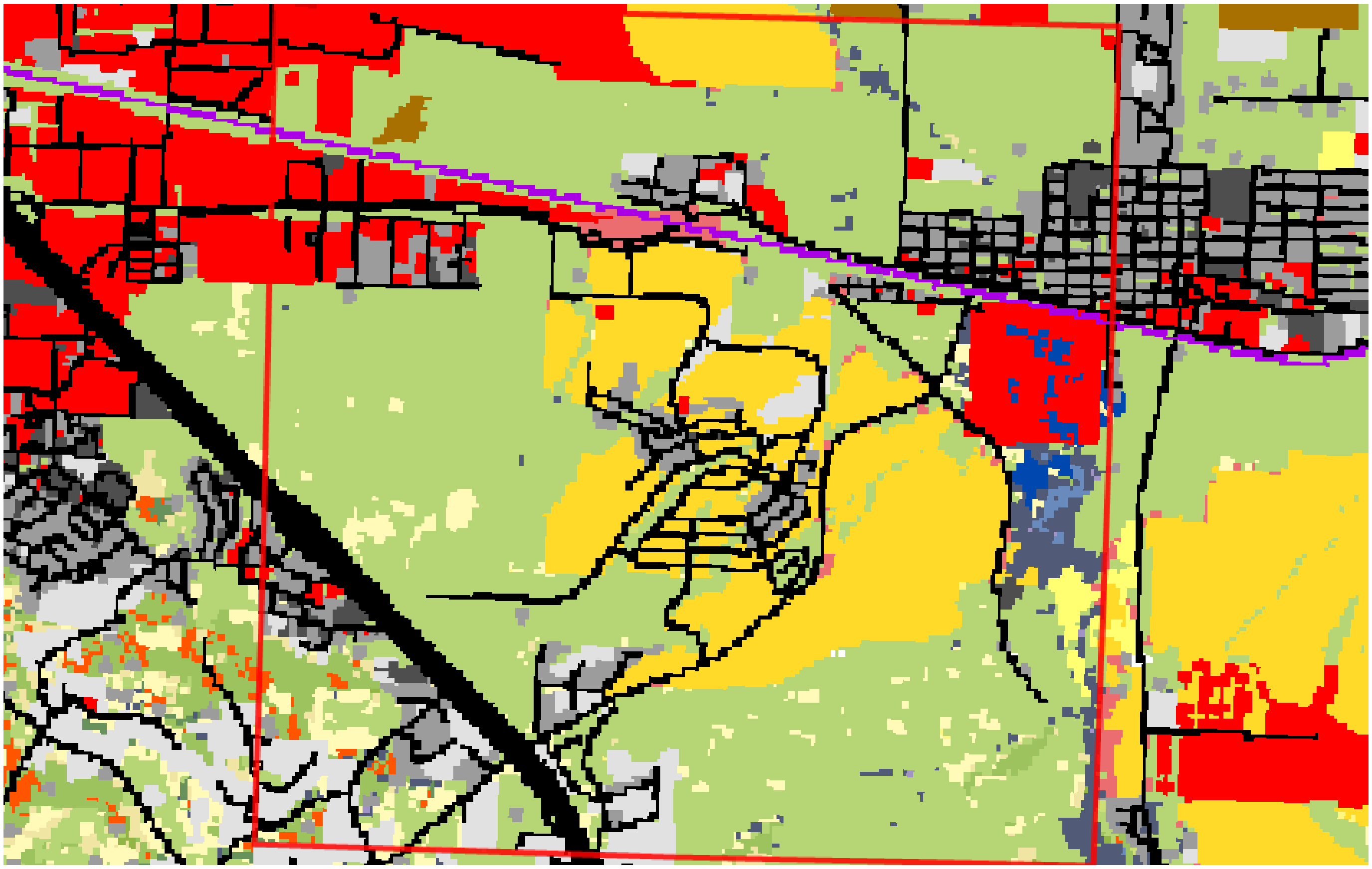
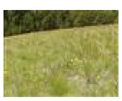
Land Cover

Summarized by: **010N003W035** *(Buffered PLSS Section)*



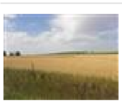


47% (*2,757 Acres*)

Grassland Systems
Montane Grassland

Rocky Mountain Lower Montane, Foothill, and Valley Grassland

This grassland system of the northern Rocky Mountains is found at lower montane to foothill elevations in mountains and valleys throughout Montana. These grasslands are floristically similar to Big Sagebrush Steppe but are defined by shorter summers, colder winters, and young soils derived from recent glacial and alluvial material. They are found at elevations from 548 - 1,650 meters (1,800-5,413 feet). In the lower montane zone, they range from small meadows to large open parks surrounded by conifers; below the lower treeline, they occur as extensive foothill and valley grasslands. Soils are relatively deep, fine-textured, often with coarse fragments, and non-saline. Microphytic crust may be present in high-quality occurrences. This system is typified by cool-season perennial bunch grasses and forbs (>25%) cover, with a sparse shrub cover (<10%). Rough fescue (*Festuca campestris*) is dominant in the northwestern portion of the state and Idaho fescue (*Festuca idahoensis*) is dominant or co-dominant throughout the range of the system. Bluebunch wheatgrass (*Pseudoroegneria spicata*) occurs as a co-dominant throughout the range as well, especially on xeric sites. Western wheatgrass (*Pascopyrum smithii*) is consistently present, often with appreciable coverage (>10%) in lower elevation occurrences in western Montana and virtually always present, with relatively high coverages (>25%), on the edge of the Northwestern Great Plains region. Species diversity ranges from a high of more than 50 per 400 square meter plot on mesic sites to 15 (or fewer) on xeric and disturbed sites. Most occurrences have at least 25 vascular species present. Farmland conversion, noxious species invasion, fire suppression, heavy grazing and oil and gas development are major threats to this system.



15% (*907 Acres*)

Human Land Use
Agriculture

Cultivated Crops

These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.

No Image

9% (*522 Acres*)

Human Land Use
Developed

Other Roads

County, city and or rural roads generally open to motor vehicles.

No Image

8% (*453 Acres*)

Human Land Use
Developed

Commercial / Industrial

Businesses, industrial parks, hospitals, airports; utilities in commercial/industrial areas.

5% (*285* Acres)

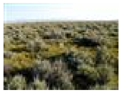
Human Land Use
Developed
Low Intensity Residential

Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units in rural and suburban areas. Paved roadways may be classified into this category.

4% (*218* Acres)

Human Land Use
Developed
Developed, Open Space

Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. This category often includes highway and railway rights of way and graveled rural roads.



2% (*130* Acres)

Shrubland, Steppe and Savanna Systems
Sagebrush Steppe
Big Sagebrush Steppe

This widespread ecological system occurs throughout much of central Montana, and north and east onto the western fringe of the Great Plains. In central Montana, where this system occurs on both glaciated and non-glaciated landscapes, it differs slightly, with more summer rain than winter precipitation and more precipitation annually. Throughout its distribution, soils are typically deep and non-saline, often with a microphytic crust. This shrub-steppe is dominated by perennial grasses and forbs with greater than 25% cover. Overall shrub cover is less than 10 percent. In Montana and Wyoming, stands are more mesic, with more biomass of grass, and have less shrub diversity than stands farther to the west, and 50 to 90% of the occurrences are dominated by Wyoming big sagebrush with western wheatgrass (*Pascopyrum smithii*). Japanese brome (*Bromus japonicus*) and cheatgrass (*Bromus tectorum*) are indicators of disturbance, but cheatgrassis typically not as abundant as in the Intermountain West, possibly due to a colder climate. The natural fire regime of this ecological system maintains a patchy distribution of shrubs, preserving the steppe character. Shrubs may increase following heavy grazing and/or with fire suppression. In central and eastern Montana, complexes of prairie dog towns are common in this ecological system.

2% (*115* Acres)

Wetland and Riparian Systems
Floodplain and Riparian
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland

This ecological system is found throughout the Rocky Mountain and Colorado Plateau regions. In Montana, sites occur at elevations of 609-1,219 meters (2,000-4,000 feet) west of the Continental Divide. East of the Continental Divide, this system ranges up to 1,676 meters (5,500 feet). It generally comprises a mosaic of multiple communities that are tree-dominated with a diverse shrub component. It is dependent on a natural hydrologic regime with annual to episodic flooding, so it is usually found within the flood zone of rivers, on islands, sand or cobble bars, and along streambanks. It can form large, wide occurrences on mid-channel islands in larger rivers, or narrow bands on small, rocky canyon tributaries and well-drained benches. It is also typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains, swales and irrigation ditches. In some locations, occurrences extend into moderately high intermountain basins where the adjacent vegetation is sage steppe. Black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) is the key indicator species. Other dominant trees may include boxelder maple (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), eastern cottonwood (*Populus deltoides*), Douglas-fir (*Pseudotsuga menziesii*), peachleaf willow (*Salix amygdaloides*), or Rocky Mountain juniper (*Juniperus scopulorum*). Dominant shrubs include Rocky Mountain maple (*Acer glabrum*), thinleaf alder (*Alnus incana*), river birch (*Betula occidentalis*), redoiser dogwood (*Cornus sericea*), hawthorne (*Crataegus* species), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), willows (*Salix* species), rose (*Rosa* species), silver buffaloberry (*Shepherdia argentea*), or snowberry (*Symphoricarpos* species).

No Image

2% (*104* Acres)

Human Land Use
Developed
Interstate

National Highway System (NHS) limited access highways and their shoulders and rights of way.

Additional Limited Land Cover

- 1% (*71 Acres*) Rocky Mountain Ponderosa Pine Woodland and Savanna
- 1% (*51 Acres*) Major Roads
- 1% (*49 Acres*) High Intensity Residential
- 1% (*44 Acres*) Railroad
- 1% (*37 Acres*) Introduced Upland Vegetation - Annual and Biennial Forbland
- 1% (*33 Acres*) Open Water
- <1% (*22 Acres*) Pasture/Hay
- <1% (*17 Acres*) Montane Sagebrush Steppe
- <1% (*12 Acres*) Insect-Killed Forest
- <1% (*12 Acres*) Quarries, Strip Mines and Gravel Pits
- <1% (*9 Acres*) Emergent Marsh
- <1% (*2 Acres*) Alpine-Montane Wet Meadow
- <1% (*2 Acres*) Rocky Mountain Foothill Limber Pine - Juniper Woodland
- <1% (*2 Acres*) Low Sagebrush Shrubland
- <1% (*1 Acres*) Rocky Mountain Subalpine-Montane Mesic Meadow
- <1% (*1 Acres*) Rocky Mountain Montane-Foothill Deciduous Shrubland

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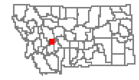

Latitude	Longitude
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Wetland and Riparian

Summarized by: **010N003W035** *(Buffered PLSS Section)*

Wetland and Riparian Mapping

Explain

P - Palustrine

UB - Unconsolidated Bottom

- F - Semipermanently Flooded — 14 Acres
  - x - Excavated — **14 Acres** **PUBFx**

P - Palustrine, UB - Unconsolidated Bottom
Wetlands where mud, silt or similar fine particles cover at least 25% of the bottom, and where vegetation cover is less than 30%.

AB - Aquatic Bed

- F - Semipermanently Flooded — 1 Acres
  - h - Diked/Impounded — **1 Acres** **PABFh**
  - x - Excavated — **<1 Acres** **PABFx**
- K - Artificially Flooded — <1 Acres
  - (no modifier) — **<1 Acres** **PABK**

P - Palustrine, AB - Aquatic Bed
Wetlands with vegetation growing on or below the water surface for most of the growing season.

US - Unconsolidated Shore

- A - Temporarily Flooded — 5 Acres
  - x - Excavated — **5 Acres** **PUSAx**

P - Palustrine, US - Unconsolidated Shore
Wetlands with less than 75% areal cover of stones, boulders, or bedrock. AND with less than 30% vegetative cover AND the wetland is irregularly exposed due to seasonal or irregular flooding and subsequent drying.

EM - Emergent

- A - Temporarily Flooded — 8 Acres
  - (no modifier) — **6 Acres** **PEMA**
  - h - Diked/Impounded — **1 Acres** **PEMAh**
  - x - Excavated — **1 Acres** **PEMAx**
- C - Seasonally Flooded — 11 Acres
  - (no modifier) — **11 Acres** **PEMC**
  - h - Diked/Impounded — **<1 Acres** **PEMCh**
  - x - Excavated — **<1 Acres** **PEMCx**

P - Palustrine, EM - Emergent
Wetlands with erect, rooted herbaceous vegetation present during most of the growing season.

SS - Scrub-Shrub

- A - Temporarily Flooded — 4 Acres
  - (no modifier) — **4 Acres** **PSSA**
- C - Seasonally Flooded — 5 Acres
  - (no modifier) — **5 Acres** **PSSC**

P - Palustrine, SS - Scrub-Shrub
Wetlands dominated by woody vegetation less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

FO - Forested

A - Temporarily Flooded 13 Acres

(no modifier) **13 Acres** **PFOA**

P - Palustrine, FO - Forested
Wetlands dominated by woody vegetation greater than 6 meters (20 feet) tall.

R - Riverine (Rivers)

3 - Upper Perennial

UB - Unconsolidated Bottom

G - Intermittently Exposed 11 Acres

(no modifier) **10 Acres** **R3UBG**
x - Excavated **1 Acres** **R3UBGx**

R - Riverine (Rivers), 3 - Upper Perennial, UB - Unconsolidated Bottom
Stream channels where the substrate is at least 25% mud, silt or other fine particles.

US - Unconsolidated Shore

A - Temporarily Flooded 1 Acres

(no modifier) **1 Acres** **R3USA**

R - Riverine (Rivers), 3 - Upper Perennial, US - Unconsolidated Shore
Shorelines with less than 75% areal cover of stones, boulders, or bedrock and less than 30% vegetation cover. The area is also irregularly exposed due to seasonal or irregular flooding and subsequent drying.

4 - Intermittent

SB - Stream Bed

A - Temporarily Flooded 4 Acres

(no modifier) **2 Acres** **R4SBA**
x - Excavated **2 Acres** **R4SBAx**

R - Riverine (Rivers), 4 - Intermittent, SB - Stream Bed
Active channel that contains periodic water flow.

Rp - Riparian

1 - Lotic

SS - Scrub-Shrub
(no modifier) **8 Acres** **Rp1SS**

Rp - Riparian, 1 - Lotic, SS - Scrub-Shrub
This type of riparian area is dominated by woody vegetation that is less than 6 meters (20 feet) tall. Woody vegetation includes tree saplings and trees that are stunted due to environmental conditions.

FO - Forested
(no modifier) **23 Acres** **Rp1FO**

Rp - Riparian, 1 - Lotic, FO - Forested
This riparian class has woody vegetation that is greater than 6 meters (20 feet) tall.

EM - Emergent
(no modifier) **3 Acres** **Rp1EM**

Rp - Riparian, 1 - Lotic, EM - Emergent
Riparian areas that have erect, rooted herbaceous vegetation during most of the growing season.

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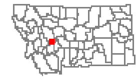

Latitude	Longitude
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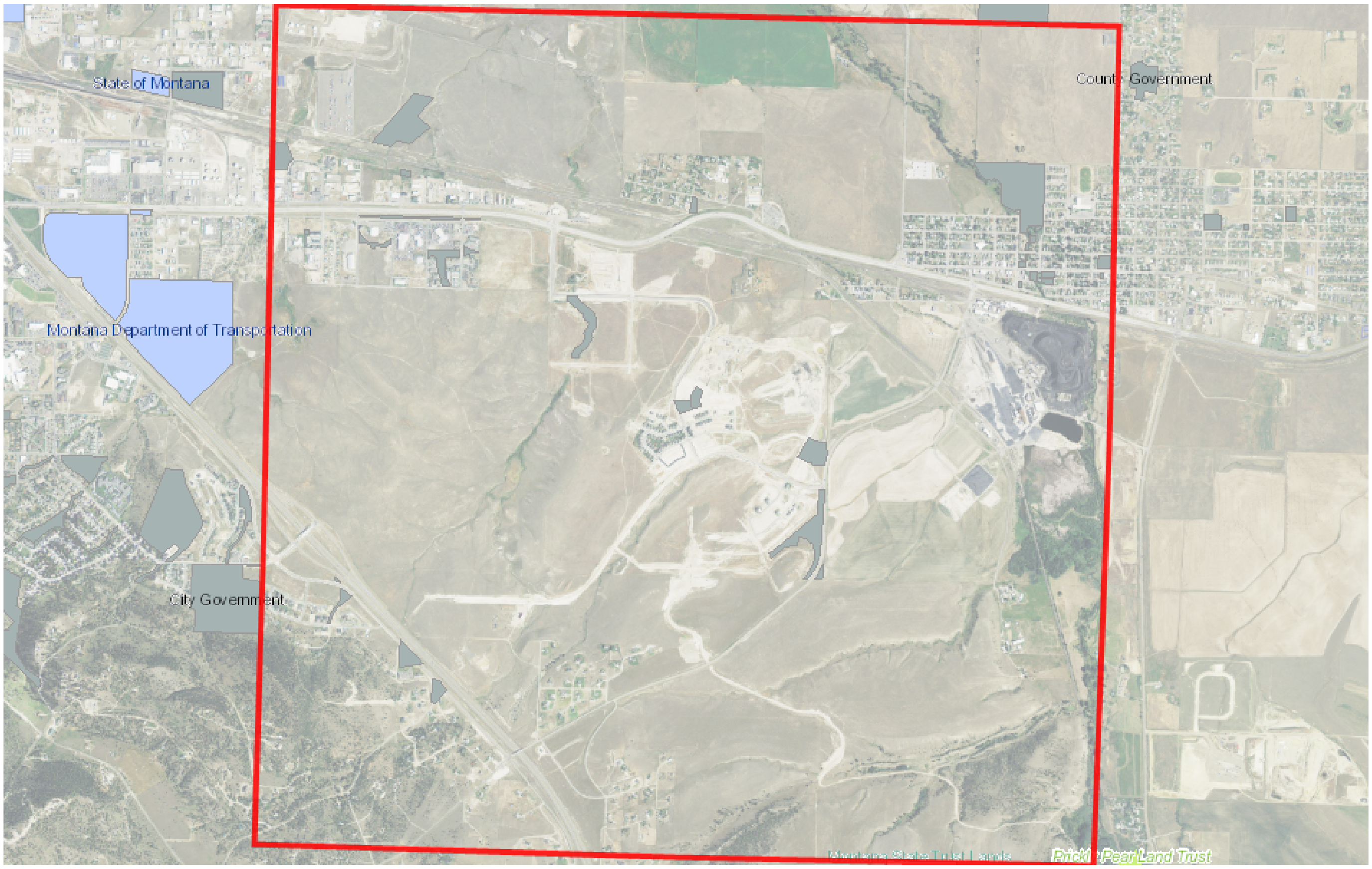
Land Management

Summarized by: **010N003W035** *(Buffered PLSS Section)*



Land Management Summary

Explain

	Ownership	Tribal	Easements	Other Boundaries (possible overlap)
Public Lands	**81 Acres (1%)**			
Local	81 Acres (1%)			
Local Government	81 Acres (1%)			
Local Government Owned	81 Acres (1%)			
Private Lands or Unknown Ownership	**5,778 Acres (99%)**			

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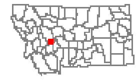


Latitude	Longitude
46.55718	-111.91459
46.60343	-111.97782

Biological Reports

Summarized by: **010N003W035** *(Buffered PLSS Section)*

Within the report area you have requested, citations for all reports and publications associated with plant or animal observations in Montana Natural Heritage Program (MTNHP) databases are listed and, where possible, links to the documents are included.

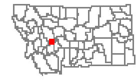
The MTNHP plans to include reports associated with terrestrial and aquatic communities in the future as allowed for by staff resources. If you know of reports or publications associated with species or biological communities within the report area that are not shown in this report, please let us know: mtnhp@mt.gov

Anderson, M.E. 1977. Aspects of the ecology of two sympatric species of Thamnophis and heavy metal accumulation with the species. M.S. thesis, University of Montana, Missoula. 147 pp.

MONTANA
Natural Heritage Program
A program of the **Montana State Library's Natural Resource Information System**

Legend

Model Icons	Habitat Icons	Range Icons	Num Obs
N Suitable (native range)	C Common	N Non-native	Count of obs with 'good precision' (<=1000m)
O Optimal Suitability	O Occasional		**+** indicates additional 'poor precision' obs (1001m-10,000m)
M Moderate Suitability			
L Low Suitability			
I Suitable (introduced range)			



Latitude	Longitude
46.55718	-111.91459
46.60343	-111.97782

Invasive and Pest Species

Summarized by: **010N003W035** *(Buffered PLSS Section)*

# Obs	Predicted Model	Associated Habitat	Range

Aquatic Invasive Species

V - Iris pseudacorus *(Yellowflag Iris)* N2A/AIS — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 15% Moderate (inductive), L 79% Low (inductive)

V - Potamogeton crispus *(Curly-leaf Pondweed)* N2B/AIS — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**
Predicted Models: L 42% Low (inductive)

V - Myriophyllum spicatum *(Eurasian Water-milfoil)* N2A/AIS — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 27% Low (inductive)

V - Nymphaea odorata *(American Water-lily)* AIS — N

View in Field Guide View Predicted Models View Associated Habitat View Range Maps
Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**
Predicted Models: I 70% Suitable (introduced range) (deductive) **Associated Habitats:** C 1% Common

Noxious Weeds: Priority 1A

V - Isatis tinctoria *(Dyer's Woad)* N1A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 55% Optimal (inductive), M 30% Moderate (inductive), L 15% Low (inductive)

V - Centaurea solstitialis *(Yellow Starthistle)* N1A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 18% Optimal (inductive), M 52% Moderate (inductive), L 30% Low (inductive)

V - Phragmites australis ssp. australis *(European Common Reed)* N1A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1A - Non-native Species Global: **G5T5** State: **SNA**
Predicted Models: M 8% Moderate (inductive), L 39% Low (inductive)

V - Taeniatherum caput-medusae *(Medusahead)* N1A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1A - Non-native Species Global: **G4G5** State: **SNA**
Predicted Models: L 100% Low (inductive)

Noxious Weeds: Priority 1B

V - Lythrum salicaria *(Purple Loosestrife)* N1B — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1B - Non-native Species Global: **G5** State: **SNA**
Predicted Models: O 16% Optimal (inductive), M 68% Moderate (inductive), L 16% Low (inductive)

V - Polygonum cuspidatum *(Japanese Knotweed)* N1B — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1B - Non-native Species Global: **GNRTNR** State: **SNA**
Predicted Models: O 6% Optimal (inductive), M 35% Moderate (inductive), L 44% Low (inductive)

V - Echium vulgare *(Blueweed)* N1B — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 74% Low (inductive)

V - Cytisus scoparius *(Scotch Broom)* N1B — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 1B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 28% Low (inductive)

Noxious Weeds: Priority 2A

V - Rhamnus cathartica *(Common Buckthorn)* N2A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 56% Optimal (inductive), M 44% Moderate (inductive), L 0% Low (inductive)

V - Ventenata dubia *(Ventenata)* N2A — Not Assigned — N

View in Field Guide View Predicted Models View Range Maps
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 34% Optimal (inductive), M 65% Moderate (inductive), L 1% Low (inductive)

V - **Lepidium latifolium** *(Perennial Pepperweed)* N2A | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 15% Moderate (inductive), L 85% Low (inductive)

V - **Iris pseudacorus** *(Yellowflag Iris)* N2A/AIS | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 15% Moderate (inductive), L 79% Low (inductive)

V - **Hieracium praealtum** *(Kingdevil Hawkweed)* N2A | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 11% Moderate (inductive), L 36% Low (inductive)

V - **Ranunculus acris** *(Tall Buttercup)* N2A | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Non-native Species Global: **G5** State: **SNA**
Predicted Models: M 1% Moderate (inductive), L 94% Low (inductive)

V - **Hieracium aurantiacum** *(Orange Hawkweed)* N2A | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 33% Low (inductive)

V - **Myriophyllum spicatum** *(Eurasian Water-milfoil)* N2A/AIS | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2A - Aquatic Invasive Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 27% Low (inductive)

Noxious Weeds: Priority 2B

V - **Linaria dalmatica** *(Dalmatian Toadflax)* N2B | 7 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
Predicted Models: O 23% Optimal (inductive), M 77% Moderate (inductive)

V - **Centaurea diffusa** *(Diffuse Knapweed)* N2B | 5 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 8% Optimal (inductive), M 77% Moderate (inductive), L 15% Low (inductive)

V - **Lepidium draba** *(Whitetop)* N2B | 6 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 5% Optimal (inductive), M 79% Moderate (inductive), L 16% Low (inductive)

V - **Linaria vulgaris** *(Yellow Toadflax)* N2B | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 1% Optimal (inductive), M 11% Moderate (inductive), L 88% Low (inductive)

V - **Centaurea stoebe** *(Spotted Knapweed)* N2B | 14 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 81% Moderate (inductive), L 19% Low (inductive)

V - **Cynoglossum officinale** *(Common Hound's-tongue)* N2B | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 63% Moderate (inductive), L 37% Low (inductive)

V - **Euphorbia virgata** *(Leafy Spurge)* N2B | 1 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNRTNR** State: **SNA**
Predicted Models: M 63% Moderate (inductive), L 37% Low (inductive)

V - **Cirsium arvense** *(Canada Thistle)* N2B | 4 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **G5** State: **SNA**
Predicted Models: M 37% Moderate (inductive), L 63% Low (inductive)

V - **Acroptilon repens** *(Russian Knapweed)* N2B | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 30% Moderate (inductive), L 70% Low (inductive)

V - **Convolvulus arvensis** *(Field Bindweed)* N2B | 4 | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 27% Moderate (inductive), L 73% Low (inductive)

V - **Tanacetum vulgare** *(Common Tansy)* N2B | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 26% Moderate (inductive), L 69% Low (inductive)

V - **Berteroa incana** *(Hoary False-alyssum)* N2B | | Not Assigned | N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 1% Moderate (inductive), L 94% Low (inductive)

V - **Potentilla recta** *(Sulphur Cinquefoil)* N2B Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 58% Low (inductive)

V - **Tamarix ramosissima** *(Salt Cedar)* N2B Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 57% Low (inductive)

V - **Leucanthemum vulgare** *(Oxeye Daisy)* N2B Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 51% Low (inductive)

V - **Potamogeton crispus** *(Curly-leaf Pondweed)* N2B/AIS Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Aquatic Invasive Species - Non-native Species Global: **G5** State: **SNA**
Predicted Models: L 42% Low (inductive)

V - **Hypericum perforatum** *(Common St. John's-wort)* N2B Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Noxious Weed: Priority 2B - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 1% Low (inductive)

Regulated Weeds: Priority 3

V - **Bromus tectorum** *(Cheatgrass)* R3 Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 25% Moderate (inductive), L 75% Low (inductive)

V - **Elaeagnus angustifolia** *(Russian Olive)* R3 Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Regulated Weed: Priority 3 - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 33% Low (inductive)

Biocontrol Species

I - **Oberea erythrocephala** *(Red-headed Leafy Spurge Stem Borer)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: O 11% Optimal (inductive), M 89% Moderate (inductive)

I - **Aphthona lacertosa** *(Brown-legged Leafy Spurge Flea Beetle)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 100% Moderate (inductive), L 0% Low (inductive)

I - **Aphthona nigriscutis** *(Black Dot Leafy Spurge Flea Beetle)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 26% Moderate (inductive), L 74% Low (inductive)

I - **Cyphocleonus achates** *(Knapweed Root Weevil)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 18% Moderate (inductive), L 82% Low (inductive)

I - **Mecinus janthiniformis** *(Dalmatian Toadflax Stem-boring Weevil)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: M 12% Moderate (inductive), L 88% Low (inductive)

I - **Mecinus janthinus** *(Yellow Toadflax Stem-boring Weevil)* BIOCNTRL Not Assigned N

View in Field Guide **View Predicted Models** **View Range Maps**
Biocontrol Species - Non-native Species Global: **GNR** State: **SNA**
Predicted Models: L 16% Low (inductive)

Introduction to Montana Natural Heritage Program

P.O. Box 201800 • 1515 East Sixth Avenue • Helena, MT 59620-1800 • fax 406.444.0266 • phone 406.444.5363 • mtnhp.org

Introduction

The Montana Natural Heritage Program (MTNHP) is Montana's source for reliable and objective information on Montana's native species and habitats, emphasizing those of conservation concern. MTNHP was created by the Montana legislature in 1983 as part of the Natural Resource Information System (NRIS) at the Montana State Library (MSL). MTNHP is "a program of information acquisition, storage, and retrieval for data relating to the flora, fauna, and biological community types of Montana" (MCA 90-15-102). MTNHP's activities are guided by statute as well as through ongoing interaction with, and feedback from, principal data source agencies such as Montana Fish, Wildlife, and Parks, the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation, the Montana University System, the US Forest Service, and the US Bureau of Land Management. Since the first staff was hired in 1985, the Program has logged a long record of success, and developed into a highly respected, service-oriented program. MTNHP is widely recognized as one of the most advanced and effective of over 80 natural heritage programs throughout the Western Hemisphere.

Vision

Our vision is that public agencies, the private sector, the education sector, and the general public will trust and rely upon MTNHP as the source for information and expertise on Montana's species and habitats, especially those of conservation concern. We strive to provide easy access to our information in order for users to save time and money, speed environmental reviews, and inform decision making.

Core Values

- We endeavor to be a single statewide source of accurate and up-to-date information on Montana's plants, animals, and aquatic and terrestrial biological communities.
- We actively listen to our data users and work responsively to meet their information and training needs.
- We strive to provide neutral, trusted, timely, and equitable service to all of our information users.
- We make every effort to be transparent to our data users in setting work priorities and providing data products.

Confidentiality

All information requests made to the Montana Natural Heritage Program are considered library records and are protected from disclosure by the Montana Library Records Confidentiality Act (MCA 22-1-11).

Information Managed

Information managed at the Montana Natural Heritage Program is botanical, zoological, and ecological information that describes the distribution (e.g., observations, structured surveys, range polygons, predicted habitat suitability models), conservation status (e.g., global and state conservation status ranks, including threats), and other supporting information (e.g., accounts and references) on the biology and ecology of species and biological communities.

Data Use Terms and Conditions

- Montana Natural Heritage Program (MTNHP) products and services are based on biological data and the objective interpretation of those data by professional scientists. MTNHP does not advocate any particular philosophy of natural resource protection, management, development, or public policy.
- MTNHP has no natural resource management or regulatory authority. Products, statements, and services from MTNHP are intended to inform parties as to the state of scientific knowledge about certain natural resources, and to further develop that knowledge. The information is not intended as natural resource management guidelines or prescriptions or a determination of environmental impacts. MTNHP recommends consultation with appropriate state, federal, and tribal resource management agencies and authorities in the area where your project is located.
- Information on the status and spatial distribution of biological resources produced by MTNHP are intended to inform parties of the state-wide status, known occurrence, or the likelihood of the presence of those resources. **These products are not intended to substitute for field-collected data, nor are they intended to be the sole basis for natural resource management decisions.**
- MTNHP does not portray its data as exhaustive or comprehensive inventories of rare species or biological communities. **Field verification of the absence or presence of sensitive species and biological communities will always be an important obligation of users of our data.**
- MTNHP responds equally to all requests for products and services, regardless of the purpose or identity of the requester.
- Because MTNHP constantly updates and revises its databases with new data and information, products will become outdated over time. Interested parties are encouraged to obtain the most current information possible from MTNHP, rather than using older products. We add, review, update, and delete records on a daily basis. Consequently, we strongly advise that you update your MTNHP data sets at a minimum of every four months for most applications of our information.
- MTNHP data require a certain degree of biological expertise for proper analysis, interpretation, and application. Our staff is available to advise you on questions regarding the interpretation or appropriate use of the data that we provide. See Contact Information for MTNHP Staff
- The information provided to you by MTNHP may include sensitive data that if publicly released might jeopardize the welfare of threatened, endangered, or sensitive species or biological communities. This information is intended for distribution or use only within your department, agency, or business. Subcontractors may have access to the data during the course of any given project, but should not be given a copy for their use on subsequent, unrelated work.
- MTNHP data are made freely available. Duplication of hard-copy or digital MTNHP products with the intent to sell is prohibited without written consent by MTNHP. Should you be asked by individuals outside your organization for the type of data that we provide, please refer them to MTNHP.
- MTNHP and appropriate staff members should be appropriately acknowledged as an information source in any third-party product involving MTNHP data, reports, papers, publications, or in maps that incorporate MTNHP graphic elements.
- Sources of our data include museum specimens, published and unpublished scientific literature, field surveys by state and federal agencies and private contractors, and reports from knowledgeable individuals. MTNHP actively solicits and encourages additions, corrections and updates, new observations or collections, and comments on any of the data we provide.
- MTNHP staff and contractors do not enter or cross privately-owned lands without express permission from the landowner. However, the program cannot guarantee that information provided to us by others was obtained under adherence to this policy.

Suggested Contacts for Natural Resource Management Agencies

As required by Montana statute (MCA 90-15), the Montana Natural Heritage Program works with state, federal, tribal, nongovernmental organizations, and private partners to ensure that the latest animal and plant distribution and status information is incorporated into our databases so that it can be used to inform a variety of permitting and planning processes and management decisions. We encourage you to contact state, federal, and tribal resource management agencies in the area where your project is located and review the permitting overviews by the Montana Department of Environmental Quality, the Montana Department of Natural Resources and Conservation and the Index of Environmental Permits for Montana for guidelines relevant to your efforts. In particular, we encourage you to contact the Montana Department of Fish, Wildlife, and Parks for the latest data and management information regarding hunted and high-profile management species and to use the U.S. Fish and Wildlife Service's Information Planning and Consultation (IPAC) website regarding U.S. Endangered Species Act listed Threatened, Endangered, or Candidate species.

For your convenience, we have compiled a list of relevant agency contacts and links below:

Montana Fish, Wildlife, and Parks

Fish Species	Zachary Shattuck zshattuck@mt.gov (406) 444-1231 or Eric Roberts eroberts@mt.gov (406) 444-5334
American Bison Black-footed Ferret Black-tailed Prairie Dog Bald Eagle Golden Eagle Common Loon Least Tern Piping Plover Whooping Crane	Kristian Smucker KSmucker@mt.gov (406) 444-5209
Grizzly Bear Greater Sage Grouse Trumpeter Swan Big Game Upland Game Birds Furbearers	Brian Wakeling Brian.Wakeling@mt.gov (406) 444-3940
Managed Terrestrial Game and Nongame Animal Data	Smith Wells – MFWP Data Analyst smith.wells@mt.gov (406) 444-3759
Fisheries Data	Ryan Alger – MFWP Data Analyst ryan.alger@mt.gov (406) 444-5365
Wildlife and Fisheries Scientific Collector's Permits	https://fwp.mt.gov/buyandapply/commercialwildlifeandscientificpermits/scientific Kammi McClain for Wildlife Kammi.McClain@mt.gov (406) 444-2612 Kim Wedde for Fisheries kim.wedde@mt.gov (406) 444-5594
Fish and Wildlife Recommendations for Subdivision Development	Charlie Sperry CSperry@mt.gov (406) 444-3888 See https://fwp.mt.gov/conservation/living-with-wildlife/subdivision-recommendations
Regional Contacts 	Region 1 (Kalispell) (406) 752-5501 fwprg12@mt.gov Region 2 (Missoula) (406) 542-5500 fwprg22@mt.gov Region 3 (Bozeman) (406) 577-7900 fwprg3@mt.gov Region 4 (Great Falls) (406) 454-5840 fwprg42@mt.gov Region 5 (Billings) (406) 247-2940 fwprg52@mt.gov Region 6 (Glasgow) (406) 228-3700 fwprg62@mt.gov Region 7 (Miles City) (406) 234-0900 fwprg72@mt.gov

Montana Department of Agriculture
General Contact Information: https://agr.mt.gov/About/Office-Locations/Office-Locations-and-Field-Offices
Noxious Weeds: https://agr.mt.gov/Noxious-Weeds

Montana Department of Environmental Quality
Permitting and Operator Assistance for all Environmental Permits: https://deq.mt.gov/Permitting

Montana Department of Natural Resources and Conservation
Overview of, and contacts for, licenses and permits for state lands, water, and forested lands:
http://dnrc.mt.gov/licenses-and-permits

Stream Permitting (310 permits) and an overview of various water and stream related permits (e.g., Stream Protection Act 124, Federal Clean Water Act 404, Federal Rivers and Harbors Act Section 10, Short-term Water Quality Standard for Turbidity 318 Authorization, etc.).
http://dnrc.mt.gov/divisions/cardd/conservation-districts/the-310-law

Flood and Fire Resources: http://dnrc.mt.gov/flood-and-fire

Bureau of Land Management

Montana Field Office Contacts:

Billings	(406) 896-5013
Butte	(406) 533-7600
Dillon	(406) 683-8000
Glasgow	(406) 228-3750
Havre	(406) 262-2820
Lewistown	(406) 538-1900
Malta	(406) 654-5100
Miles City	(406) 233-2800
Missoula	(406) 329-3914

United States Army Corps of Engineers
Montana Regulatory Office for federal permits related to construction in water and wetlands
https://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/ (406) 441-1375

United States Environmental Protection Agency
Environmental information, notices, permitting, and contacts https://www.epa.gov/mt
Gateway to state resource locators https://www.envcap.org/srl/index.php

United States Fish and Wildlife Service
Information Planning and Conservation (IPAC) website: https://ecos.fws.gov/ipac/
Montana Ecological Services Field Office: https://www.fws.gov/montanafieldoffice/ (406) 449-5225

United States Forest Service

Regional Office – Missoula, Montana Contacts			
Wildlife Program Leader	Tammy Fletcher	tammy.fletcher2@usda.gov	(406) 329-3086
Wildlife Ecologist	Cara Staab	cara.staab@usda.gov	(406) 329-3677
Fish Program Leader	Scott Spaulding	scott.spaulding@usda.gov	(406) 329-3287
Fish Ecologist	Cameron Thomas	cameron.thomas@usda.gov	(406) 329-3087
TES Program	Lydia Allen	lydia.allen@usda.gov	(406) 329-3558
Interagency Grizzly Bear Coordinator	Scott Jackson	scott.jackson@usda.gov	(406) 329-3664
Acting Regional Botanist	Amanda Hendrix	amanda.hendrix@usda.gov	(651) 447-3016
Regional Vegetation Ecologist	Mary Manning	marry.manning@usda.gov	(406) 329-3304
Invasive Species Program Manager	Michelle Cox	michelle.cox2@usda.gov	(406) 329-3669

Tribal Nations

[Assiniboine & Gros Ventre Tribes – Fort Belknap Reservation]
[Assiniboine & Sioux Tribes – Fort Peck Reservation]
[Blackfeet Tribe - Blackfeet Reservation]
[Chippewa Creek Tribe - Rocky Boy's Reservation]
[Crow Tribe – Crow Reservation]
[Little Shell Chippewa Tribe]
[Northern Cheyenne Tribe – Northern Cheyenne Reservation]
[Salish & Kootenai Tribes - Flathead Reservation]

Natural Heritage Programs and Conservation Data Centers in Surrounding States and Provinces

Alberta Conservation Information Management System
British Columbia Conservation Data Centre
Idaho Natural Heritage Program
North Dakota Natural Heritage Program
Saskatchewan Conservation Data Centre
South Dakota Natural Heritage Program
Wyoming Natural Diversity Database

Invasive Species Management Contacts and Information

Aquatic Invasive Species

Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

Noxious Weeds

Montana Weed Control Association Contacts Webpage
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Integrated Noxious Weed Management after Wildfires
Fire Management and Invasive Plants

Introduction to Native Species

Within the report area you have requested, separate summaries are provided for: (1) Species Occurrences (SO) for plant and animal Species of Concern, Special Status Species (SSS), Important Animal Habitat (IAH) and some Potential Plant Species of Concern; (2) other observed non Species of Concern or Species of Concern without suitable documentation to create Species Occurrence polygons; and (3) other non-documented species that are potentially present based on their range, predicted suitable habitat model output, or presence of associated habitats. Each of these summaries provides the following information when present for a species: (1) the number of Species Occurrences and associated delineation criteria for construction of these polygons that have long been used for considerations of documented Species of Concern in environmental reviews; (2) the number of observations of each species; (3) the geographic range polygons for each species that the report area overlaps; (4) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (5) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (6) a variety of conservation status ranks and links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers below or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document native and introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are restricted by budgets, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species and biological communities will always be an important obligation of users of our data.**

If you are aware of observation datasets that the MTNHP is missing, please report them to the Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov. If you have animal observations that you would like to contribute, you can submit them to our Animal Observation Entry Tool You can also submit plant and animal observations via Excel spreadsheets posted at https://mtnhp.org/observations.asp or via the Montana Natural Heritage Observations project in iNaturalist

Observations

The MTNHP manages information on several million animal and plant observations that have been reported by professional biologists and private citizens from across Montana. The majority of these observations are submitted in digital format from standardized databases associated with research or monitoring efforts and spreadsheets of incidental observations submitted by professional biologists and amateur naturalists. At a minimum, accepted observation records must contain a credible species identification (i.e. appropriate geographic range, date, and habitat and, if species are difficult to identify, a photograph and/or notes on key identifying features), a date or date range, observer name, locational information (ideally with latitude and longitude in decimal degrees), notes on numbers observed, and species behavior or habitat use (e.g., is the observation likely associated with reproduction). Bird records are also required to have information associated with date-appropriate breeding or overwintering status of the species observed. MTNHP reviews observation records to ensure that they are mapped correctly, occur within date ranges when the species is known to be present or detectable, occur within the known seasonal geographic range of the species, and occur in appropriate habitats. MTNHP also assigns each record a locational uncertainty value in meters to indicate the spatial precision associated with the record's mapped coordinates. Only records with locational uncertainty values of 10,000 meters or less are included in environmental summary reports and number summaries are only provided for records with locational uncertainty values of 1,000 meters or less.

Species Occurrences

The MTNHP evaluates plant and animal observation records for species of higher conservation concern to determine whether they are worthy of inclusion in the Species Occurrence (SO) layer for use in environmental reviews; observations not worthy of inclusion in this layer include long distance dispersal events, migrants observed away from key migratory stopover habitats, and winter observations. An SO is a polygon depicting what is known about a species occupancy from direct observation with a defined level of locational uncertainty and any inference that can be made about adjacent habitat use from the latest peer-reviewed science. If an observation can be associated with a map feature that can be tracked (e.g., a wetland boundary for a wetland associated plant) then this polygon feature is used to represent the SO. Areas that can be inferred as probable occupied habitat based on direct observation of a species location and what is known about the foraging area or home range size of the species may be incorporated into the SO. Species Occurrences generally belong to one of the following categories:

Plant Species Occurrences

A documented location of a specimen collection or observed plant population. In some instances, adjacent, spatially separated clusters are considered subpopulations and are grouped as one occurrence (e.g., the subpopulations occur in ecologically similar habitats, and their spatial proximity likely allows them to interbreed). Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Plant SO's are only created for Species of Concern and Potential Species of Concern.

Animal Species Occurrences

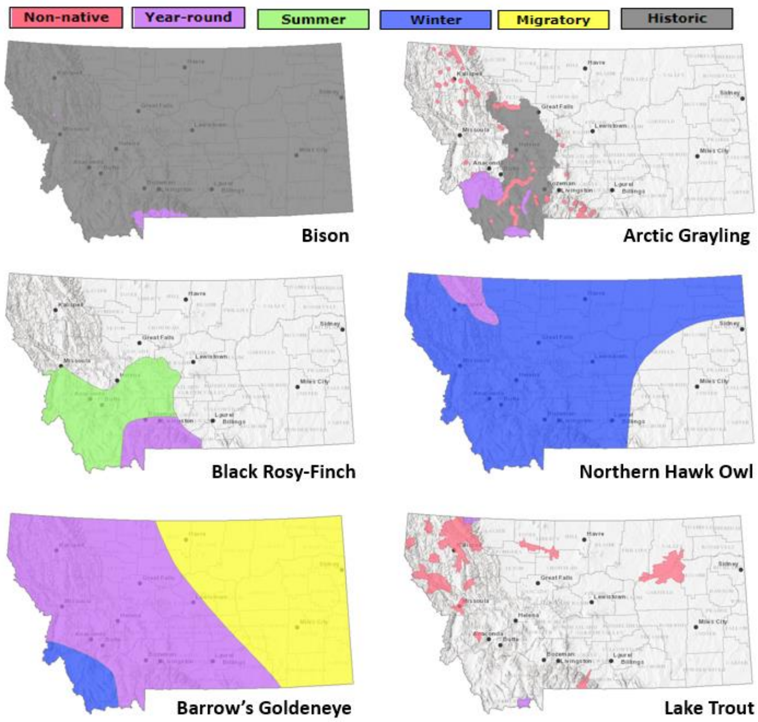
The location of a verified observation or specimen record typically known or assumed to represent a breeding population or a portion of a breeding population. Animal SO's are generally: (1) buffers of terrestrial point observations based on documented species' home range sizes; (2) buffers of stream segments to encompass occupied streams and immediate adjacent riparian habitats; (3) polygonal features encompassing known or likely breeding populations (e.g., a wetland for some amphibians or a forested portion of a mountain range for some wide ranging carnivores); or (4) combinations of the above. Tabular information for multiple observations at the same SO location is generally linked to a single polygon. Species Occurrence polygons may encompass some unsuitable habitat in some instances in order to avoid heavy data processing associated with clipping out habitats that are readily assessed as unsuitable by the data user (e.g., a point buffer of a terrestrial species may overlap into a portion of a lake that is obviously inappropriate habitat for the species). Animal SO's are only created for Species of Concern and Special Status Species (e.g., Bald Eagle).

Other Occurrence Polygons

These include significant biological features not included in the above categories, such as Important Animal Habitats like bird rookeries and bat roosts, and peatlands or other wetland and riparian communities that support diverse plant and animal communities.

Geographic Range Polygons

Geographic range polygons are still under development for most plant and invertebrate species. Native year-round, summer, winter, migratory and historic geographic range polygons as well as polygons for introduced populations have been defined for most vertebrate animal species for which there are enough observations, surveys, and knowledge of appropriate seasonal habitat use to define them (see examples to left). These native or introduced range polygons bound the extent of known or likely occupied habitats for non-migratory and relative sedentary species and the regular extent of known or likely occupied habitats for migratory and long-distance dispersing species; polygons may include unsuitable intervening habitats. For most species, a single polygon can represent the year-round or seasonal range, but breeding ranges of some colonial nesting water birds and some introduced species are represented more patchily when supported by data. Some ranges are mapped more broadly than actual distributions in order to be visible on statewide maps (e.g., fish).



Predicted Suitable Habitat Models

Predicted habitat suitability models have been created for plant and animal Species of Concern and are undergoing development for non-Species of Concern. For species for which models have been completed, the environmental summary report includes simple rule-based associations with streams for aquatic species and seasonal habitats for game species as well as mathematically complex Maximum Entropy models (Phillips et al. 2006, Ecological Modeling 190:231-259) constructed from a variety of statewide biotic and abiotic layers and presence only data for individual species for most terrestrial species. For the Maximum Entropy models, we reclassified 90 x 90-meter continuous model output into suitability classes (unsuitable, low, moderate, and optimal) then aggregated that into the one square mile hexagons used in the environmental summary report; this is the finest spatial scale we suggest using this information in management decisions and survey planning. Full model write ups for individual species that discuss model goals, inputs, outputs, and evaluation in much greater detail are posted on the MTNHP's Predicted Suitable Habitat Models webpage. Evaluations of predictive accuracy and specific limitations are included with the metadata for models of individual species. **Model outputs should not be used in place of on-the-ground surveys for species. Instead model outputs should be used in conjunction with habitat evaluations to determine the need for on-the-ground surveys for species.** We suggest that the percentage of predicted optimal and moderate suitable habitat within the report area be used in conjunction with geographic range polygons and the percentage of commonly associated habitats to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning.

Associated Habitats

Within the boundary of the intersected hexagons, we provide the approximate percentage of commonly or occasionally associated habitat for vertebrate animal species that regularly breed, overwinter, or migrate through the state; a detailed list of commonly and occasionally associated habitats is provided in individual species accounts in the Montana Field Guide We assigned common or occasional use of each of the ecological systems mapped in Montana by: (1) using personal knowledge and reviewing literature that summarizes the breeding, overwintering, or migratory habitat requirements of each species; (2) evaluating structural characteristics and distribution of each ecological system relative to the species' range and habitat requirements; (3) examining the observation records for each species in the state-wide point observation database associated with each ecological system; and (4) calculating the percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system to get a measure of numbers of observations versus availability of habitat. Species that breed in Montana were only evaluated for breeding habitat use, species that only overwinter in Montana were only evaluated for overwintering habitat use, and species that only migrate through Montana were only evaluated for migratory habitat use. In general, species were listed as associated with an ecological system if structural characteristics of used habitat documented in the literature were present in the ecological system or large numbers of point observations were associated with the ecological system. However, species were not listed as associated with an ecological system if there was no support in the literature for use of structural characteristics in an ecological system, even if point observations were associated with that system. Common versus occasional association with an ecological system was assigned based on the degree to which the structural characteristics of an ecological system matched the preferred structural habitat characteristics for each species as represented in the scientific literature. The percentage of observations associated with each ecological system relative to the percent of Montana covered by each ecological system was also used to guide assignment of common versus occasional association.

We suggest that the percentage of commonly associated habitat within the report area be used in conjunction with geographic range polygons and the percentage of predicted optimal and moderate suitable habitat from predictive models to generate lists of potential species that may occupy broader landscapes for the purposes of landscape-level planning. Users of this information should be aware that land cover mapping accuracy is particularly problematic when the systems occur as small patches or where the land cover types have been altered over the past decade. Thus, particular caution should be used when using the associations in assessments of smaller areas (e.g., evaluations of public land survey sections).

Introduction to Land Cover

Land Use/Land Cover is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The layer records all Montana natural vegetation, land cover and land use, classified from satellite and aerial imagery, mapped at a scale of 1:100,000, and interpreted with supporting ground-level data. The baseline map is adapted from the Northwest ReGAP (NWGAP) project land cover classification, which used 30m resolution multi-spectral Landsat imagery acquired between 1999 and 2001. Vegetation classes were drawn from the Ecological System Classification developed by NatureServe (Comer et al. 2003). The land cover classes were developed by Anderson et al. (1976). The NWGAP effort encompasses 12 map zones. Montana overlaps seven of these zones. The two NWGAP teams responsible for the initial land cover mapping effort in Montana were Sanborn and NWGAP at the University of Idaho. Both Sanborn and NWGAP employed a similar modeling approach in which Classification and Regression Tree (CART) models were applied to Landsat ETM+ scenes. The Spatial Analysis Lab within the Montana Natural Heritage Program was responsible for developing a seamless Montana land cover map with a consistent statewide legend from these two separate products. Additionally, the Montana land cover layer incorporates several other land cover and land use products (e.g., MSDI Structures and Transportation themes and the Montana Department of Revenue Final Land Unit classification) and reclassifications based on plot-level data and the latest NAIP imagery to improve accuracy and enhance the usability of the theme. Updates are done as partner support and funding allow, or when other MSDI datasets can be incorporated. Recent updates include fire perimeters and agricultural land use (annually), energy developments such as wind, oil and gas installations (2014), roads, structures and other impervious surfaces (various years): and local updates/improvements to specific ecological systems (e.g., central Montana grassland and sagebrush ecosystems). Current and previous versions of the Land Use/Land Cover layer with full metadata are available for download at the Montana State Library's Geographic Information Clearinghouse

Within the report area you have requested, land cover is summarized by acres of Level 1, Level 2, and Level 3 Ecological Systems.

Literature Cited

Anderson, J.R. E.E. Hardy, J.T. Roach, and R.E. Witmer. 1976. A land use and land cover classification system for use with remote sensor data. U.S. Geological Survey Professional Paper 964.

Comer, P., D. Faber-Langendoen, R. Evans, S. Gawler, C. Josse, G. Kittel, S. Menard, M. Pyne, M. Reid, K. Schulz, K. Snow, and J. Teague. 2003. Ecological systems of the United States: A working classification of U.S. terrestrial systems. NatureServe, Arlington, VA.

Introduction to Wetland and Riparian

Within the report area you have requested, wetland and riparian mapping is summarized by acres of each classification present. Summaries are only provided for modern MTNHP wetland and riparian mapping and not for outdated (NWI Legacy) or incomplete (NWI Scalable) mapping efforts; described here. MTNHP has made all three of these datasets and associated metadata available for separate download on the Montana Wetland and Riparian Framework web page.

Wetland and Riparian mapping is one of 15 Montana Spatial Data Infrastructure framework layers considered vital for making statewide maps of Montana and understanding its geography. The wetland and riparian framework layer consists of spatial data representing the extent, type, and approximate location of wetlands, riparian areas, and deep water habitats in Montana.

Wetland and riparian mapping is completed through photointerpretation of 1-m resolution color infrared aerial imagery acquired from 2005 or later. A coding convention using letters and numbers is assigned to each mapped wetland. These letters and numbers describe the broad landscape context of the wetland, its vegetation type, its water regime, and the kind of alterations that may have occurred. Ancillary data layers such as topographic maps, digital elevation models, soils data, and other aerial imagery sources are also used to improve mapping accuracy. Wetland mapping follows the federal Wetland Mapping Standard and classifies wetlands according to the Cowardin classification system of the National Wetlands Inventory (NWI) (Cowardin et al. 1979, FGDC Wetlands Subcommittee 2013). Federal, State, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands differently than the NWI. Similar coding, based on U.S. Fish and Wildlife Service conventions, is applied to riparian areas (U.S. Fish and Wildlife Service 2009). These are mapped areas where vegetation composition and growth is influenced by nearby water bodies, but where soils, plant communities, and hydrology do not display true wetland characteristics. **These data are intended for use at a scale of 1:12,000 or smaller. Mapped wetland and riparian areas do not represent precise boundaries and digital wetland data cannot substitute for an on-site determination of jurisdictional wetlands.**

See a detailed overview, with examples, of both wetland and riparian classification systems and associated codes

Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79/31. Washington, D.C. 103pp.

Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.

U.S. Fish and Wildlife Services. 2009. A system for mapping riparian areas in the western United States. Division of Habitat and Resource Conservation, Branch of Resource and Mapping Support, Arlington, Virginia.

Introduction to Land Management

Within the report area you have requested, land management information is summarized by acres of federal, state, and local government lands, tribal reservation boundaries, private conservation lands, and federal, state, local, and private conservation easements. Acreage for "Owned", "Tribal", or "Easement" categories represents non-overlapping areas that may be totaled. However, "Other Boundaries" represents managed areas such as National Forest boundaries containing private inholdings and other mixed ownership which may cause boundaries to overlap (e.g. a wilderness area within a forest). Therefore, acreages may not total in a straight-forward manner.

Because information on land stewardship is critical to effective land management, the Montana Natural Heritage Program (MTNHP) began compiling ownership and management data in 1997. The goal of the Montana Land Management Database is to manage a single, statewide digital data set that incorporates information from both public and private entities. The database assembles information on public lands, private conservation lands, and conservation easements held by state and federal agencies and land trusts and is updated on a regular basis. Since 2011, the Information Management group in the Montana State Library's Digital Library Division has led the Montana Land Management Database in partnership with the MTNHP.

Public and private conservation land polygons are attributed with the name of the entity that owns it. The data are derived from the statewide Montana Cadastral Parcel layer Conservation easement data shows land parcels on which a public agency or qualified land trust has placed a conservation easement in cooperation with the land owner. The dataset contains no information about ownership or status of the mineral estate. For questions about the dataset or to report errors, please contact the Montana Natural Heritage Program at (406) 444-5363 or mtnhp@mt.gov. You can download various components of the Land Management Database and view associated metadata at the Montana State Library's GIS Data List at the following links:

Public Lands
Conservation Easements
Private Conservation Lands
Managed Areas

Map features in the Montana Land Management Database or summaries provided in this report are not intended as a legal depiction of public or private surface land ownership boundaries and should not be used in place of a survey conducted by a licensed land surveyor. Similarly, map features do not imply public access to any lands. The Montana Natural Heritage Program makes no representations or warranties whatsoever with respect to the accuracy or completeness of this data and assumes no responsibility for the suitability of the data for a particular purpose. The Montana Natural Heritage Program will not be liable for any damages incurred as a result of errors displayed here. Consumers of this information should review or consult the primary data and information sources to ascertain the viability of the information for their purposes.

Introduction to Invasive and Pest Species

Within the report area you have requested, separate summaries are provided for: Aquatic Invasive Species, Noxious Weeds, Agricultural Pests, Forest Pests, and Biocontrol species that have been documented or potentially occur there based on the predicted suitability of habitat. Definitions for each of these invasive and pest species categories can be found on our Species Status Codes page.

Each of these summaries provides the following information when present for a species: (1) the number of observations of each species; (2) the geographic range polygons for each species, if developed, that the report area overlaps; (3) predicted relative habitat suitability classes that are present if a predicted suitable habitat model has been created; (4) the percent of the report area that is mapped as commonly associated or occasionally associated habitat as listed for each species in the Montana Field Guide; and (5) links to species accounts in the Montana Field Guide. Details on each of these information categories are included under relevant section headers under the Introduction to Native Species above or are defined on our Species Status Codes page. In presenting this information, the Montana Natural Heritage Program (MTNHP) is working towards assisting the user with rapidly determining what invasive and pest species have been documented and what species are potentially present in the report area. We remind users that this information is likely incomplete as surveys to document introduced species are lacking in many areas of the state, information on introduced species has only been tracked relatively recently, the MTNHP's staff and resources are limited, and information is constantly being added and updated in our databases. **Thus, field verification by professional biologists of the absence or presence of species will always be an important obligation of users of our data.**

If you are aware of observation or survey datasets for invasive or pest species that the MTNHP is missing, please report them to the Program Coordinator bmaxell@mt.gov Program Botanist apipp@mt.gov or Senior Zoologist dbachen@mt.gov. If you have observations that you would like to contribute, you can submit animal observations using our online data entry system at mtnhp.org/AddObs or via Excel spreadsheets posted at mtnhp.org/observations.asp

Additional Information Resources

MTNHP Staff Contact Information

Montana Field Guide

MTNHP Species of Concern Report - Animals and Plants

MTNHP Species Status Codes - Explanation

MTNHP Predicted Suitable Habitat Models (for select Animals and Plants)

MTNHP Request Information page

Montana Cadastral

Montana Code Annotated

Montana Fisheries Information System

Montana Fish, Wildlife, and Parks Subdivision Recommendations

Montana GIS Data Layers

Montana GIS Data Bundler

Montana Greater Sage-Grouse Project Submittal Site

Montana Ground Water Information Center

Montana Index of Environmental Permits, 21st Edition (2018)

Montana Environmental Policy Act (MEPA)

Montana Environmental Policy Act Analysis Resource List

Laws, Treaties, Regulations, and Agreements on Animals and Plants

Montana Spatial Data Infrastructure Layers

Montana State Historic Preservation Office Review and Compliance

Montana Stream Permitting: a guide for conservation district supervisors and others

Montana Water Information System

Montana Web Map Services

National Environmental Policy Act

Penalties for Misuse of Fish and Wildlife Location Data (MCA 87-6-222)

U.S. Fish and Wildlife Service Information for Planning and Consultation (Section 7 Consultation)

Web Soil Survey Tool

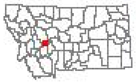
MONTANA
Natural Heritage Program

1515 East 6th Avenue
Helena, MT 59620
(406) 444-5363
mtnhp.org

Montana Field Guide

Other Observed Species

from Environmental Summary



Latitude	Longitude
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46.60343	-111.97782

Summarized by: 010N003W035 (Buffered PLSS Section)

Suggested Citation: Montana Natural Heritage Program. Environmental Summary Report. Custom Field Guide. Summarized by: 010N003W035 (Buffered PLSS Section). Retrieved on 6/23/2022.

Offline Field Guide

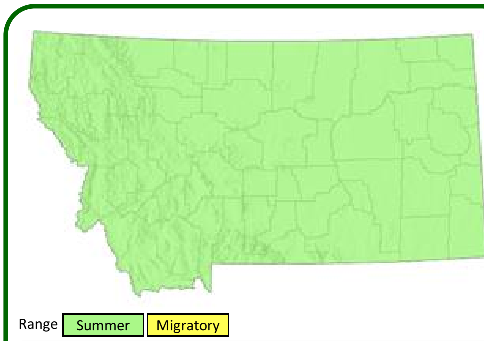
Note: This PDF version of the Montana Field Guide is intended to assist in offline identification and field work. It is not intended to replace the online Field Guide, as that version contains more information and is updated daily. For the most up-to-date information on Montana species, please visit **FieldGuide.mt.gov**

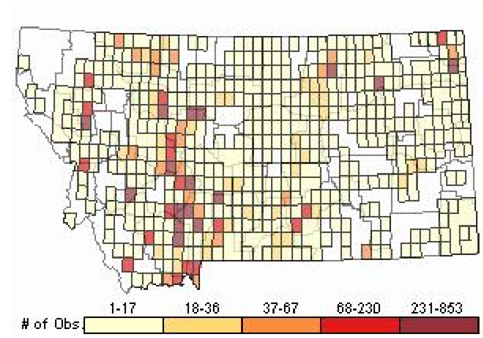
American White Pelican
Pelecanus erythrorhynchos

View in Field Guide

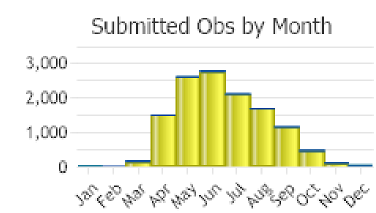
Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





 # Observations: 12959



General Description

The American White Pelican is a large, white bird (length: 127 to 165 cm; weight: most birds 5.0 to 9.0 kg; wingspan: 2.4 to 2.9 m) with black primaries and outer secondaries, an enormous bill with distensible gular pouch, and totipalmate webbed feet. It is often seen in flocks, and when in flight it flies with the head withdrawn. In the early breeding season the bill and legs are bright orange, the head has white plumes, and there is a laterally flattened horn on the upper mandible. Later the leg color fades, the head darkens, and the plumes and horn are lost (Evans and Knopf 1993).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The American White Pelican is unlike other North American birds, except the Brown Pelican (*Pelecanus occidentalis*), which does not occur inland, and is smaller with generally darker body plumage, and often forages by plunge-diving, whereas the American White Pelican does not (Evans and Knopf 1993). The Snow Goose (*Chen caerulescens*) and Whooping Crane (*Grus americana*) display contrasting black primaries and a white body when in flight, similar to the American White Pelican, but are quite different otherwise in appearance and behavior. Snow Geese are much smaller and fly with their neck extended. Whooping Cranes are often confused with American White Pelicans but are easily distinguished because they fly with their legs and neck extended.

Habitat

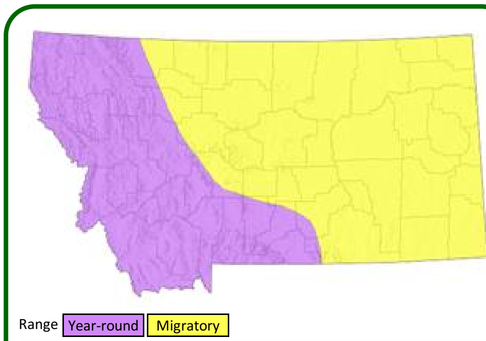
Habitat use in Montana appears similar to other areas within the breeding range. American White Pelicans occur on a variety of aquatic and wetland habitats, including rivers, lakes, reservoirs (both large and small), estuaries, bays, marshes, and sometimes in inshore marine habitats. These habitats are used variously for nesting, loafing, and feeding. They rest on islands and peninsulas, as well as exposed rocks in rivers. Nesting colonies usually are situated on islands or peninsulas in brackish or freshwater lakes, where they are isolated from mammalian predators. Nests are built on the ground in slight depressions or on mounds of earth and debris, usually on low, flat, or gently sloping terrain. They may use dredge spoil or natural islands. Usually nests are built in an open area, but often near vegetation, driftwood, or large rocks (Spendelow and Patton 1988). There is increasing concentration and feeding at catfish aquaculture operations during the non-breeding season (King and Grewe 2001).

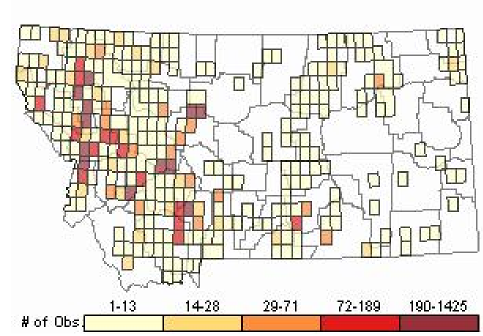
Montana breeding colonies are located in the eastern prairie regions on islands or peninsulas of low topographic relief at lakes and reservoirs. Cover at some colonies is minimal, with nests mostly or completely exposed, but nests are often under extensive stands of chokecherry (*Prunus virginiana*) in the main sub-colony at Medicine Lake (Hendricks and Johnson 2002). Feeding occurs near the colony as well as at remote locations (> 100 km) away from the colony in reservoirs, lakes, and along rivers.

Hooded Merganser
Lophodytes cucullatus [View in Field Guide]

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGIN
PIF: 2





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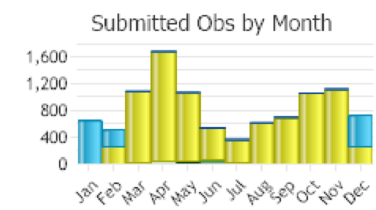


General Description

The Hooded Merganser is a small (length 46 cm) duck with a thin, serrated bill and a puffy crest. The adult male has a black head with a large white patch on each side, a dark back, brown flanks, and a white chest with two black bars on each side. The adult female is brownish overall, with a yellowish lower mandible. The first-winter male resembles the female. In flight, both sexes show black-and-white inner secondaries (Peterson 1980).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

They differ from other mergansers in being smaller, having white head patches (males), and by lacking a red bill. They differ from the Bufflehead by lacking white sides.

Habitat

Closely associated with forested wetland systems range-wide; a broad range of breeding habitats includes emergent marshes, small lakes, ponds, beaver wetlands, forested creeks and rivers, and swamps (Dugger et al. 2009). Hooded Mergansers are generally found in river areas bounded by woods and supporting good fish populations associated with clear water (Johnsgard 1992).

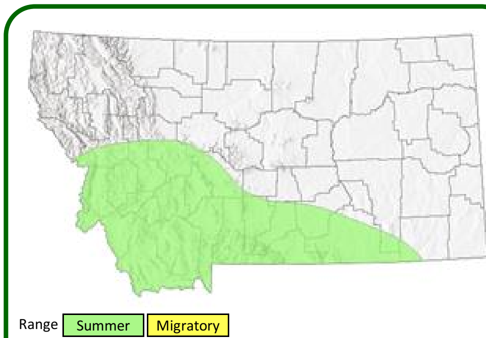
Broad-tailed Hummingbird

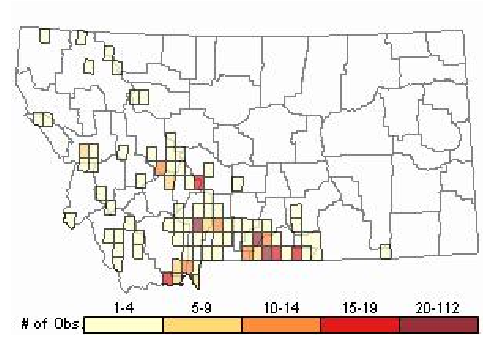
Selasphorus platycercus

View in Field Guide

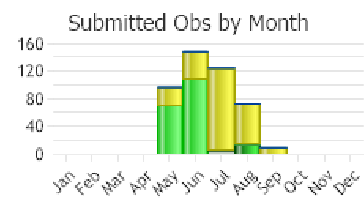
Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4B

Agency Status
USFWS: MBTA; BCC10
USFS:
BLM:
FWP SWAP: SGIN
PIF:





 # Observations: 452



General Description

A hummingbird of medium size, the Broad-tailed Hummingbird is fairly long-bodied, 9 cm (3.5 inches), and has a relatively long wingspan, 13 cm (5.25 inches). The female is generally the larger of the two sexes. The male has a rose-magenta throat patch, or gorget, while the throat of the female is white with varying amounts of speckling of faint bronze, iridescent green, or the rose-magenta feather color typical of the male's gorget. Both sexes have an iridescent green back and a long broad tail, the latter of which extends beyond the wingtips. The base of the outer tail feathers is rufous in color, beyond which a thin line of green is edged in a thicker band of black or purplish-black and terminated in white. The majority of the tail is green. The center of the male's breast is white, with green and buffy flanks, while the flanks of the female are primarily buff or pale cinnamon in color. The male has a line joining the white of the neck to white on the chin via a line at the back of the gorget traveling through the eye-ring. The eye-ring of the female is pale from which a pale white line travels behind the spotted cheeks to join the white throat (Calder and Calder 1992, Johnsgard 1986, Sibley 2000). The bill is black, iris brown, and feet dusky (Calder and Calder 1992).

Without a true song, vocalizations of the Broad-tailed Hummingbird are generally described as a "chitter, chitter, chitter" or "tiputi, tiputi," produced by the male to intruders into established territory, while females produce a similar sound when protecting nesting or feeding sites (Calder and Calder 1992, Sibley 2000). The long tapered wing tips on the male create a trill during flight. This is especially evident during territorial defense (and mating display) dives, which may descend from 40 feet. This sound is described as similar to the call of a Cedar Waxwing, or as a buzzy, insect-like trill (Johnsgard 1986, Sibley 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The broad, lengthy tail is the most notable feature that distinguishes the Broad-tailed Hummingbird from other hummingbird species. The Rufous Hummingbird has a tail primarily rufous in color, whereas the Broad-tailed Hummingbird's tail is dominated by green, black and white, with rufous coloration only the base of the outer tail feathers (Sibley 2000). The combination of the broad tail, overall larger size, and buff or buff-and-green flanks distinguish this from other hummingbird species common in the state.

Habitat

No specific habitat information is available for Montana. Reported use in surrounding states (Idaho, Wyoming, and Colorado) includes habitat similar to that found in Montana and may include ponderosa pine (*Pinus ponderosa*) and aspen (*Populus tremuloides*) groves, as well as mountain meadows and pinyon-juniper woodlands (Johnsgard 1986).

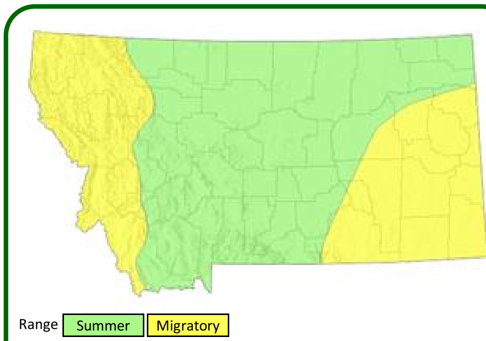
Elsewhere, the species is typically found in open woodland, especially pinyon-juniper, pine-oak, and conifer-aspen associations. The Broad-tailed Hummingbird can be found on brushy hillsides in montane scrub and thickets. During migration and winter, they may select open areas in lowlands replete with flowering shrubs. Movement to higher elevations after breeding is not uncommon (Johnsgard 1983).

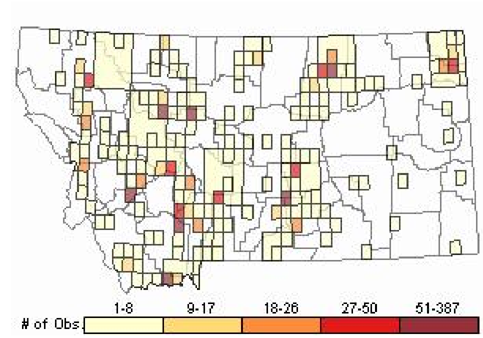
White-faced Ibis
Plegadis chihi

View in Field Guide

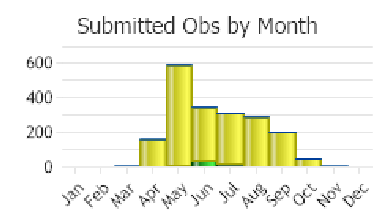
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





 # Observations: 1954



General Description

The White-faced Ibis is a medium-sized wading bird with dark maroon or brown plumage, a long neck and legs, and a long, decurved bill. Males are almost always larger than females and adults are larger than juveniles for the first 6 to 9 months (Ryder and Manry 1994). The adult body length ranges from 46 to 56 cm (18.1 to 22.0 inches) with wingspans ranging from 94 to 99 cm (37 to 39 inches). Weight varies ranging from 450 to 525 grams (1.0 to 1.2 lb.) and the bill length averages between 15 to 18 cm (6 to 7 inches) (Ryder and Manry 1994). Male and female plumages cannot be distinguished. In the adult breeding plumage, the head, neck, upper back, wing coverts, and undersides are a dark maroon or brown with a metallic green and bronze sheen. The head of the White-faced Ibis has bare facial skin that is reddish or purple. White feathers on the head separate the forehead from the face and also encircle the eye. The eye itself is red (Ryder and Manry 1994). The bill is cream with some shades of red (Pratt 1976) and the legs are bright red. The non-breeding plumage is similar to the breeding plumage without the presence of the white face feathers. Also, the overall plumage is less glossy (Oberholser 1974), and the bill and legs become an olive-gray color (Pratt 1976). The juvenile plumage has a fuscous foreneck and anterior surface. The back, tail and wings are a dull metallic, greenish-olive and often appears oily (Palmer 1962, Oberholser 1974). When observing immature White-faced Ibises, it can be extremely difficult to separate from the closely related Glossy Ibis.

White-faced Ibises have a limited vocalization array. Single birds, pairs, and flocks often give an "*oink oink*" or "*ka-onk ka-onk*" sound (Oberholser 1974). During nest building, they often give a guttural babbling sound. Vocalizations during interspecific aggression are long "*gheeeeeee*" sounds and the greeting call by the male to the female is a "*geeeeek, geeeeek, geeeeek*" sound (Belknap 1957).

White-faced Ibis eggs are elliptically-ovate to round shaped and range in color from a pale bluish-green to a deep turquoise, with no markings (Bent 1926, Belknap 1957, Kotter 1970, King et al. 1980). Dimensions average 51.2 to 52.26 mm by 36.0 to 37.0 mm (Kaneko 1972, Belknap 1957), and weights average 28.4 to 43.7 grams (Kotter 1970). White-faced Ibises are a single brood species, but will attempt to renest after an early nest failure.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The White-faced Ibis is very similar in appearance to the closely related Glossy Ibis and identification can be difficult. Distinguishing characteristics which separate the two species include the red iris versus a more brownish or dark iris, bright red legs versus more grayish ones, the bare facial skin colored red and trim of white feathers which surround the eye versus a darker face with only small white lines connecting the bill to the eye (Ryder and Manry 1994), and the olive-gray bill versus a more brown colored bill (Sibley 2000).

Habitat

The White-faced Ibis breeding habitat is typically freshwater wetlands, including ponds, swamps and marshes with pockets of emergent vegetation. They also use flooded hay meadows and agricultural fields as feeding locations. Ibises nest in areas where water surrounds emergent vegetation, bushes, shrubs, or low trees. In Montana, White-faced Ibises usually use old stems in cattails (*Typha* spp.), hardstem bulrush (*Scirpus acutus*) or alkali bulrush (*S. paludosus*) over shallow water as their nesting habitat (DuBois 1989). Water conditions usually determine whether nesting occurs in a particular area. Therefore, White-faced Ibis nesting sites can often move around from year to year. However, they are a fairly adaptable species and the primary breeding requirement is colony and roosting site isolation. During migration, White-faced Ibises use more varied habitats for resting and feeding sites, ranging from wooded streams, mudflats, and grassy fields to small marshes and sewage ponds (Duebbert 1968, Locatelli and Blankenship 1973, Ducey 1988, Baumgartner and Baumgartner 1992).

Montana Natural Heritage Program

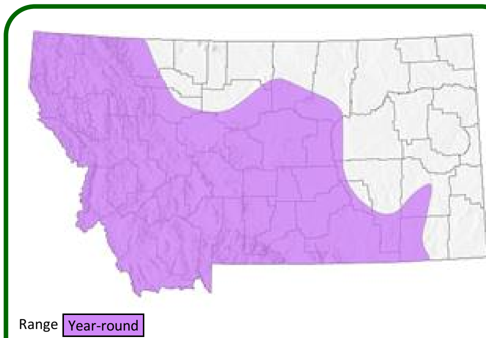
Cassin's Finch

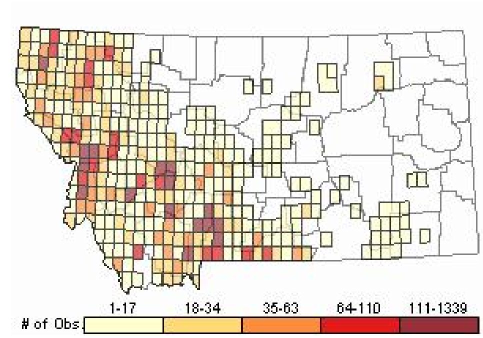
Haemorhous cassinii

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA; BCC10
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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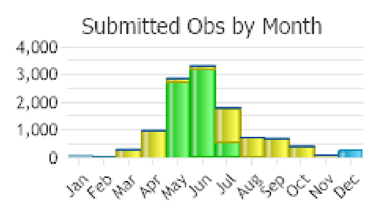


General Description

Cassin's Finch is the largest of the North American *Carpodacus* finches (includes Purple Finch and House Finch); length is 14.5-15.5 cm (5.7-6.1 inches). Adults are sexually dimorphic in plumate traits. Adult males have rose-red coloration on the head throat and upper breast, the crown is bright pinkish-red contrasting with the paler nape and back; rump and upper tail coverts are dull rose-pink and streaked with brown. The lower breast and belly appear generally whitish, the undertail coverts with fine brown streaks. Females have an overall brownsih plumage; the head has supercillium and submoustacial regions with fine brown streaks, back and rump dusky and streaked with brown, the throat, breast and flanks whitish with crisp brown streaks. Juneniles and immatures resemble females.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Male Cassin's Finch has fine streaking on the undertail coverts and flanks, in contrast to pure white of the Purple Finch. In females and immature males, breast and flanks more cleanly white and more finely streaked in Cassin’s Finch than in Purple Finch. Larger and more chunky than the House Finch. Red on male House Finch is usually brighter and oranger, not rose-red. Male Cassin's Finch is much less streaked on the lower breast and belly than male House Finch; female Cassin's Finch with a noticable supercilliary stripe lacking in female House Finches, and the breast streaking more distinct and less diffuse. Cassin's Finch the only of the three *Carpodacus* finches routinely encountered higher in the mountains.

Habitat

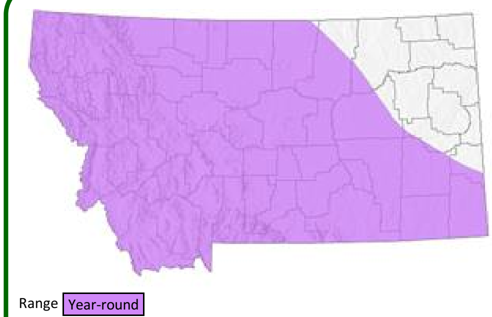
Cassin’s Finches occur in every major forest type and timber-harvest regime in Montana, including riparian cottonwood, but are especially common in ponderosa pine and postfire forests; they occur less often in lodgepole pine, sagebrush, and grassland (Manuwal 1983, Hutto and Young 1999). They often visit bird feeders and occasionally venture into alpine terrain (Johnson 1966, Pattie and Verbeek 1966).

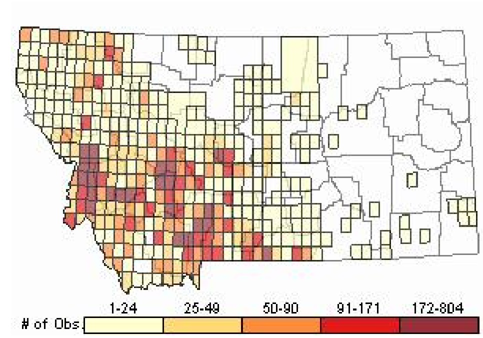
Clark's Nutcracker
Nucifraga columbiana

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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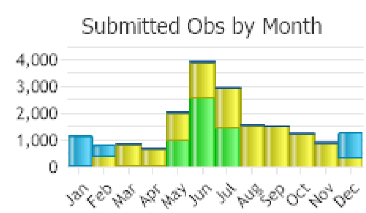


General Description

Clark's Nutcracker is a jay-sized corvid that is crowlike in build and flight, with moderate sexual size dimorphism. Total length of adults 27.0 to 30.1 cm. Mass 106 to 161 g. Males slightly larger than females. Sexes similar in appearance. Light to medium gray, with varying amounts of white around eyes, on forehead, and on chin; white around vent and at base of tail; wings and tail glossy black; secondaries broadly tipped with white forming a white patch; outer rectrices white. Folded wings nearly reach tip of tail. Long, pointed, black bill with short nasal bristles. Distinctive grating call audible at great distance (Tomback 1998).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Clark's Nutcracker is distinctive in appearance and behavior, and unlike any other corvid in Montana. Plumage is similar to that of the Northern Shrike and Northern Mockingbird, but the longer, straighter bill and larger body distinguish nutcrackers from these species. White and black markings in the wings and tail, in combination with the other body characters and the sharp grating "*craaaww*" call, help distinguish a nutcracker. Other similar-appearing species don't travel in conspecific flocks, as nutcrackers often do.

Habitat

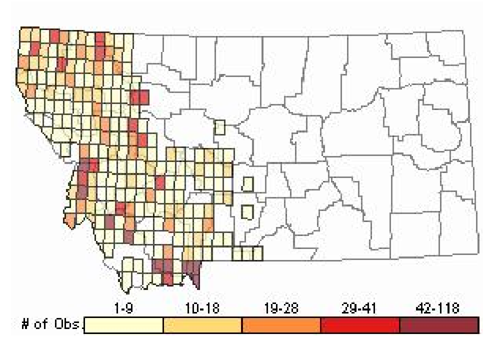
Nutcrackers in Montana typically occupy conifer forests dominated by whitebark pine at higher elevations and ponderosa pine and limber pine along with Douglas firs at lower elevations, relying largely on seeds of these species for food (Saunders 1921, Mewaldt 1956, Giuntoli and Mewaldt 1978). They often are seen above treeline in alpine meadows or flying among drainages (Johnson 1966, Pattie and Verbeek 1966).

Western Toad
Anaxyrus boreas

[View in Field Guide]

Species of Concern
Native Species
Global Rank: G4
State Rank: S2

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN2



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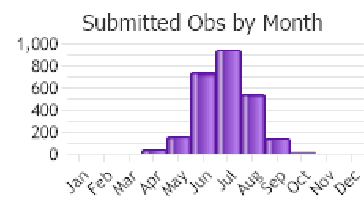


General Description

EGGS
Laid in long strings that are one to three (usually two) eggs wide in a zigzag pattern and contain 1,000 to more than 18,000 eggs (usually 6,000 to 12,000) (Livezey and Wright 1947, Samallow 1980, Olson 1988, Carey et al. 2000). Each ovum is black above, white below, and is surrounded by two jelly layers. Ovum diameters are 1.5 to 1.8 mm, but total egg diameters, including both jelly layers, are approximately 5 to 6.8 mm (Livezey and Wright 1947, Karlstrom 1962a, Maxell et al. 2002). In Montana, clutch size has been documented at 20,469 eggs in a 30 cm strand of two jelly layers. Egg were reported hatching in less than 7 days (Maxell et al. 2002).

LARVAE
Body and tail musculature are black or dark brown with either a black or gray belly (Maxell et al. 2009). The tail fins are both clear with dendritic pigmentation, with the dorsal tail fin having more pigmentation (Maxell et al. 2009). The anus is on the midline at the front end of the ventral tail fin. The eyes about midway between the dorsal midline and edge of the head. Labial tooth rows are 2/3, oral papillae are restricted to the sides of the mouth. Total length (TL) of 10-38 mm (Carpenter 1953, Corkran and Thoms 2006).

JUVENILES AND ADULTS
The skin is dry with a dorsal base color of olive green or light or dark brown with reddish or light brown color on the warts and small black spots over everything (Maxell et al. 2009). The warts may be reddish-brown and encircled by dark pigment. Ventral color is cream to tan mottled with numerous dark blotches. A white stripe extends down the center of the back in older individuals but may be absent or inconspicuous in juveniles (Maxell et al. 2009). Parotid glands are oval and larger than the eyes, located behind the eye and tympanum. Cranial crests are absent or indistinct. The eyes have horizontal pupils. The hind feet each have two light brown digging “spades” on their soles, but the spades lack a sharp cutting edge (Black 1970b, Maxell et al. 2009). Mature males have a dark patch on the inner surface of the innermost digit ("thumb") during breeding. Males lack a vocal sac; however, they may produce a repeated chirping sound. Snout-vent length (SVL) of 11-118 mm; with males rarely exceeding 95 mm SVL and females rarely 110 mm (Black 1970b, Maxell et al. 2009). Recently metamorphosed toadlets measure about 10 to 16 mm SVL but can be 16 to 20 mm (Maxell et al. 2002). Juveniles 20 to 35 mm SVL often are present in wetlands adjacent to breeding sites (Nussbaum et al. 1983, Hammerson 1999).

Diagnostic Characteristics

Adult Western Toad lack the prominent cranial crests found on the other species of Montana toads. The Woodhouse’s Toad (*Anaxyrus woodhousii*) have parallel cranial crests on the snout and behind the eyes in the shape of an “L”. Western Toad have horizontal rather than vertical pupils. Eggs and larvae of Western Toad tadpoles lack visible white or gold flecks on the back that are present in Woodhouse's and Great Plains Toad (*Anaxyrus cognatus*) tadpoles (Werner et al. 2004). Woodhouse's Toad ova are enclosed in a single jelly layer, not two, and Great Plains Toad eggs are in strings that are noticeably pinched between each egg (Bragg 1937a).

However, eggs and tadpoles of Western and Woodhouse's Toads are very similar and may be indistinguishable in some cases. Distribution is a useful character for all life stages. The geographic range of Great Plains Toad does not overlap with the geographic range of Western Toad. See the geographic range of Woodhouse's Toad for limited areas of possible overlap in a narrow area north of the Beartooth and Absaroka mountains (Maxell et al. 2003).

Habitat

The Western Toad is known to utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms (Brunson 1952, Carpenter 1953, Black 1970b, Campbell 1970c, Nussbaum et al. 1983, Baxter and Stone 1985, Russell and Bauer 1993, Koch and Peterson 1995, Cavallo 1997, Hart et al. 1998, Hammerson 1999). Forest cover around occupied montane wetlands may include Aspen (*Populus tremuloides*), Douglas-fir (*Pseudotsuga menziesii*), Lodgepole Pine (*Pinus contorta*), Engelmann Spruce (*Picea engelmannii*), and Subalpine Fir (*Abies lasiocarpa*); in local situations it may also be found in Ponderosa Pine (*Pinus ponderosa*) forest. They also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson 1999). Normally they remain close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night.

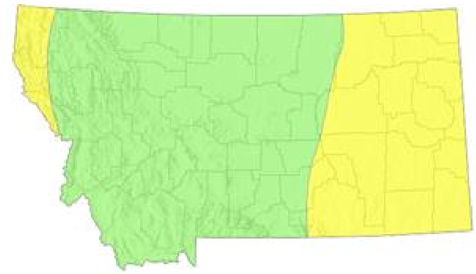
Habitats used by Western Toads in Montana are similar to those reported for other regions, and include low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near the treeline (Rodgers and Jellison 1942, Brunson and Demaree 1951, Miller 1978, Marnell 1997, Werner et al. 1998a, Boundy 2001). Forest cover in or near encounter sites is often unreported, but Western Toads have been noted in open-canopy Ponderosa Pine woodlands and closed-canopy dry conifer forest in Sanders County (Boundy 2001), Willow (*Salix* spp.) wetland thickets and Aspen stands bordering Engelmann Spruce stands in Beaverhead County (Jean et al. 2002), and mixed Ponderosa Pine/Cottonwood/Willow sites or Douglas-fir/Ponderosa Pine forest in Ravalli and Missoula counties (Paul Hendricks, personal observation).

Black-necked Stilt
Himantopus mexicanus

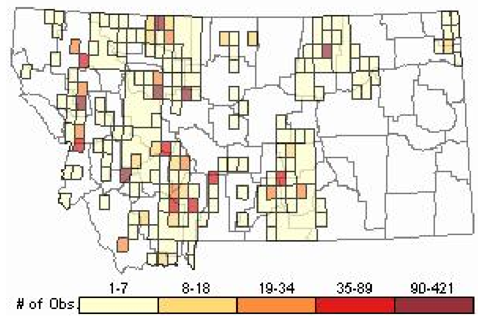
View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

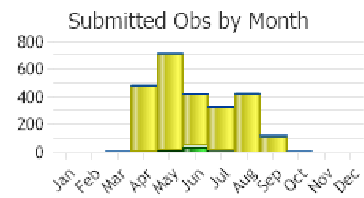
Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3



Range Summer Migratory



 # Observations: 2496



General Description

The Black-necked Stilt is a tall, slender wader with a long, straight, and slender bill, the upperparts glossy black (male) or duller black tinged with brown (female) with a white spot above the eye, underparts white, the legs and feet very long and red or pink. The iris is red. Immatures have buffy edges on the dark brown feathers of the upperparts.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The black and white plumage and very long red legs of this species are unique and diagnostic.

Habitat

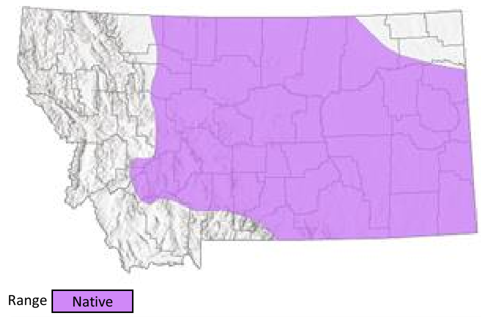
Black-necked Stilts breed on the edges of shallow marshes, often on islands, building a scrape that is lined with vegetation, pebbles, and feathers. Nests may be out in the open or among low vegetation and are usually within 50 m of water (Robinson et al. 1999). Taking full advantage of their long legs, almost all feeding occurs in the water. In Montana, Black-necked Stilts nest in medium to large wetland complexes of open marshes and meadows, often in alkali wetlands. Habitats used during migration similar to those used in other seasons, but they also occur on coastal mud flats.

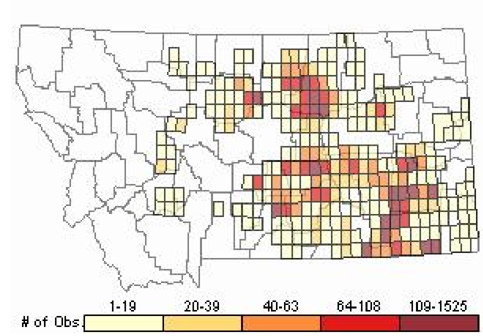
Black-tailed Prairie Dog
Cynomys ludovicianus

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3





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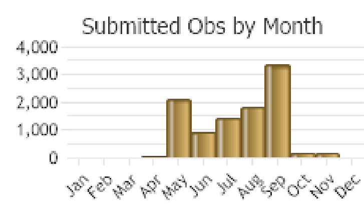


General Description

The Black-tailed Prairie Dog is the largest of the prairie dog species, weighing 700 to 1500 grams and measuring 28 to 33 centimeters from nose to tail (Burt and Grossenheider 1976, Hoogland and Foltz 1982). The overall color of the back and upper sides of the body and tail is generally dark cinnamon with buff coloring on the underside (Anderson 1972, Burt and Grossenheider 1976, Hall 1981). The distal third of the tail is black or dark brown (Hall 1981). They molt twice per year, prior to summer and prior to winter. The skull is about 60 centimeters long, with 22 teeth (Burt and Grossenheider 1976).

Diagnostic Characteristics

Black-tailed Prairie Dogs are easily separated from the similar White-tailed Prairie Dogs by the black color of the distal one-third of the tail tip. The Black-tailed Prairie Dog also lacks the distinctive dark face patches of the White-tailed Prairie Dog. Black-tailed Prairie Dogs are also found in more dense colonies than are White-tailed Prairie Dogs. Features of the skull and teeth can also be used to separate the two species of prairie dogs in Montana (Foresman 2012).

Black-tailed Prairie Dogs may also be confused with a number of ground squirrel (*Spermophilus*) species, but are distinguished by their much more robust body conformation and relatively short tail and their habit of living in much denser colonies with more developed burrow systems.

Habitat

Black-tailed Prairie Dog colonies are found on flat, open grasslands and shrub/grasslands with low, relatively sparse vegetation. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama and big sagebrush (Montana Prairie Dog Working Group 2002). Colonies are associated with silty clay loams, sandy clay loams, and loams (Thorp 1949, Bonham and Lerwick 1976, Klatt and Hein 1978, Agnew et al. 1986) and fine to medium textured soils are preferred (Merriam 1902, Thorp 1949, Koford 1958), presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils. Encroachment into sands (e.g., loamy fine sand) occurs if the habitat is needed for colony expansion (Osborn 1942).

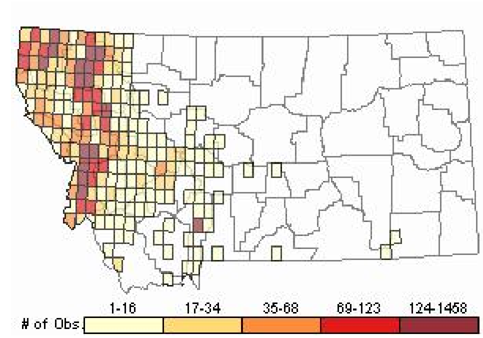
Shallow slopes of less than 10% are preferred (Koford 1958, Hillman et al. 1979, Dalsted et al. 1981), presumably in part because such areas drain well and are only slightly prone to flooding. By colonizing areas with low vegetative stature, Black-tailed Prairie Dogs often select areas with past human (as well as animal) disturbance. In Montana, colonies tended to be associated with areas heavily used by cattle, such as water tanks and long-term supplemental feeding sites (Licht and Sanchez 1993, FaunaWest 1998).

Pileated Woodpecker
Dryocopus pileatus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 2



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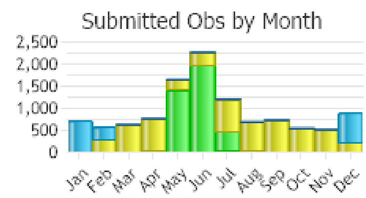


General Description

A crested, black woodpecker with wing span of about 70 cm. More or less uniformly black body with a white line extending down the neck from the bill to underwing area; white throat and line above the eye; black through the eye. Male with a vivid red crest extending from the bill to the nape and a red moustache mark extending from the bill. Female slightly smaller than male and with gray to brown forehead, red crest, and no red moustache mark. In all sex and age groups, a few gray-white bars can be found on the flanks. In flight, wings show black leading and trailing edges and white near the center of the wing close to the body. Juveniles have duller, more loosely textured feathers; primary 10 is longer, broader, and less pointed. Voice a loud, characteristic "*kuk-kuk-kuk-kuk*" drumming a deep resonant roll that carries a kilometer or more (Bull and Jackson 1995).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Except for the probably extinct Ivory-billed Woodpecker (*Campephilus principalis*) of the southeastern United States and Imperial Woodpecker (*C. imperialis*) of montane western Mexico, the Pileated Woodpecker is the largest woodpecker in North America. Large size and prominent red crest distinguish this woodpecker from all other woodpecker species in Montana.

Habitat

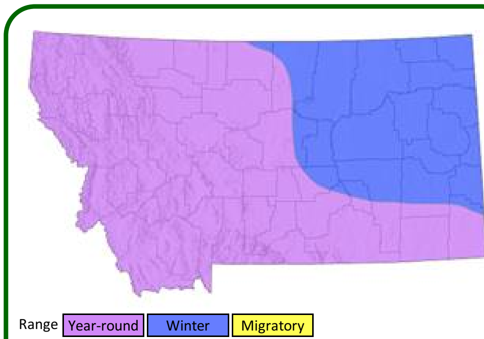
Late successional stages of coniferous or deciduous forest preferred, but also younger forests that have scattered, large dead trees (Bull and Jackson 1995). In forests of northwestern Montana dominated by western larch and Douglas-fir, Pileated Woodpecker nests (113 in 97 trees) were in western larch (52), ponderosa pine (18) black cottonwood (15), trembling aspen (7), western white pine (3), grand fir (1), and Douglas-fir (1). Nest-tree diameter at breast height (DBH) averaged 73 cm (29 in) and height averaged 29 m (95 ft). Roost trees were similar to nest trees; both typically were snags (81% and 78%, respectively) with broken tops (77% in both categories). Old-growth stands containing western larch were common nesting sites; old-growth ponderosa pine, black cottonwood and trembling aspen were locally important but more restricted in distribution (McClelland and McClelland 1999).

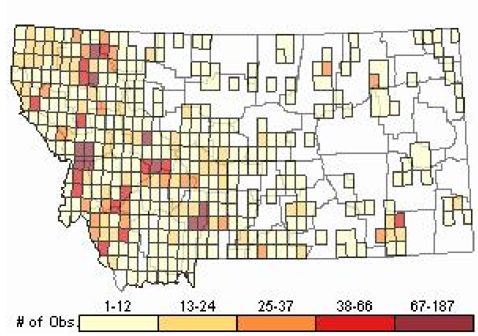
Northern Goshawk
Accipiter gentilis

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 2





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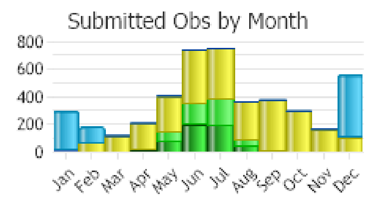


General Description

The Northern Goshawk is a fairly large hawk with a long tail having a broad, dark sub-terminal band and three to four narrower dark bands, rounded wing tips, and a conspicuous pale eyebrow. The sexes are similar with adults having a dark crown, blue-gray back, white underparts with fine, dense gray barring and conspicuous white undertail coverts. The eyes of adults are deep ruby-red and the feet are yellow. Immature Northern Goshawks are brown above, buffy below, with dense, blurry streaking. The undertail coverts are dark-streaked and the tail has wavy dark bands bordered with white and a thin white tip. The eyes of immature Northern Goshawks are yellowish, deepening in color to red as they mature. The total length is 53 to 66 cm, with females averaging larger than males (Squires and Reynolds 1997).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Northern Goshawk is the largest and heaviest bodied of the three North American accipiters. Goshawks are clearly larger than Sharp-shinned Hawks (*Accipiter striatus*). Male Northern Goshawks can be of similar size to female Cooper's Hawks (*Accipiter cooperi*), but Northern Goshawks have broader wings and a relatively short tail compared to Cooper's Hawks (Squires and Reynolds 1997). Their ventral surface is pale rather than rust-colored as well. They can be distinguished from both Sharp-shinned and Cooper's Hawks by their whiteish underside as well as a boldly patterned head with a strong, white superciliary line above the eye (Sibley 2000). Juvenile Northern Goshawks can be distinguished from juvenile Cooper's Hawks by their conspicuous pale superciliary line (Squires and Reynolds 1997), overall buffy wash appearance on the breast and belly (Sibley 2000), uneven tail-bands creating a zig-zag pattern when the tail is spread (Squires and Reynolds 1997) and overall paler and more patterned upperside (Sibley 2000). Northern Goshawks can be discerned from falcons by their shorter, more rounded wings, and alternating flap-and-glide flight pattern.

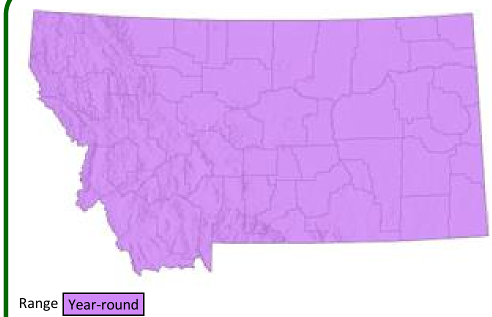
Habitat

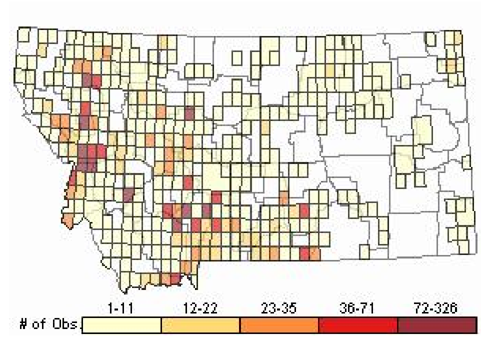
Goshawks nest in a variety of forest types in Montana, including Douglas-fir and Western Larch west of the Continental Divide, Lodgepole Pine in Beaverhead County, and Ponderosa Pine in Powder River and Carter counties. They prefer mature and old-growth forests with a preponderance of large trees, a dense canopy, and a relatively open understory (Hayward and Escano 1989, Squires and Reynolds 1997, Clough 2000). An exception to this generality is in Beaverhead County, where nests commonly occur in Lodgepole Pine stands with an average tree diameter of only 13 cm, although the birds usually place their nests in larger trees within these stands (Kirkley 1996). The nest is a bulky platform of sticks placed near the main trunk of a large tree from 6-20 m off the ground, usually in the lower part of the canopy. Forest stands where Northern Goshawks nest in Montana tend to be mature large-tract conifer forests with a high canopy cover (69%), relatively steep slope (21%), and little to sparse undergrowth (Kirkley 1996). Hayward and Escano (1989) examined nest-site characteristics at 17 territories in western Montana and northern Idaho in 1983. The birds nested preferentially in mature and old-growth stands of conifers that had a closed canopy (75-85% canopy cover) and a large forest opening within 1 km of the nest. Nest heights ranged from 7-17 m, and most nests were placed next to the main trunk in the lower one-third of the canopy. All Northern Goshawk nest trees reported by Kirkley (1996) were either Lodgepole Pine or Douglas-fir with an average DBH (diameter at breast height) of 33.6 cm and average height of 21.9 meters. In another study conducted in Montana, Douglas-fir, Ponderosa Pine and Grand Fir were the trees selected most often for nest building (State of Idaho HCA/CS Dev. Team 1995). Nests were constructed an average 10.9 meters above the ground and were usually located near water (232 m) or a clearing (85 m) (Kirkley 1996). Range-wide nest site characteristics are similar. Almost no information is available regarding Northern Goshawk foraging strategies in Montana. It is known they hunt in closed canopy habitats as well as more open landscapes and over 50 species of identified prey indicate they are generalists in terms of prey selection. Little information exists concerning Northern Goshawk non-breeding or wintering habitat in the state. However, in the Bozeman area, birds coming into the valley are found in forested or thickety areas. Multiple observations of wintering Northern Goshawks are documented in the north-central and northeastern areas of Montana (Montana Bird Distribution Committee 2012), possibly indicating movement toward areas of higher prey availability.

Peregrine Falcon
Falco peregrinus
View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS: MBTA
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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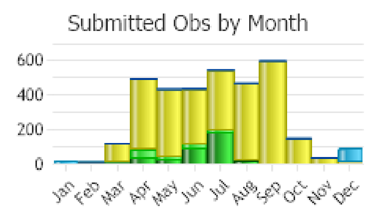


General Description

The Peregrine Falcon has long pointed wings, a dark crown and nape, and a dark wedge extending below the eye. The forehead is pale in immature birds, which are mainly brownish above rather than black or gray as in adults. Arctic birds are relatively pale, and the Peregrine Falcons of the northwest coast of North America are very dark, compared to the intermediate coloration of the subspecies (*anatum*) that once ranged across North America. They average 41 to 51 cm long and 91 to 112 cm in wingspan.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Smaller and less stocky in appearance than Gyrfalcons. Juvenile Peregrine Falcons are similar in size to Prairie Falcons, but are darker in color and have a heavy dark wedge on the side of the face.

Habitat

Nests typically are situated on ledges of vertical cliffs, often with a sheltering overhang. Ideal locations include undisturbed areas with a wide view, near water, and close to plentiful prey. Substitute man-made sites can include tall buildings, bridges, rock quarries, and raised platforms.

In fall in the Bozeman area, birds have been seen following flocks of shore birds at the lakes (Skaar 1969).

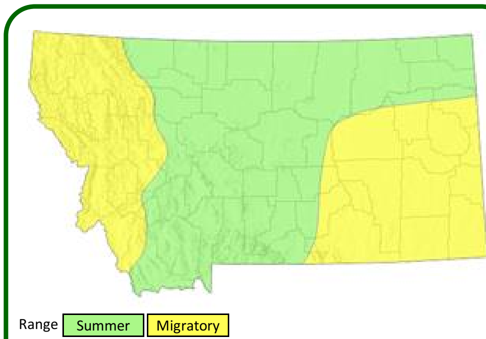
Franklin's Gull

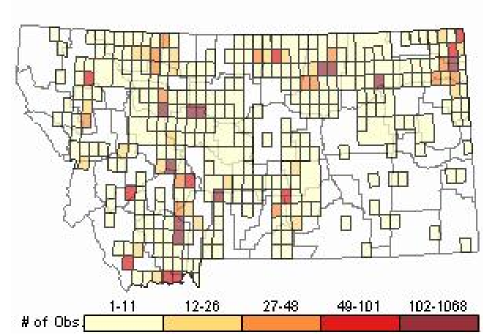
Leucophaeus pipixcan

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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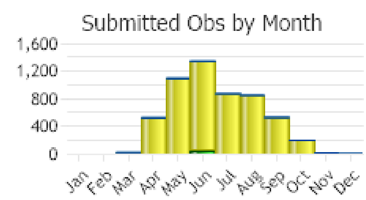


General Description

The Franklin's Gull is a small gull of wetlands in the interior of North America. In breeding plumage, this species has a black hood and a dark red bill with a black mark near the tip. The dark gray of the back extends to the upperpart of the wings. The underparts of the bird, including the wings, are white. The hindneck, the area between the black hood and the gray back, is also white. The underparts are sometimes tinged with pink, a coloration that earned the species the early name of Rosy or Prairie Dove (Burger and Gochfeld 1994). The legs are brownish-black or dusky (Burger and Gochfeld 1994). Broad white arcs directly above and below the black eye are apparent during the breeding season. The gray wings are tipped with a white band, then a black margin, and ultimately with large white primary ends.

In non-breeding plumage, the species loses the redness in the bill, and it becomes black. The black hood is reduced to an area from the eye to the back of the head, revealing a white forehead, throat, and splotchy crown. The bird averages 37 cm (14.5 inches) long with a wingspan of 91 cm (36 inches); the male tends to be slightly larger than the female (Sibley 2000). The vocalization of the Franklin's Gull is described as a nasal, laughing, hollow sound. A "*kowii*" or "*queel*" are used to define the common call (Sibley 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The most likely species with which the Franklin's Gull could be confused is the Laughing Gull, a rare species in Montana. The Franklin's Gull is slightly smaller, with proportionately smaller legs and bill. The bill is thinner and does not droop at the tip as it does on the Laughing Gull (Burger and Gochfeld 1994). The arcs of white around the Franklin's Gull's eye are more apparent as are the large white primary tips of the wings; the wingtips on the Laughing Gull have white on them, but the white is small and is not always evident (Sibley 2000). Differentiating the Franklin's Gull from the Bonaparte's Gull can be made by several distinguishing features. The Franklin's Gull is larger; the bill color is red in the Franklin's Gull compared to black in the Bonaparte's Gull; and unlike the indistinct white around the Bonaparte's Gull's eye, the white eye-arcs of the Franklin's Gull are obvious (Sibley 2000).

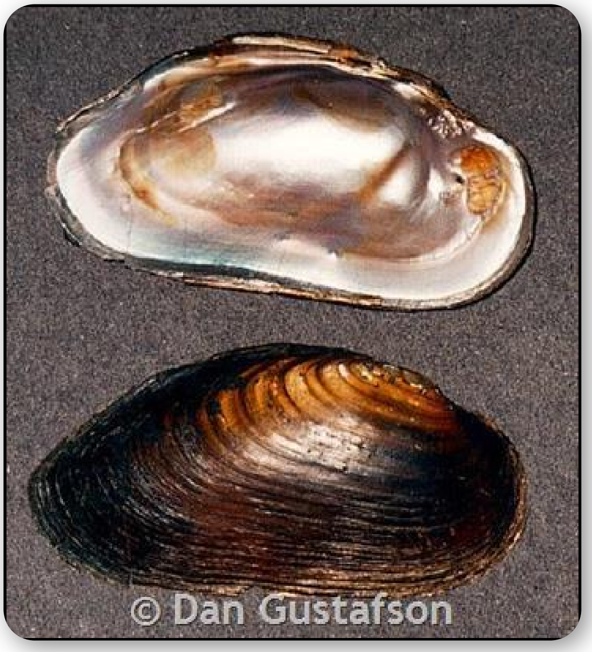
Habitat

Preferring large, relatively permanent prairie marsh complexes, the Franklin's Gull builds its nests over water on a supporting structure of emergent vegetation. Nesting is noted to occur in cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) (Berger and Gochfeld 1994). Typical water depth is 30 to 60 cm. Nesting over water differs from the nesting habits of Montana's other, generally ground nesting, gulls (Johnsgard 1992). Franklin's Gulls prefer to nest at sites with intermediate vegetation density, interspersed with open water of various sizes (Burger and Gochfeld 1994). Preferred nesting sites within a wetland can change from year to year because of changes in water level and associated changes in vegetation (Burger and Gochfeld 1994). One key feature of selected nesting sites is that the water levels remain high enough throughout the nesting period, or at least until the young can fledge, in order to provide protection from predators (Casey 2000). During migration, including the

Bozeman area, the Franklin's Gull can be found feeding on dry land, especially in cultivated fields prior to planting (Skaar 1969, Johnsgard 1992).

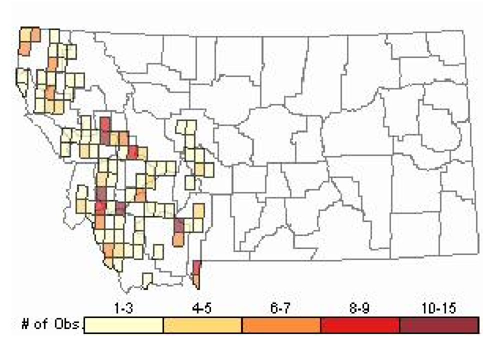
Western Pearlshell
Margaritifera falcata

View in Field Guide



Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN2



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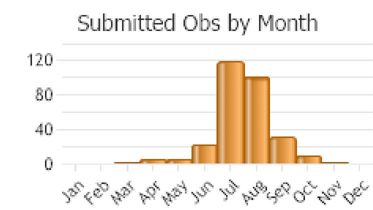


General Description

The Western Pearlshell is Montana's only coldwater trout stream mussel, and the only native mussel found on the west-side of the state (west of the Continental Divide). Populations of this mussel on the east-side of the divide in Montana reflect the declining distribution pattern of it's host fish (Westslope Cutthroat Trout). The shell of *M. falcata* is elongate, compressed, dark colored, and slightly concave on the ventral edge, oftentimes erosion marks are prominent on the umbo region (see photo). It has weakly developed teeth and a purple nacre (see photo). The typical size is 50 to 85 mm (2-3 inches) with larger older specimens surpassing 10 cm. In Montana, this species is similar to the introduced mussel, *Ligumia recta*, which is larger, thicker, has better developed teeth, pink nacre and occurs only in warmer rivers much further downstream. Since these species occur in very different habitats the likelihood of misidentifying *M. falcata* in Montana is virtually impossible.

Diagnostic Characteristics

"Similar to *M. margaritifera* except smaller (maximum length 125 mm) with purple rather than white or whitish nacre, relatively smaller anterior pseudocardinal tooth in left valve, and muscle scars in beak cavity entirely visible from below. Hermaphroditic, whereas in *M. margaritifera* the sexes are separate" (Clarke 1981). The shell of *M. falcata* is elongate, compressed, dark colored, and slightly concave on the ventral edge, oftentimes erosion marks are prominent on the umbo region (see photo). It is the smallest mussel species in Montana and the only one known west of the continental divide. It has weakly developed teeth and a purple nacre (see photo). The normal size is 50 to 85 mm with larger older specimens surpassing 10 cm. In Montana, this species is similar to *Ligumia recta*, which is larger, thicker, has better developed teeth, pink nacre and occurs only in warmer rivers much further downstream. Since these species occur in very different habitats the likelihood of misidentifying *M. falcata* in Montana is virtually impossible.

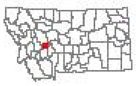
Habitat

The species is found in cool and cold running streams that generally have a low to moderate gradient and are wider than 2 m; preferred habitat is stable sand or gravel substrates. It is found in hard as well as soft water, unlike *M. margaritifera* (Clarke 1981). In large Idaho river systems (Salmon and Clearwater River Canyons), *M. falcata*, attains maximum density and age in river reaches where large boulders structurally stabilize cobbles and interstitial gravels. Boulders tend to prevent significant bed scour during major floods, and these boulder-sheltered mussel beds, although rare, may be critical for population recruitment elsewhere within the river, especially after periodic flood scour of less protected mussel habitat. In Idaho's Salmon and Snake River canyon, where reaches are aggrading with sand and gravel, *M. falcata* is being replaced by *Gonidea angulata*.

MONTANA
Natural Heritage Program
1515 East 6th Avenue
Helena, MT 59620
(406) 444-5363
mtnhp.org

Other Potential Species

from Environmental Summary



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Summarized by: 010N003W035 (Buffered PLSS Section)

Suggested Citation: Montana Natural Heritage Program. Environmental Summary Report. Custom Field Guide. Summarized by: 010N003W035 (Buffered PLSS Section). Retrieved on 6/23/2022.

Montana Field Guide

Offline Field Guide

Note: This PDF version of the Montana Field Guide is intended to assist in offline identification and field work. It is not intended to replace the online Field Guide, as that version contains more information and is updated daily. For the most up-to-date information on Montana species, please visit **FieldGuide.mt.gov**

The Montana Natural Heritage Program is part of the Montana State Library's Natural Resource Information System. Since 1985, it has served as a neutral and non-regulatory provider of easily accessible information on Montana's species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. The program is part of NatureServe, a network of over 80 similar programs in states, provinces, and nations throughout the Western Hemisphere, working to provide current and comprehensive distribution and status information on species and biological communities.

Montana Natural Heritage Program · Montana State Library · NatureServe

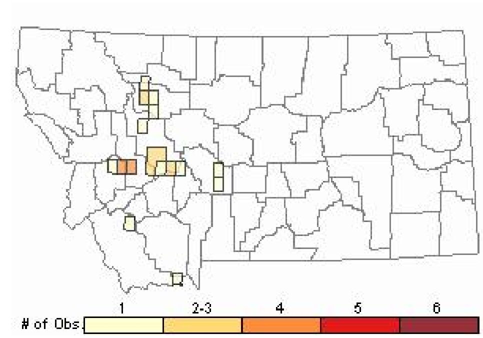
Hare's-foot Locoweed
Oxytropis lagopus var. conjugans

View in Field Guide

No photos are currently available

Potential Species of Concern
Native Species
Global Rank: G4G5T3T4
State Rank: S3S4

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value:



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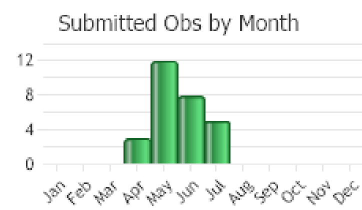


General Description

Information on this species is incomplete.

Phenology

Flowering May to June, fruiting in July.

Habitat

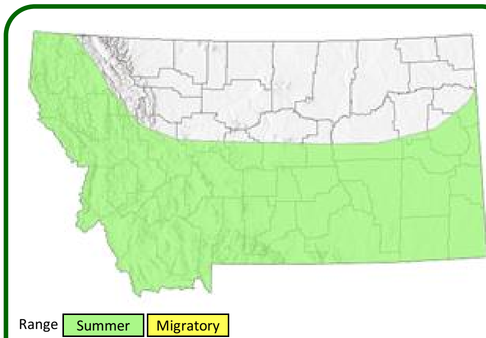
Sagebrush plains to lower mountains.

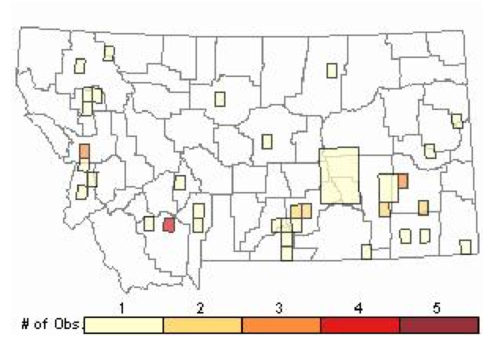
Yellow-billed Cuckoo
Coccyzus americanus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: PS: LT; MBTA
USFS:
BLM: THREATENED
FWP SWAP: SGCN3, SGIN
PIF: 2





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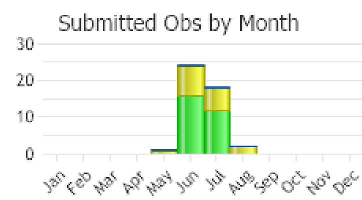


General Description

A slender bird with a long, distinctly patterned tail and white throat and breast. The back and head of the Yellow-billed Cuckoo are a plain grayish-brown. Consistent with its common name, the stout, somewhat curved bill is primarily yellow (the upper mandible is mostly black, with some yellow, while the lower mandible is yellow in its entirety). The boldly white and black patterned outer tail feathers, or rectrices, which from underneath give the appearance of 6 large white spots, can generally be observed during perching and in flight. The rufous primary feathers of this cuckoo are largely only visible in flight. The bird is generally 26 to 30 cm in length and weighs an average 55 to 65 grams (Hughes 1999). Females are slightly larger than males. The feet of the Yellow-billed Cuckoo are similar to that of the woodpeckers; they are zygodactylous; the two outer toes point backward while the two inner toes point forward (Hughes 1999).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Characteristics of the Black-billed Cuckoo (*C. erythropthalmus*), may cause some uncertainty in identification. In addition to a completely black bill, however, the Black-billed Cuckoo has a buffy throat, small distinct white tips on the rectrices (not large and obvious as on the Yellow-billed Cuckoo), little to no rufous on the wings, and a red orbital ring around the eyes. The juveniles are more easily confused (see Hughes 1999, for a comparative description of juvenile birds).

Habitat

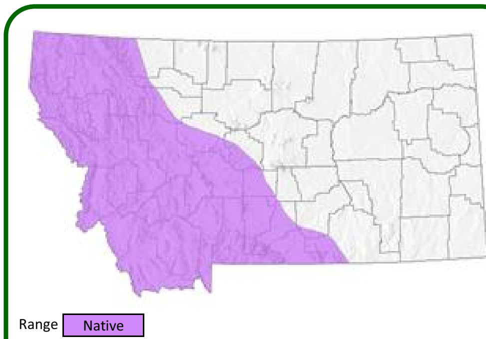
Throughout their range, preferred breeding habitat includes open woodland (especially where undergrowth is thick), parks, and deciduous riparian woodland. In the West, they nest in tall cottonwood and willow riparian woodlands. Nests are found in trees, shrubs or vines, an average of 1 to 3 meters above ground (Harrison 1979). Western subspecies require patches of at least 10 hectares (25 acres) of dense, riparian forest with a canopy cover of at least 50 percent in both the understory and overstory. Nests are typically found in mature willows (Biosystems Analysis, Inc. 1989). This bird is rarely found at higher elevations (Johnsgard 1986).

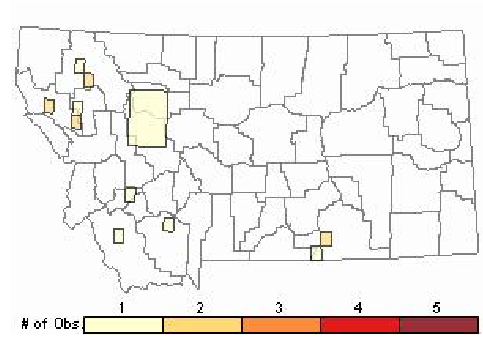
Panic Grass
Dichanthelium acuminatum

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 2
C-value: 9





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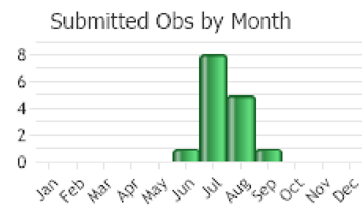


General Description

PLANTS: Cool season, bunched, perennial grass, 10-30 cm tall. Plants have a large showy, dark panicle which greatly exceeds the cauline leaves at reproductive maturity.

LEAVES: Basal and cauline alike, generally 5 to 10 mm wide, the 4-7 cauline with a ligule of long (2-6mm) hairs. Fall shoots arising from all but the upper nodes.

INFLORESCENCE: A diffuse, open panicle. The panicle may appear dark due to the second glume becoming purplish at maturity. **Spikelets** 1.5–2 mm long with 1 fertile floret. **Glumes** hairy and unequal in length. First glume 0.5–0.75 mm long and second glume 1.5–2 mm long. **Lemmas** are blunt, globe-like. **Palea** is enclosed in the floret.

Montana plants are subspecies *sericeum* (Lesica et al. 2012).

Sources: Lesica et al. 2012; Freckman & Lelong *in* FNA 2007; Flora of the Great Plains (1986).

Diagnostic Characteristics

Dichanthelium has been segregated from ***Panicum***. Montana has 3 species of *Dichanthelium*. Members of *Dichanthelium*:
* Develop a rosette of short, broad basal leaves during the cool season, while *Panicum* species do not.
* Grow during the cool and warm seasons, whereas, *Panicum* species grow in the warm season.
* Produce cleistogamous (self-pollinating) florets, which are often found on small axillary inflorescences during the late summer to fall.

Panic Grass – *Dichanthelium acuminatum* subsp. *sericeum*, native, SOC
* Stems 10-30 cm tall.
* Spikelets 1.5-2.5 mm long.
* At maturity the larger second glume is often purplish.
* Upper and lower leaf surfaces hairy.
* Ligules 2-6 tall.
* Often in wet soils around hot springs.

Wilcox's Panic Grass – *Dichanthelium wilcoxianum*, native
* Stems 10-20 cm tall.
* Spikelets less than 2.5 mm long.
* Upper and lower leaf surfaces hairy.
* Ligules 1.0 mm or less tall.
* Grasslands and open Ponderosa Pine forests in eastern Montana.

Scribner's Panic Grass – *Dichanthelium oligosanthes* var. *scribnerianum*, native, SOC
* Stems 20-50 cm tall.

* Spikelets 2-5 mm long.
* Upper leaf surface is glabrous. Lower leaf surface is hairy.
* Ligules 1-3 mm tall.
* Disturbed sites and open understory in northwest and southeast Montana.

Switchgrass (*Pancium virgatum*) is a rhizomatous, perennial grass while Montana's other ***Panicum*** species are annuals.

Habitat

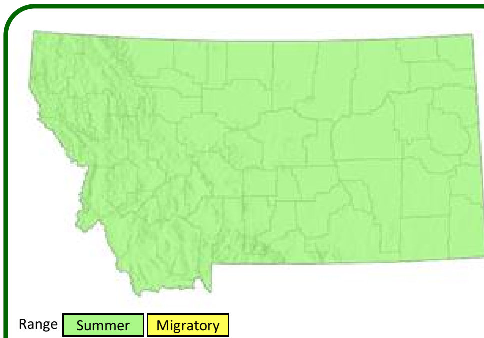
Often forming dense stands on wet soils around edges of hot springs (Lesica et al. 2012).

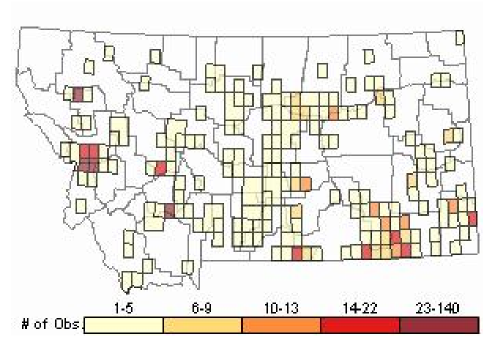
Common Poorwill
Phalaenoptilus nuttallii

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGIN
PIF: 3





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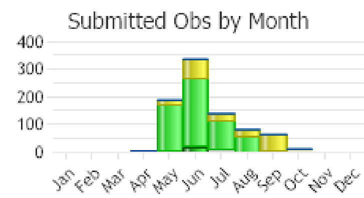


General Description

Small (19-21 cm long and 31-58 g). Head large and flattened, large eyes, small bill with immense gape. Short and rounded tail and wings. Plumage soft brown and gray streaked with black and white; underside is paler. Broad white band crosses dark throat and chest. Rectrices in males have white tips, buff colored in females. Plumage does not change seasonally. Noted for its distinctive “poor-will” call. (Woods et al. 2005)

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Distinguished from the Common Nighthawk by its lack of white wing stripe, presence of rictal bristles, and white or buff colored tail tips. (Woods et al. 2005)

Habitat

Dry, open, grassy or shrubby areas; high rolling prairies, semi-arid flats, and rocky foothills (Woods et al. 2005).

MONTANA Natural Heritage Program

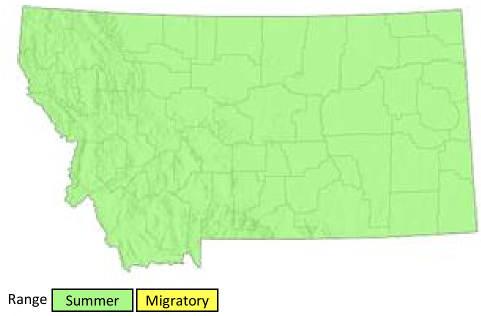
Long-billed Curlew

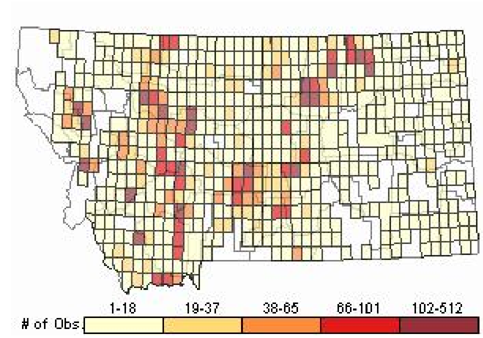
Numenius americanus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC11
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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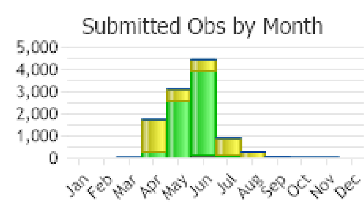


General Description

The Long-billed Curlew is the largest shorebird in North America. It is considered an endemic to the Great Plains. The Long-billed Curlew's long, decurved bill is adapted for capturing invertebrates living in mudflats on its wintering grounds (Dugger and Dugger 2002). Its familiar "*curlew*" call can be heard throughout the mixedgrass prairie of Montana during the spring and summer.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

Migrants arrive in Montana late March to mid-April. Adults observed on nests with eggs in mid- to late-May. Adults with young birds observed in early June to early July. Females leave breeding grounds before males; tagged females left around June 28 and tagged males left July 28 (see Migration, below).

Diagnostic Characteristics

The large size, long decurved bill, and cinnamon color is diagnostic of this species. Sexes are similar in appearance, but females average slightly larger than males. Plumages are similar throughout the year. Body is a rich buff tinged with cinnamon or pink. Upperparts are streaked with dark brown. Juveniles are similar to adults except the bill is much shorter (Dugger and Dugger 2002).

Habitat

The Long-billed Curlew breeds in mixedgrass prairie habitats and moist meadows throughout Montana. It prefers to nest in open, short-statured grasslands and avoids areas with trees, dense shrubs, or tall, dense grasses (Dugger and Dugger 2002).

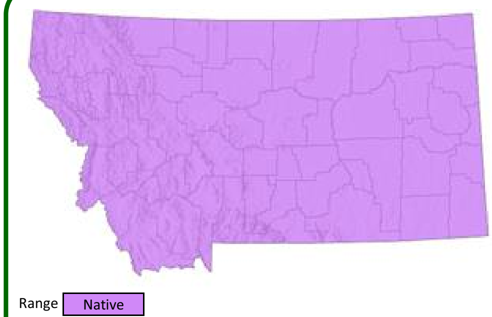
North American Porcupine

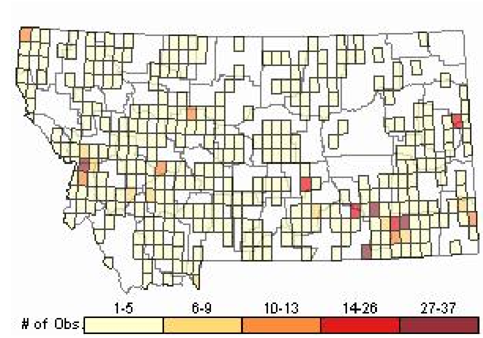
Erethizon dorsatum

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S4

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGIN





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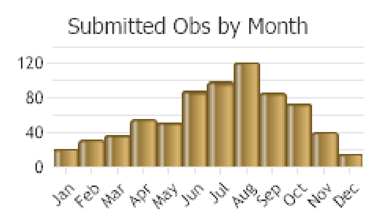


General Description

North American Porcupine adults in the Northwest average 30 inches long and 20 pounds in weight. Round, short-legged, and slow in movement, they are protected by a coat of quills that covers all but their underside and the insides of their legs. Up to 30,000 of these modified hairs, yellowish white and black- or brown-tipped, mix with coarse guard hairs, and lay over thick, brownish underfur. The hollow quill shafts may be up to 5 inches in length and the guard hairs twice as long. They concentrate on the rump and short tail. The Porcupine sheds this coat yearly. Long, heavy claws enable the Porcupine to climb and curl up in trees. Its excellent hearing and sense of smell make up for poor vision (Foresman 2012). At night the Porcupine's bright eyes appear red. Its grunts and high-pitched cries can be heard from a distance (Burt and Grossenheider 1964). Newborns are born with teeth, eyes open, and soft quills that harden within an hour. They can climb the same day.

Habitat

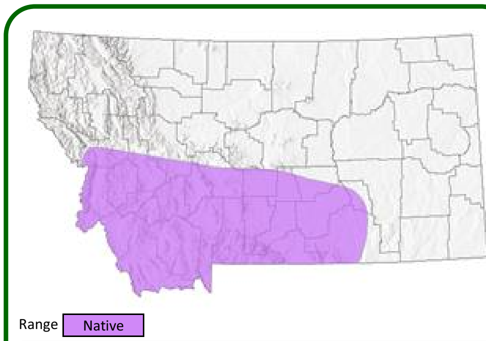
Common in montane forests of western Montana, also occurs in brushy badlands, sagebrush semi-desert and along streams and rivers (Hoffmann and Pattie 1968). Rockfall caves, ledge caves, hollow trees, or brushpiles for dens (Dodge 1982).

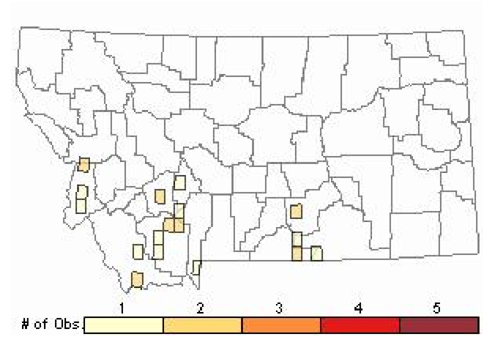
Western Spotted Skunk
Spilogale gracilis

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: SNR

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGIN





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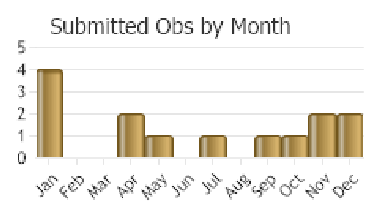


General Description

The Western Spotted Skunk is a small, relatively slender skunk with glossy black fur interrupted with distinct white stripes on the forward part of the body. The posterior part of the body has two interrupted white bands with one white spot on each side of the rump and two more at the base of the tail. The pattern of white lines and spots is individually unique. The top of the tail is black and the underside is extensively white. The tip of the tail is white. A white spot is present on the forehead and another in front of each ear. External measurements in males average 411 millimeters in total length, 122 millimeters for the tail and 50 millimeters for the hind foot. In females, external measurements average 387 millimeters in total length, 116 millimeters for the tail, and 47 millimeters for the hind foot. Males weigh about 630 grams, whereas females weigh about 450 grams (Foresman 2012).

Diagnostic Characteristics

The distinctive black and white pattern of spots and stripes and much smaller size of the Western Spotted Skunk distinguish them from the more common Stripped Skunk (*Mephitis mephitis*), which have two solid white stripes along the side of the body and are nearly twice as large.

The color pattern resembles that of the Eastern Spotted Skunk, but the white markings are more extensive. The black and white stripes on the upper back are nearly equal in width whereas in the Eastern Spotted Skunk the black areas are much more extensive than the white. The tip of the tail is white while the tail tips of Eastern Spotted Skunks are black. In addition to external characteristics, the breeding cycle of the spotted skunks are different (see Reproduction below).

Only Western Spotted Skunks and Striped Skunks are known to occur in Montana, however Eastern Spotted Skunks may also occur in the southeastern part of the state (Foresman 2012).

Habitat

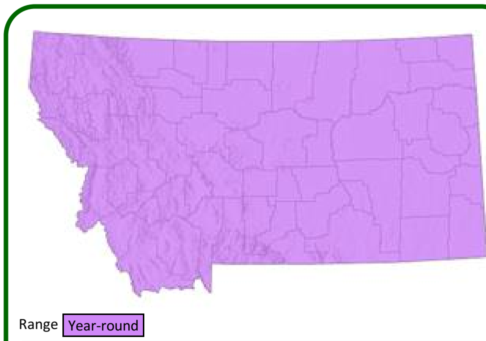
The habitat of the Western Spotted Skunk in Montana is not well known, but they have been found in arid, rocky and brushy canyons and hillsides. Information from other portions of its range suggest that when they are inactive or bearing young they occupy a den in rocks, burrows, hollow logs, brush piles, or under buildings.

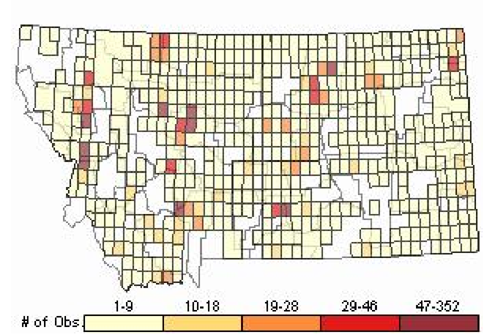
Short-eared Owl
Asio flammeus

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: MBTA; BCC11; BCC17
USFS:
BLM:
PIF: 3





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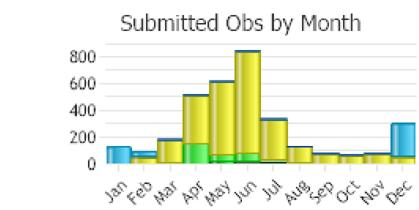


General Description

Short-eared Owls are a small to medium-sized owl. Published lengths range from 37 to 39 centimeters (Cramp 1985) to 34 to 42 centimeters (Mikkola 1983), with females slightly larger than males and considerably heavier, averaging 411 grams compared to 350 grams for males (Mikkola 1983). They are excellent flyers with long wings (95 to 110 centimeters) (Cramp 1985), and light wing-loading (0.333 gram per centimeter squared) (Clark 1975). There is little difference in wing length between the sexes (Clark and Ward 1974). The back and upper wing surfaces are tawny-brown to buff-colored with heavy but indistinct streaking. The ventral surfaces are much lighter, with bold, vertical brown streaking on the breast, and a pair of barely visible ear tufts close together at the top of the facial disk. The belly is pale, lightly streaked; the wings are long and have a buffy patch beyond the wrist above and a dark patch at the base of the primaries below; the dark facial disk contrasts with yellow eyes; and the legs and feet are feathered. Mature males are bright white on the underwing, while mature females show somewhat more buff coloration (Bent 1938, Village 1987). It is, nonetheless, difficult to sex or age these birds in the field. Females are generally darker than males but young birds are also darker than older ones (Mikkola 1983), thus a young male may be darker than an old female. Both sexes have a distinct, black carpal bar and dark wingtips. Juveniles possess full adult plumage by October of the first year (Bent 1938, Cramp 1985). The facial disc is circular and whitish with dark areas around the bright, yellow eyes, black bill. Recently fledged and juvenile Short-eared Owls show much darker coloration overall and a much darker facial disc which whitens with age. The Short-eared Owl gets its common name from the small ear tufts over the eyes. These inconspicuous tufts are part of the facial disc and are generally not seen except when female is in camouflage position on nest or erected when the bird is annoyed or alert. They may possibly aid in making birds more cryptic when in vegetation by breaking the line of the circular facial disc.

The bird is generally silent but does vocalize in courtship (a low, repeated, hooting "*voo, hoo, hoo, hoo*", or in conjunction with defensive behavior or annoyance, yaps or barks). The call is given approximately 15 times during courtship flight and is also accompanied by an audible wing-clap and dive between calls. Young give a food-begging call ("*pssssip*") that apparently aids adults in locating them from the time they leave the nest until after fledging. Adults may squeal while feigning injury during broken-wing acts to distract intruders from nests or young. Both young and adults will clack their bills when annoyed or in defense. Apparently, no data exist on the use of broadcasting tape-recorded vocalizations for detection or monitoring purposes.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Short-eared Owls can be distinguished by large "wrist" patches and moth-like flight. Long-eared Owl (*Asio otis*) has a smaller "wrist" patch, buffy underwings, and a darker belly. Although Long-eared Owls hunt similarly to

Short-eared Owls, they are rarely seen hunting during the day. Short-eared Owls are probably the most diurnal of owls (Lockie 1955, Clark 1975) and may often be observed from late afternoon until nightfall, or at dawn. A crow-sized owl seen abroad during daylight in open country will most likely be a Short-eared Owl. However, they also hunt at night. They are easily recognized by their blunt-headed profile and the fact that they glide with their wings held horizontally. This contrasts with the shallow v-shape of the Northern Harrier (*Circus cyaneus*) with which the Short-eared Owl often shares habitat and may be confused. Northern Harriers may also be distinguished by their white rump patch. Habitat is useful in separating Short-eared Owls from Long-eared Owls, the latter being predominantly a woodland dweller. The Long-eared Owl is also more slender with much longer ear tufts. Burrowing Owl also inhabits open country but is smaller (24 centimeters vs. 38 centimeters), has relatively longer legs, a yellow to whitish bill, and (in adults) has at least some horizontal barring on the breast. The Short-eared Owl's style of flight is unique and has at times been called mechanical, moth-like, or even slovenly (Peterson 1934).

Habitat

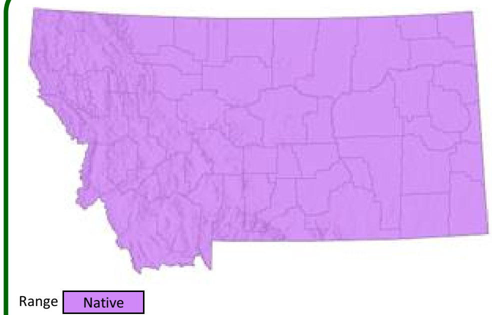
Open grasslands, plains, and agricultural areas with suitable vegetation and food.

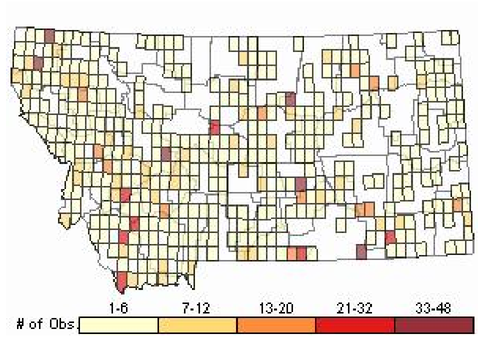
Little Brown Myotis
Myotis lucifugus

View in Field Guide

Species of Concern
Native Species
Global Rank: G3G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGCN3





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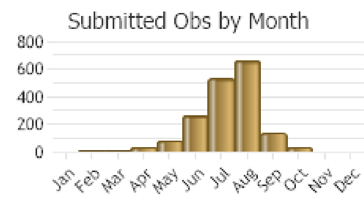


General Description

The most common bat species in Montana (Foresman 2012). Cinnamon-buff to dark brown above, buffy to pale gray below; hairs on back have long glossy tips; ears, when laid forward, reach approximately to the nostril; tragus about half as high as ear; calcar without keel; length of head and body 41 to 54 mm, ear 11.0 to 15.5 mm, forearm 33 to 41 mm; braincase rises gradually from rostrum; greatest length of skull 14 to 16 mm; length of upper toothrow 5.0 to 6.6 mm (Hall 1981).

Diagnostic Characteristics

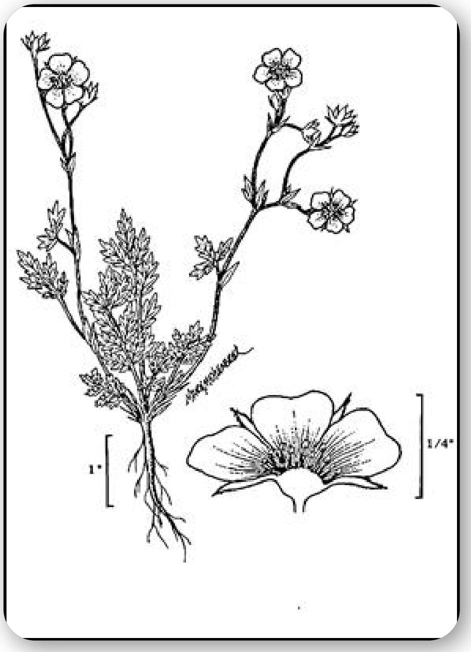
Can be distinguished from all but one of the seven *Myotis* species in Montana by the absence of a fringe of hair around the uropatagium and the absence of a keeled calcar. Can be distinguished from Yuma myotis by the glossy appearance of the dorsal hair and dark brown ear color. (Foresman 2012)

Habitat

Found in a variety of habitats across a large elevation gradient. Commonly forages over water. Summer day roosts include attics, barns, bridges, snags, loose bark, and bat houses. Known maternity roosts in Montana are primarily buildings. Hibernacula include caves and mines.

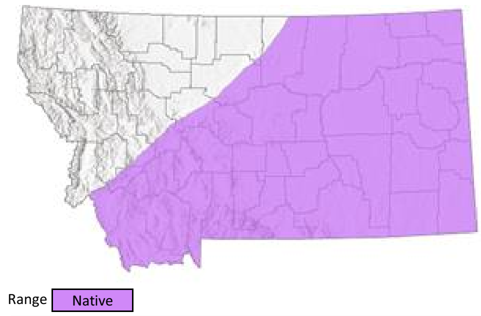
Platte Cinquefoil
Potentilla plattensis

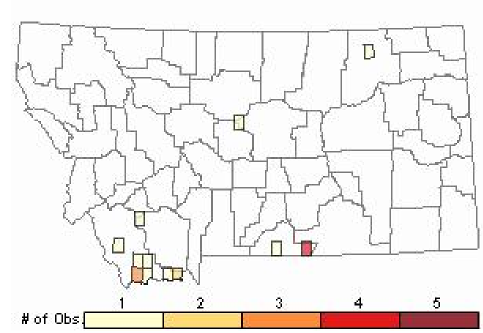
View in Field Guide



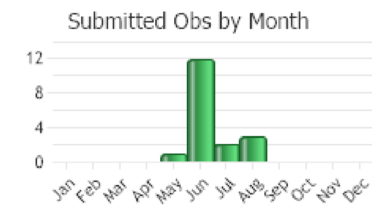
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 4
C-value: 6





 # Observations: 18



General Description

Platte Cinquefoil is a perennial herb with several erect to prostrate stems that are 10-20 cm high and arising from a branched rootcrown and taproot. The numerous, pinnately compound, basal leaves have 7-17 oblong, deeply-lobed leaflets and petioles that are 1-7 cm long. Stem leaves are alternate and become sessile above. Foliage is sparsely covered with long hairs. The stalked flowers are borne in an open, branched inflorescence that is nearly half as high as the plant. The saucer-shaped flowers have 5 broadly lance-shaped sepals that are 3-4 mm long, 5 yellow, oblong petals that are 4-6 mm long, 20 stamens, and numerous ovaries. The nearly smooth, brown achenes are 1-2 mm long, and each has a filiform style arising from near the top.

Phenology

Flowering in June.

Diagnostic Characteristics

There are many similar-appearing species of *Potentilla*. A technical key and hand lens or microscope are required for positive determination. The leaves with 7-17 sparsely hairy leaflets and the achene with a long, slender style borne at its tip help to identify this species.

Habitat

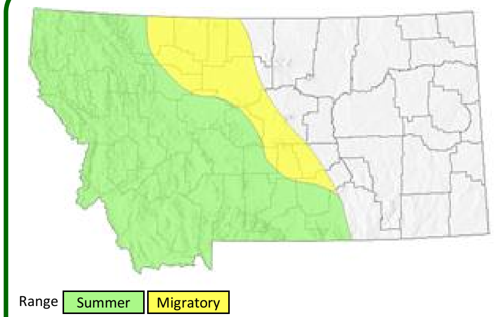
Mesic grasslands and sagebrush steppe in the valley and montane zones.

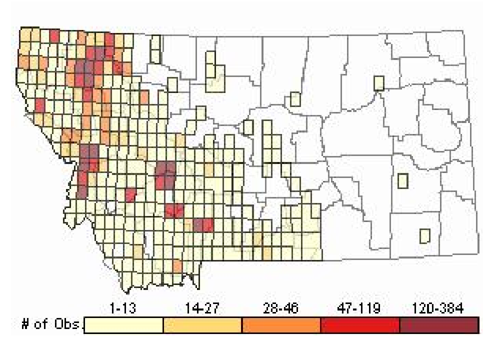
Rufous Hummingbird
Selasphorus rufus

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G4
State Rank: S4B

Agency Status
USFWS: MBTA; BCC10
USFS:
BLM:
PIF: 3





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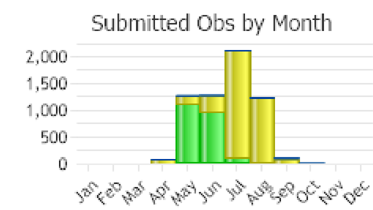


General Description

Widely known for its aggressive nature. Short-bodied, stubby and rusty in appearance. Sexually dimorphic. Male's dorsal plumage is a non-iridescent rusty red. Female and juvenile dorsal plumage is a green iridescence. Male gorget is brilliant orange-scarlet. Female throat varies from clear or streaked with bronze-green, to multiple scarlet spots or large central gorget patch of male-like colors. Male's wings emit a metallic whine. Juveniles resemble females with green iridescent backs and white-tipped rectrices. (Healy and Calder 2006)

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Broad-tailed Hummingbirds are larger with broad, lengthy tails and buff or buff-and-green flanks. Calliope Hummingbirds are smaller, with shorter bills and noticeably shorter tails. Black-chinned Hummingbirds are a dull metallic bronze-green above; males have the black chin and throat that give the species its name.

Habitat

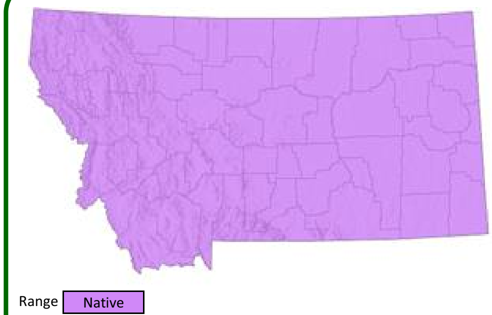
Generally cool environments. Principally secondary succession communities and openings, forested and brushy habitats of the Pacific northwest through the Gulf of Alaska coastal forests and inland to northern Rocky Mountains. Typically nests in second growth and mature forests. (Healy and Calder 2006)

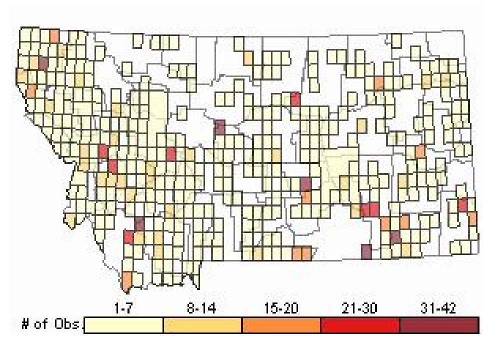
Silver-haired Bat
Lasionycteris noctivagans

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G3G4
State Rank: S4

Agency Status
USFWS:
USFS:
BLM:





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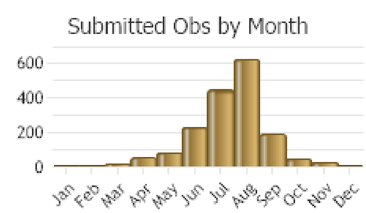


General Description

A mostly black bat with back hairs having silvery-white tips. Flight membranes are black. The tail membrane has fur on the dorsal side to the tip of the tail. Ears are bare, short, and rounded with a lighter patch at the front base of the ear.

Habitat

Occupy mature conifer and deciduous forests, riparian woodlands and aspen. Summer day roosts include tree cavities, under loose bark, also bird nests, sheds, and barns. Hibernacula include tree cavities, rock crevices, and buildings.

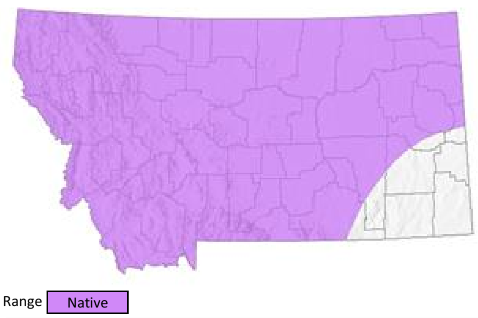
Preble's Shrew
Sorex preblei

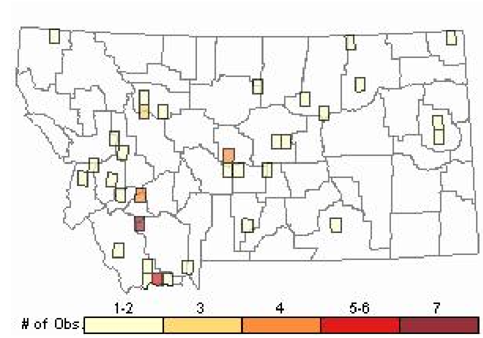
View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGCN3

No photos are currently available





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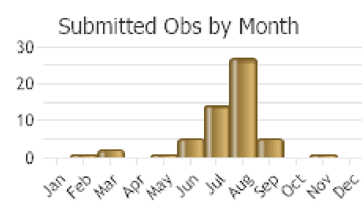


General Description

Like other members of the genus *Sorex*, the snout is long and pointed, and the eyes are small. The dorsal pelage is dark brown to dark gray, and the ventral pelage is silvery-gray. The tail is bicolored, olive-brown above and hazel-brown below. The skull has 32 teeth (dental formula: I 3/1, C 1/1, P 3/1, M 3/3); the 5 upper teeth with single cusps that are present posterior to the first incisor are termed the unicuspids (U), and include 2 incisors, 1 canine, and 2 premolars. The tine on the medial edge of the first incisor is long, acutely pointed, and set within the pigmented area; U3 is as large or larger than U4. Ranges of external measurements (in millimeters) are: total length 77 to 95, tail length 28 to 38, hind foot length 7 to 11, ear length 8 to 11, weight 2.1 to 4.1 grams (Cornely et al. 1992, Verts and Carraway 1998). Published cranial measurements (in millimeters) are: condylobasal length 13.8 to 15.1, palatal length 5.4 to 5.8, cranial breadth 7.0 to 7.2, interorbital breadth 2.9 to 3.1, maxillary breadth 3.8 to 4.2, dentary length 5.6 to 6.7, length of mandibular tooth row (C1-M3) 3.8 to 4.2.

Some Montana specimens (n = 14) exceed some reported values: condylobasal length 13.5 to 14.6, palatal length 5.4 to 6.2, cranial breadth 7.0 to 7.5, interorbital breadth 2.4 to 2.6, maxillary breadth 4.0 to 4.2, dentary length 5.9 to 6.3, length of mandibular tooth row (C1-M3) 4.0 to 4.2 (Hoffmann et al. 1969, Hendricks and Roedel 2002).

Diagnostic Characteristics

Preble's Shrew is small, even for a shrew. Other than its small body size, Preble's Shrew is diagnosed by cranial characteristics. A combination of a medial tine on I1 that is present within the zone of pigmentation, U3 as large or larger than U4, condylobasal length usually less than 15.1 millimeters, palatal length less than 5.8 millimeters, length of dentary less than 6.5 millimeters, length of mandibular tooth row (C1-M3) usually less than 4.1 millimeters, and height of coronoid process less than 3.3 millimeters (Junge and Hoffmann 1981, Carraway 1995).

Habitat

Most Preble's Shrews in Montana have been captured in sagebrush-grassland habitats (Hoffmann et al. 1969, Foresman 2012, Hendricks and Roedel 2002), sometimes in openings surrounded by subalpine coniferous forest. They have been taken in Beaverhead County in stabilized sandhills habitat of about 40 to 60% vegetation cover, dominated by grasses (*Stipa comata*, *Festuca idahoensis*, *Agropyron dasystachyum*) and shrubs (*Artemisia tridentata*, *A. tripartita*, *Chrysothamnus nauseosus*, *C. viscidiflorus*, and *Tetradymia canescens*), with isolated dense patches of *Opuntia fragilis* present (Hendricks and Roedel 2002). Preble's Shrew was also present at two other grazed sites (in Beaverhead and Powell counties) dominated by medium-stature (0.5 to 1.5 meters tall) sagebrush; at both sites, sagebrush cover was about 25% (Paul Hendricks, unpublished data).

Throughout its range, the Preble's Shrew occupies a variety of habitats, including arid and semiarid shrub-grass associations, openings in montane coniferous forests dominated by sagebrush, willow-fringed creeks and marshes, bunchgrass associations, sagebrush-aspen associations, sagebrush-grassland, oak chaparral, open ponderosa pine-Gambel oak stands, and alkaline shrubland (Williams 1984, Ports and George 1990, Cornely et al. 1992, Long and Hoffmann 1992, Kirkland and Findley 1996, Verts and Carraway 1998).

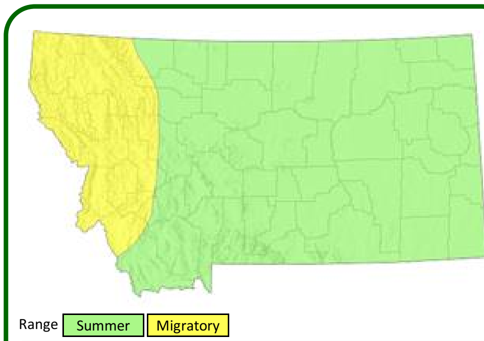
The bulk of Preble's Shrews captured have come from arid habitats, often in the immediate or nearby presence of sagebrush. In southwestern Wyoming, individuals were captured in sagebrush-steppe: islands of *Artemisia* *tridentata*, *Purshia tridentata*, and *Amelanchier utahensis* more than 30 centimeters tall surrounded by large expanses of *Artemisia* less than 30 centimeters tall (Kirkland et al. 1997). In southern British Columbia, Preble's Shrews were captured in lightly to moderately grazed grassland patches surrounded by scattered stands of Douglas-fir (*Pseudotsuga menziesii*) or ponderosa pine. Big sagebrush, common snowberry (*Symphoricarpos albus*), or antelope bitterbush (*Purshia tridentata*) about 1 to 2 meters in height formed dense shrub cover of 30 to 80% (Nagorsen et al. 2001); cheatgrass (*Bromus tectorum*) was sometimes dominant, and the nearest standing water to trap sites was 350 to 2300 meters distant.

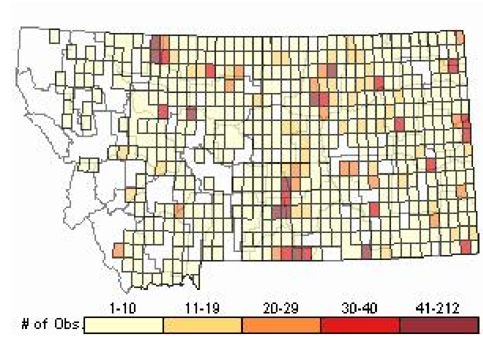
Loggerhead Shrike
Lanius ludovicianus

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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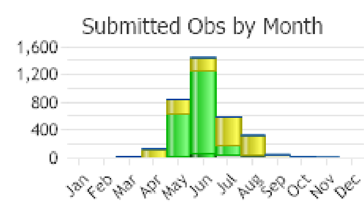


General Description

Slightly smaller than the American Robin (*Turdus migratorius*), the total length of this bird averages 23 cm. Males and females are similar in appearance. This species has a stout, hooked bill that has dark upper and lower mandibles. It has a broad black mask extending above the eye and thinly across top of bill. Its head and back are covered with a bluish-gray cowl, while its underparts and rump are white or grayish-white (underparts are very faintly barred in adults). It has a black tail with white tip and large white patches on black wings. Juveniles are paler and barred overall, with brownish-gray upperparts and buffy wing patches (Miller 1931, Fraser and Luukkonen 1986). Most nests are made of coarse twigs with a lining of plant material and animal hair (Fraser and Luukkonen 1986).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

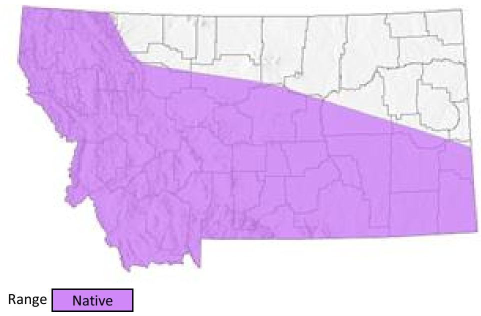
Loggerhead Shrikes differ from Northern Shrikes (*Lanius excubitor*) by having the base of the lower mandible black instead of pale, unbarred or barely barred underparts (adults), a shorter and less hooked bill, a darker head and back, and a more extensive black mask. They differ from the Northern Mockingbird (*Mimus polyglottos*) by having a black mask and a shorter, less curved bill.

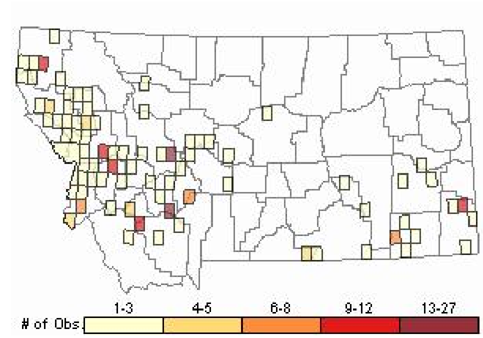
Habitat

Open landscapes with short vegetation, including pastures with fence rows, mowed roadsides, agricultural fields, riparian areas, and open woodlands (Yosef 1996). In Idaho, nests are found in sagebrush (65%), bitterbush, and greasewood, and are equally successful in all three (Woods and Cade 1996).

Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3





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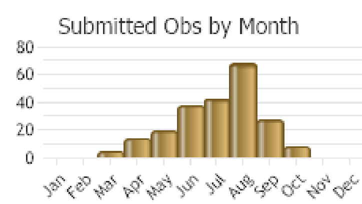


General Description

The Fringed Myotis is a member of the long-eared myotis group. Although similar to Western Long-eared Myotis (*Myotis evotis*), it is the only species with a well-developed fringe of hairs on the posterior margin of the uropatagium, and is larger than most other *Myotis*, except in ear size. The robust calcar is not distinctly keeled. The skull is relatively large, with a well-developed sagittal crest, and 38 teeth (dental formula: I 2/3, C 1/1, P 3/3, M 3/3). Color of the pelage varies from yellowish-brown to darker olivaceous tones; color tends to be darker in northern populations. The ears and membranes are blackish-brown and tend to contrast with the pelage. Length of the head and body is 43 to 59 millimeters, length of the tail is 34 to 45 millimeters, length of the ear is 16 to 20 millimeters, length of the forearm is 40 to 47 millimeters, and weight is 5.4 to 10.0 grams. Females are significantly larger in head, body and forearm size (O'Farrell and Studier 1980, Nagorsen and Brigham 1993, Foresman 2012).

Diagnostic Characteristics

The presence of a well-developed fringe of hairs along the posterior edge of the uropatagium is unique among the *Myotis* found in Montana, including the other long-eared species. The forearm is longer (usually more than 40 millimeters) than all other species of *Myotis* except some individuals of *M. evotis* (a long-eared species) and *M. volans* (a short-eared species with a keeled calcar). The skull is broader than other *Myotis* species, with a distance across the upper molars more than 6.2 millimeters.

Habitat

The few Montana records indicate that the habitats in Montana that are used by the Fringed Myotis are similar to other regions in the interior West (Foresman 2012). It has been captured in ponderosa pine and Douglas-fir forest while foraging over willow/cottonwood areas along creeks and over pools, and taken in caves (Lewis and Clark Caverns); one individual was captured in an urban setting in Missoula (Hoffmann et al. 1969, Butts 1993, Dubois 1999).

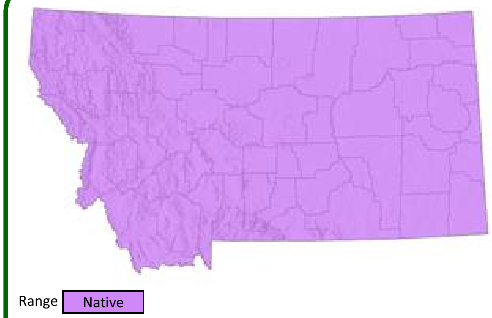
Habitat information gathered from range-wide studies state the Fringed Myotis is found primarily in desert shrublands, sagebrush-grassland, and woodland habitats (ponderosa pine forest, oak and pine habitats, Douglas-fir), although it has been recorded in spruce-fir habitat in New Mexico. It also occurs at low elevations along the Pacific Coast, and in badlands in the northern Great Plains (Jones et al. 1983, Humes et al. 1999). It roosts in caves, mines, rock crevices, buildings, and other protected sites. Nursery colonies occur in caves, mines, and sometimes buildings (Easterla 1973, O'Farrell and Studier 1980, Jones et al. 1983). Fringed Myotis in riparian areas tend to be more active over intermittent streams with wider channels (5.5 to 10.5 meters) than ones with channels less than 2.0 meters wide (Seidman and Zabel 2001).

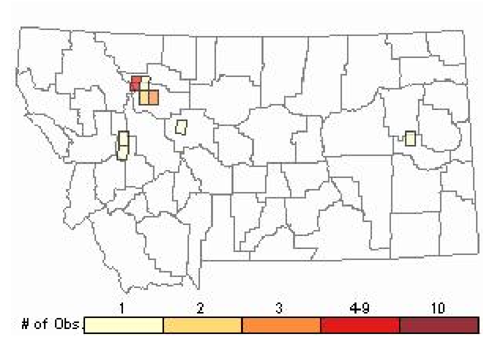
Crawe's Sedge
Carex crawei

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 6





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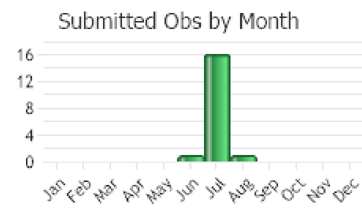


General Description

Rhizomatous. Stems erect, 5–20 cm. Leaves basal and cauline; blades 1–4 mm wide. Inflorescence of 2 to 5 well-separated spikes; the lowest bract shorter than the inflorescence. Spikes ascending; the uppermost male, 1–2 cm long; the lower female, 8–20 mm long, pedunculate, sometimes arising from the base. Perigynia spreading to ascending, green to tan, glabrous, ovoid, 2.5–3.5 mm long with an obscure beak; stigmas 3. Female scales ovate, tan with pale margins and a green midvein, shorter and narrower then the perigynia. Achene 3-sided, partly filling the perigynium (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Phenology

The fruit matures in July.

Diagnostic Characteristics

Carex is a large genus in Montana; the following collection of characters separate Crawe's sedge from others in the state. Crawe's sedge has 3-sided achenes and a slender, terminal male spike less than 20 mm long. It has erect, rather than spreading or drooping, female spikes, and the glabrous, yellow-green perigynia do not have distinct beaks. Of the similar species, *Carex livida* has whitish perigynia and always grows in peat, and both *Carex lanuginosa* and *C. lasiocarpa* have hairy perigynia.

Habitat

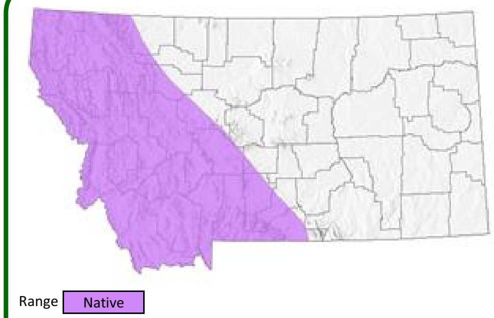
Crawe's sedge grows in wet, gravelly or sandy soil along streams or pond margins, often where there is some natural wave or flow disturbance. It occurs in the valleys and montane foothills, especially where the dominant parent material is calcareous. Common associates include *Carex oederi*, *C. lanuginosa*, *C. aurea*, *Juncus balticus*, and *Potentilla fruticosa.*

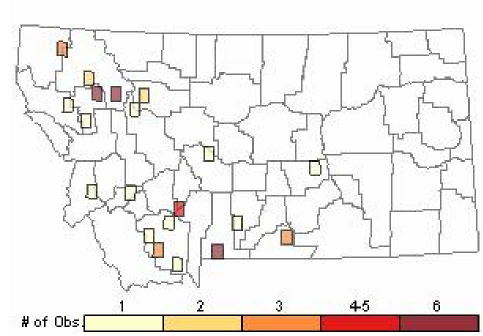
Beaked Spikerush
Eleocharis rostellata

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 2
C-value: 9





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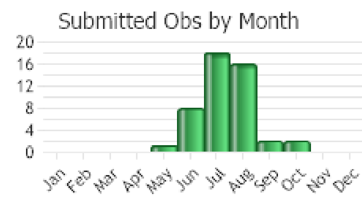


General Description

PLANTS: Cespitose, perennial herbs with erect or arching stems reaching 10 to 80 cm tall. Plants have short shallow rhizomes and may also root at the stem tip by means of an apical bulbil. Source: Lesica et al. 2012.

LEAVES: Leaves are bladeless and reduced to 2 sheaths on the lower stem. The sheath of the distal leaf is firm and persistent. Leaf tip obtuse to subacute without a tooth-like projection. Source: Lesica et al. 2012.

INFLORESCENCE: A 4 to 15 mm long single spikelet with few to many flowers. Florets are tightly packed and spirally arranged. Source: Lesica et al. 2012.

The specific epithet *rostellata* originates from the Latin adjective *rostellatus* meaning “equipped with a beak” or “beaklike” (Arsenijevic et al. 1995). *Eleocharis* is made up of the two Greek words *hele*- and -*charis* meaning “marsh” and “grace” respectively (Merriam-Webster).

Phenology

Beaked Spikerush flowers in July; mature fruits develop from July to August (Smith *in* Flora of North America (FNA) 2002).

Diagnostic Characteristics

Montana has eight *Eleocharis* species. They are generally mat-forming wetland herbs with inflorescences consisting of a single, solitary spikelet (Lesica et al. 2012).

Beaked Spikerush - *Eleocharis rostellata*, SOC
*Habit: A low-growing, tufted (cespitose) perennial. Stems are erect or arching and rooting at the tips.
*Stems: More or less flat, some arching to the ground and rooting at the tips. Plants are 10-80 cm tall.
*Spikelets: 4-10 mm long with few to many flowers.
*Achenes: Grayish-green, about 2 mm long. The upper portion of the achene is conical and confluent with the lower portion that is 3-sided to nearly round in cross section.
*Stigmas: 3

Creeping Spikerush - *Eleocharis palustris*,
*Habit: An erect, rhizomatous perennial.
*Stems: More or less cylindrical stems that are 7-90 cm tall with purple bases.
*Spikelets: 5-25 mm long with numerous flowers.
*Achenes: A yellow to brown, smooth, obovate achene that is 2-3 mm long. The upper portion of the achene is pyramidal in shape and appearing separated from the lower portion which is orbicular to lenticular in shape.
*Stigmas: 2

Few-flower Spikerush - *Eleocharis quinqueflora*,
*Habit: An erect, short-rhizomatous perennial.
*Stems: 5-25 cm tall and tufted.
*Spikelets: 4-8 mm long and usually with 5 flowers.
*Achenes: Brown, smooth, narrowly obovate, and 2-3 mm long. The upper portion of the achene forms a distinct beak that is confluent with the lower portion that is 3-sided.
*Stigmas: 3

Habitat

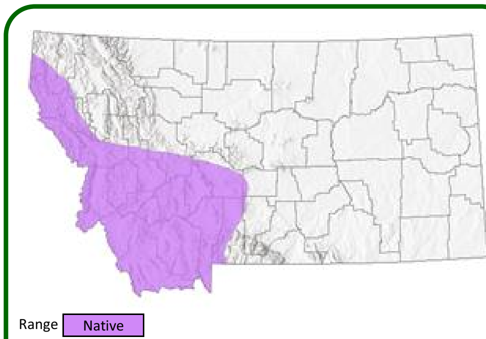
Eleocharis rostellata prefers wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones of Montana (Lesica et al. 2012). It may also occur in various other types of alkaline wetlands including salt and brackish marshes, tidal flats, alkaline seeps, bogs, stream margins, hot spring edges, and swamps (Carey 1994).

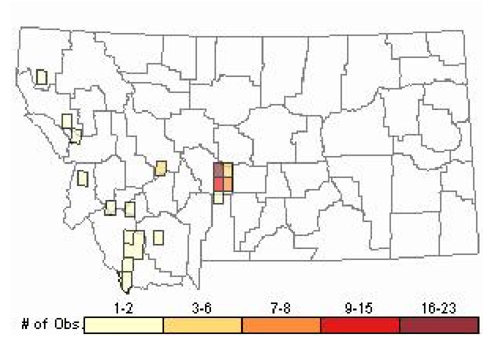
Linear-leaf Fleabane
Erigeron linearis

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 2
C-value:





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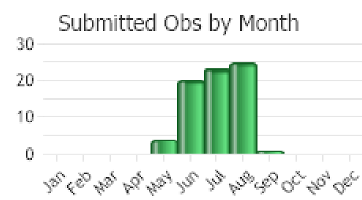


General Description

Linearleaf Fleabane has unbranched stems that are 5-30 cm tall and which arise from a stout taproot and branched rootcrown. The mostly basal leaves are linear and 1-9 cm long. The bases of the stems and leaves are enlarged and straw-colored or purplish, and the herbage is covered with fine gray hairs. The flower heads are usually solitary at the ends of the stems. The involucral bracts are 4-7 mm long and are covered with long, appressed hairs and occasionally also with glands. The 15-45 yellow rays are 4-11 mm long and the yellow disk flowers are 3-5 mm long. There are 10-20 pappus bristles at the top of each achene.

Phenology

Flowering occurs from May to early June.

Diagnostic Characteristics

Linear-leaf fleabane is our only *Erigeron* with yellow ray flowers. *Erigeron filifolius* and *E. ochroleucus* also have narrowly linear leaves but the ray flowers are white or blue and and *E. filifolius* has more than one head per stem. Members of the genus *Stenotus* (formerly a part of *Haplopappus*) have yellow rays, but the involucral bracts are in 2-3 series of different height.

Habitat

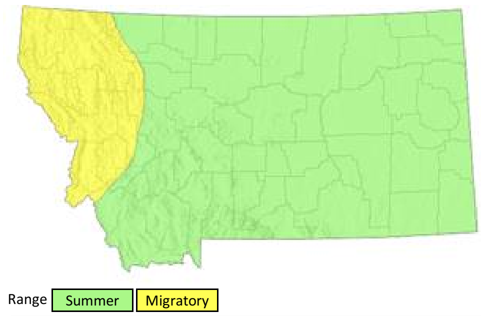
Erigeron linearis occurs in dry, often rocky soil from the foothills up to moderate elevations, frequently with sagebrush (Heidel and Cooper 1998). Dominant species in its habitat include bluebunch wheatgrass and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Associated species and habitats vary widely. In the Scratchgravel Hills near Helena, it occupies two distinct habitats - one a midslope opening on a steep east-facing timbered hillside, and the other a gently southwest-facing lower slope in open rolling plains. In Beaverhead County, linear-leaf fleabane was found on granular, diabase-derived soil in rolling sagebrush steppe, where it occupied a disturbed opening dominated by *Agropyron smithii*, along with other species characteristic of disturbed areas, including *Arenaria kingii, Bromus tectorum, Chrysopsis villosa, Haplopappus acaulis, Oxytropis sericea* and *Phlox bryoides*. Other small populations in Beaverhead and Silver Bow counties were found in sparse vegetation.

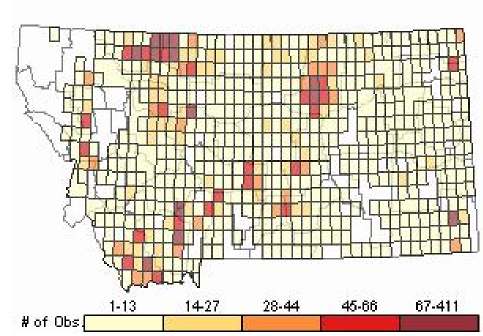
Ferruginous Hawk
Buteo regalis

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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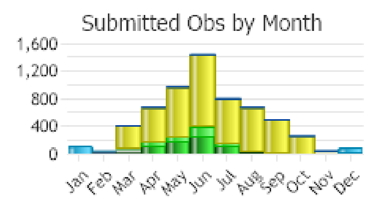


General Description

Ferruginous Hawks have rusty backs and shoulders, pale heads, and white tails washed with pale rust. They have a white patch at the base of the flight feathers on the upper wing surface. Their wings are brown above and white below. The rusty legs of the adult form a dark V contrasted with whitish underparts. Ferruginous Hawks usually appear very light-colored when viewed from a distance. The uncommon dark phase lacks dark tail bands and are dark brown on the body, but still have the whitish tail. The species averages 58 cm long with a 135 cm wingspan. Immature birds are brown instead of rust, and have brown streaking on the undersides.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Krider's Red-tailed Hawk (*B. jamaicensis*) is brown, not rust, has white feathers on the legs, dark shoulder patches, and a dark band across the belly. The dark phase Ferruginous Hawk differs from the dark phase Rough-legged Hawk (*B. lagopus*) by the absence of dark tail bands in the former. Immature Ferruginous Hawks resemble the Great Plains form of the Red-tailed Hawk, but have larger white wing patches and lack the dark bar on the leading edge of the underwing.

Habitat

The habitat of Ferruginous Hawks in Montana has been studied extensively (Ensign 1983, Restani 1989, 1991, De Velice 1990, Wittenhagen 1992, Black 1992, Atkinson 1992, 1993) and described as mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe. In southeastern Montana, Ensign (1983) reported mixed-grass prairie with black greasewood (*Sarcobatus vermiculatus*) and big sagebrush (*Artemisia tridentata*) in uplands and drainages. Other shrub and tree species present in the habitat were junipers (*Juniperus* ssp.), cottonwoods (*Populus* ssp), willows (*Salix* spp.), and ponderosa pine (*Pinus ponderosa*). Also in southeastern Montana, Wittenhagen (1992) reported Ferruginous Hawk habitat to consist of shrub-grasslands with big sagebrush present as well as wheatgrasses. The Kevin Rim area of north-central Montana has been categorized as grasslands dominated by bluebunch and western wheatgrass, blue gramma, and other grasses (De Velice 1990). Habitat also exists for Ferruginous Hawks in the Centennial Valley in the southwestern portion of the state. Restani (1989, 1991) reported grass-sagebrush complexes on mid-elevation slopes to be where most hawks nested. These complexes included sagebrush species and rabbitbrush as overstory to wheatgrasses, needle-and-thread grass, and junegrass. Also in southwestern Montana, Atkinson (1992, 1993) described the preferred habitat as sagebrush steppe over foothill prairie or mountain mahogany.

Black (1992) surveyed Ferruginous Hawk habitat in Phillips County and reported the habitat to be 69% grassland, 25% shrubland and 13% bare area.

Nest location studies have also described the habitat Ferruginous Hawks use during the breeding season. In southwestern Montana, sagebrush (*Artemisia*) and grasslands predominated within 100 meters of nests (Atkinson 1992). Ground nests in northern Montana were located in grass-dominated, rolling (more than 10 percent slope) rangeland. In cultivated areas (20 percent) in north-central Montana, nests closer to cultivated fields and roads were more successful, presumably because of higher prey densities associated with edge habitats (Zelenak et al. 1997). Nests in southwestern Montana were significantly oriented toward the south (Atkinson 1992). Nests on rock outcrops in Montana were built on slopes averaging 62.8 percent and were found on the upper 35 percent of the slope (Atkinson 1992). Ground nests in northern Montana were located either on the top of a small rise or on slopes ranging from 10 to 50 percent (Black 1992). The average height of ground nests below the highest surrounding topographic feature was 10 meters, whereas the average height of ground nest sites above the valley floor was 10.4 meters, indicating that nests were placed at mid-elevation sites within the immediate topography (Black 1992).

Ferruginous Hawks do not appear to nest in areas converted to agriculture (Schmutz 1984, Jasikoff 1982). A study done in Petroleum and Fergus counties seems to support this statement. Rogers and Rogers (1995) reported direct observations of Ferruginous Hawks avoiding crested wheatgrass (*Agropyron cristatum*) fields as nesting locations. They concluded few prey resources in such monotypic croplands as the reason for not nesting in these habitats.

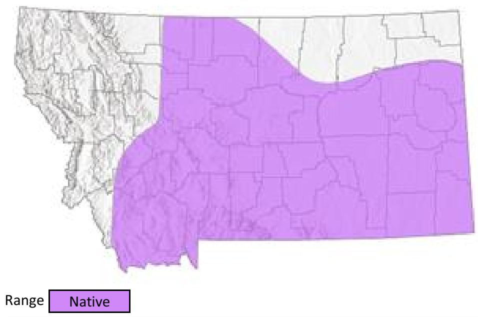
Dwarf Shrew
Sorex nanus

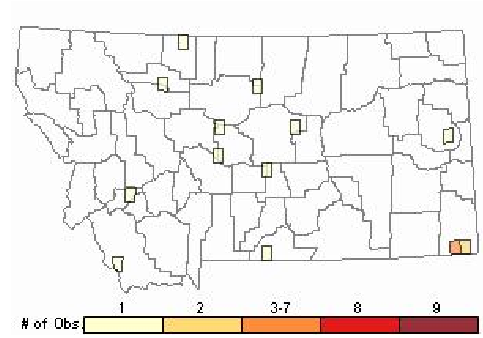
View in Field Guide

No photos are currently available

Species of Concern
Native Species
Global Rank: G4
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGCN2-3





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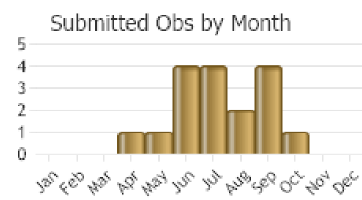


General Description

The Dwarf Shrew is a small, grayish-brown shrew. Summer pelage is brown above, gray and somewhat buffy below; the tail is indistinctly bicolored to the tip, dark above and buff below; the winter pelage is paler and grayer, especially dorsally. Ranges in external measurements (in millimeters) are: total length 82 to 105, tail length 27 to 45, mass 1.8 to 3.2 grams. Condylobasal length of the skull is less than 15.2 millimeters. The skull has 32 teeth (dental formula: I 3/1, C 1/1, P 3/1, M 3/3); the 5 upper teeth with single cusps that are posterior to the first incisor are termed the unicuspids (U), and include 2 incisors, 1 canine, and 2 premolars. There is a medial tine on I1, and U3 and U5 are smaller than U4 (Hoffmann and Owen 1980, Junge and Hoffmann 1981).

Diagnostic Characteristics

The Dwarf Shrew differs from other shrews in Montana through a combination of the following: small body size, medial tine on I1, U3 smaller than U4, and condylobasal length less than 15.2 millimeters (Junge and Hoffmann 1981). This species differs from *S. tenellus* in averaging slightly smaller and having slightly darker pelage (Hoffmann and Owen 1980). On each half of the lower jaw (dentary), the height of the coronoid process is usually less than 3.1 millimeters, the angle of insertion of I1 is more than 8 degrees from the horizontal ramus of the dentary, and the length of the dentary is usually less than 6.5 millimeters (Carraway 1995).

Habitat

In general, the Dwarf Shrew is found in a variety of habitats, including rocky areas and meadows in alpine tundra and subalpine coniferous forest (spruce-fir), rocky slopes and meadows in lower-elevation forest (e.g., ponderosa pine, aspen, Douglas-fir) with a mixed shrub component, sedge marsh, subalpine meadow, arid sagebrush slopes, arid shortgrass prairie, dry stubble fields, and pinyon-juniper woodland (Hoffmann and Owen 1980, Berna 1990, Kirkland et al. 1997, Rickart and Heaney 2001, Hafner and Stahlecker 2002).

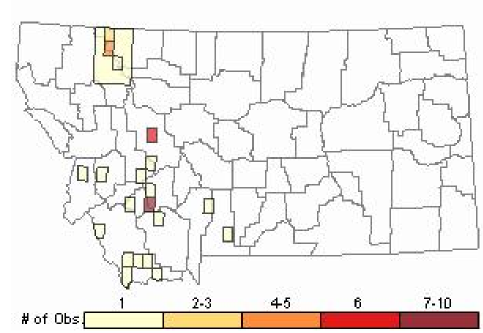
Habitats where Dwarf Shrews have been documented in Montana are similar in variety to those occupied elsewhere in the global range. Many have been taken in rocky locations in alpine terrain and subalpine talus (2 to 10 centimeters diameter) bordered by spruce-fir, lodgepole pine, or Douglas-fir and aspen; lesser numbers have been captured in montane grassland, sagebrush-grassland with 22% bare ground, and prairie riparian habitat dominated by green ash, rose, and timothy (Hoffmann and Taber 1960, Pattie and Verbeek 1967, Hoffmann et al. 1969, Thompson 1977, MacCracken et al. 1985, Foresman 2012).

Dense-leaf Draba
Draba densifolia

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 2
C-value:



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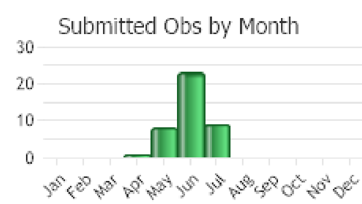


General Description

Dense-leaf Draba is a mat-forming perennial with leaf rosettes at the ends of numerous rootcrown branches, which are clothed with old leaf bases. The leafless stems are 3-15 mm high and arise from some of the rosettes. The fleshy, narrowly lance-shaped leaves are 2-12 mm long and have a prominent midvein and straight, unbranched hairs on the entire margins but are otherwise mostly glabrous. 3-15 stalked flowers are borne at the tops of the stems. Each flower has 4 separate sepals, 4 separate, yellow petals that are 2-6 mm long, and 4 long and 2 short stamens. The style is 0.5-1.0 mm long. The hairy, egg-shaped capsules are 2-7 mm long and are borne on erect or ascending stalks.

Phenology

Flowering from May-July, depending on elevation.

Diagnostic Characteristics

There are many similar-appearing, yellow-flowered, mat-forming species of *Draba* in our area. A technical manual and hand lens or microscope is required for positive identification. This species can be dintinquished from *D. oligosperma* by the simple hairs. *Draba daviesiae* also has glabrous leaves, except for simple hairs on the margins, but it has glabrous fruits.

Habitat

Gravelly, open soil of rocky slopes and exposed ridges in the montane to alpine zones.

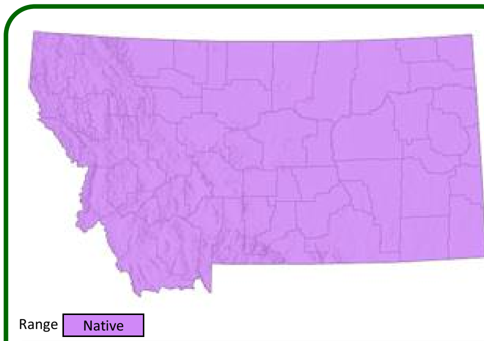
Long-legged Myotis

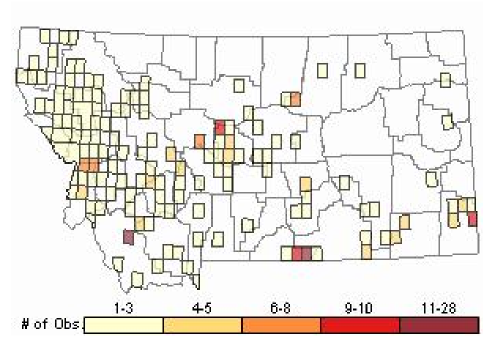
Myotis volans

View in Field Guide

Species of Concern
Native Species
Global Rank: G4G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:





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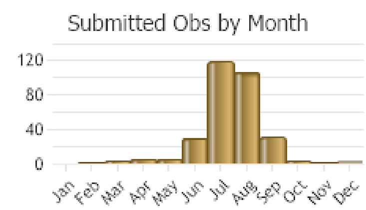


General Description

Similar in appearance to the Little Brown Myotis, but is slightly larger, fur extends from the ventral surface to the elbow on the wing undersurface, and the calcar is keeled. Wingspan is 10-12 inches (25-30 centimeters) and weight ranges from 0.2-0.3 ounces (6-9 grams) (Adams 2003).

Habitat

Occurs mostly in forested mountain regions and river bottoms, also at high elevations. Summer day roosts include trees, rock crevices, fissures in stream banks, abandoned buildings. Hibernacula include caves and mines.

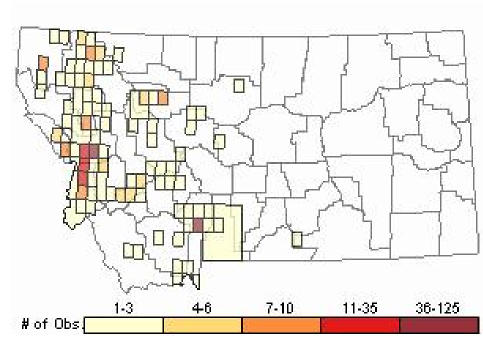
Western Screech-Owl
Megascops kennicottii

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G4G5
State Rank: S3S4

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGIN
PIF: 3

Range Year-round



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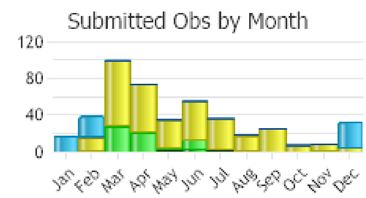


General Description

In Western Screech-Owls, tufts are present, eyes are yellow, the bill is black to gray-green or gray-black. The facial disk is gray and surrounded by a black border. Ventrally, they are a heavily marked owl with dark brown horizontal barring and vertical streaking, creating a uniform dark coloration. Dorsally, they are the same as ventrally, but with distinct white spotting on the shoulders. The size is eight to 10 inches and the weight is six to eight ounces. They have two calls. The first call is, "*toot, toot, toot toot toot toot*" accelerating in tempo, similar to a bouncing ball. The second call is a trill.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Eastern Screech-Owl in Montana has much lighter plumage and has a lighter bill ranging from yellow-white to yellow-green.

Habitat

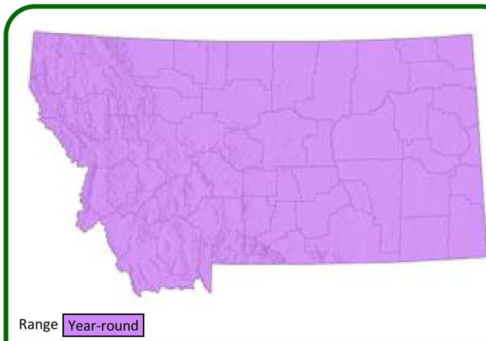
Habitat is primarily cottonwood bottoms, but they may exist along the fringes of coniferous forests where the two habitats overlap.

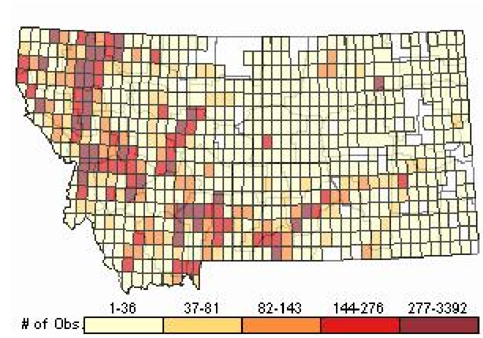
Bald Eagle
Haliaeetus leucocephalus

View in Field Guide

Special Status Species
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: BGEPA; MBTA
USFS: SENSITIVE
BLM: SENSITIVE
PIF: 2





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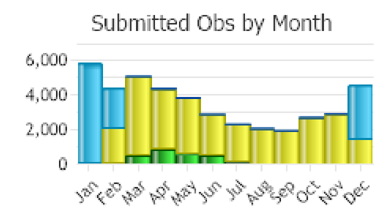


General Description

With a white head and tail contrasting with a dark brown body and wings, the adult plumage of the Bald Eagle, attained at approximately 5 years of age, is unmistakable. In addition to the obvious white head and tail, other distinguishing features include the yellow bill, cere, iris, legs and feet. Second in size of North American birds of prey only to the California Condor (*Gymnogyps californianus*), the Bald Eagle ranges in total length from 71 to 96 cm, with an average wingspan of 168 to 244 cm and a body mass ranging from 3.0 to 6.3 kg (Buehler 2000). In general appearance the sexes are similar with females approximately 25 percent larger than males. The plumage of the juvenile birds is much less distinct, being dark brown overall. The head, body, wings, and tail are dark brown with limited mottling on the underside of the wings and on the belly. While the legs and feet of the young bird are yellow like those of adults, the bill and cere are dark gray and the iris is dark brown.

The voice of the Bald Eagle is a weak series of chirps. The vocalization is described as flat chirping, stuttering whistles, given in a halting fashion, with the immature calls generally harsher and more shrill than those of the adults (Buehler 2000, Sibley 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

In adult plumage, the Bald Eagle is unlikely to be confused with any other species. Juvenile Bald Eagles may be confused with Golden Eagles (*Aquila chrysaetos*), especially with adult Goldens. A few characteristics differentiate these two species. The Bald Eagle has unfeathered legs, while those of the Golden Eagle are feathered. During flight, the head and neck of the Bald Eagle extend to about half the length of the tail, while the Golden Eagle is considerably less. This distinction is true for all age classes of both species. The terminal tail band on the Golden Eagle is dark and well defined, especially on the juveniles. In addition, the underwing and belly of the Bald Eagle show a greater amount of white compared to the Golden Eagle, whose white feathering is restricted to the base of the flight feathers (Buehler 2000).

Habitat

In Montana, as elsewhere, the Bald Eagle is primarily a species of riparian and lacustrine habitats (forested areas along rivers and lakes), especially during the breeding season. Important year-round habitat includes wetlands, major water bodies, spring spawning streams, ungulate winter ranges and open water areas (Bureau of Land Management 1986). Wintering habitat may include upland sites. Nesting sites are generally located within larger forested areas near large lakes and rivers where nests are usually built in the tallest, oldest, large diameter trees. Nesting site selection is dependent upon maximum local food availability and minimum disturbance from human activity (Montana Bald Eagle Working Group 1994). See the Montana Bald Eagle Management Plan (1994) for further details including home range sizes and habitat requirements of fledgling birds.

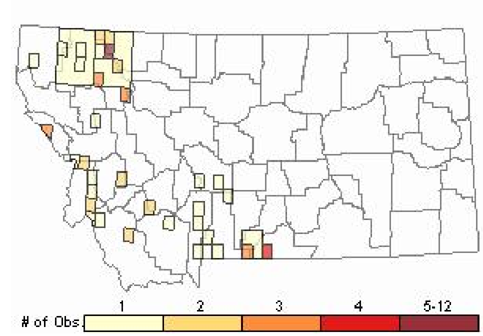
North American Water Vole

Microtus richardsoni

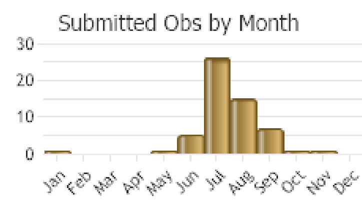
View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 68



General Description

The North American Water Vole, also known as a water rat or Richardson Vole, is the largest vole in Montana. At over 9 inches and around 4 ounces, the male adult is about twice the length and four times the weight of other voles in the state. Long fur covers water voles, dark brown to reddish brown on top, and gray, mixed with white or silver on their bellies. They have long bicolored tails and enlarged flank glands during breeding season (Zeveloff 1988). Foresman (2001) points to the long hind feet and protruding incisors as other characteristics that distinguish these very large, semiaquatic voles.

Habitat

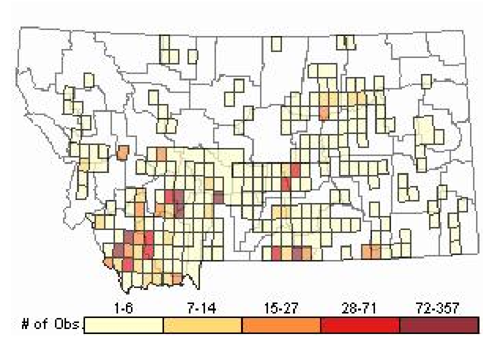
Semi-aquatic. Near streams and lakes in subalpine and alpine zones. Normally above 5000 ft. in western mountains. Moist grass and sedge areas, streamside hummocks overhung with willows (Hoffmann and Pattie 1968, Pattie 1967).

Sage Thrasher
Oreoscoptes montanus

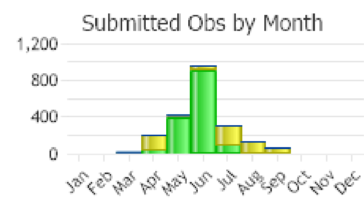
View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 3



 # Observations: 2103



General Description

The Sage Thrasher is North America's smallest thrasher with a relatively short bill and tail. Its long, melodious, mockingbird-like song, originally earned it the name of Mountain Mockingbird (Reynolds et al. 1999). Genetic work indicates this species may, in fact, be more closely related to the mockingbirds (*Mimus*) than to other thrashers (Sibley and Ahlquist 1984). The Sage Thrasher, considered a sagebrush obligate species, is dependent upon large, unfragmented sagebrush habitats for breeding (Reynolds et al. 1999).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

Migrants arrive in Montana in late April through mid-May (Montana Bird Distribution Committee 2012). Records of adults incubating and feeding nestlings have been recorded in early June. Observations of adults feeding fledged young have been recorded from July through August.

Diagnostic Characteristics

The bill and tail of this thrasher are relatively short compared to those of other thrashers. Sexes are similar in plumage characteristics with males slightly larger than females. Adults are brownish-grey with some indistinct dark streaking on the back and crown. A dark streak through the eye separates the upper and lower lighter areas of the face. The cheek is also light with a darker line present along the sides of the throat. The bill is dark and short, and the eyes are yellow to amber in color. Underparts are generally off-white with bold dark marks (Reynolds et al. 1999).

Habitat

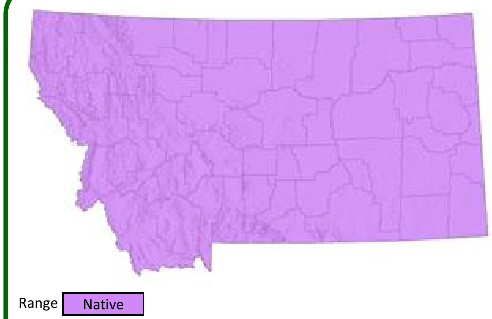
In Montana, the Sage Thrasher breeds in habitats dominated by Big Sagebrush. Sage Thrasher abundance is positively correlated with sagebrush cover and negatively correlated with grass cover. The Sage Thrasher uses sagebrush habitats, grasslands, and other semi-arid habitats during spring and fall migration and tends to avoid areas of human habitation (Reynolds et al. 1999).

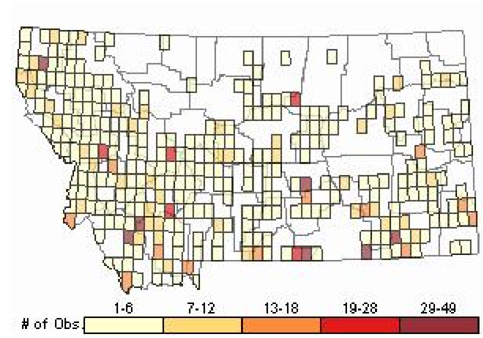
Long-eared Myotis
Myotis evotis

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:





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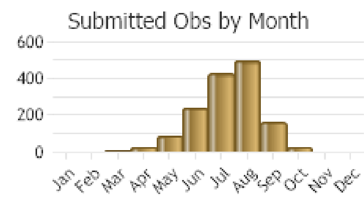


General Description

Ears are black and the longest of any other North American bat in the genus Myotis; > 0.84 inches (>21 millimeters). When bent forward, ears extend > 5 millimeters beyond the tip of the nose. Wingspan of 10-12 inches (25-30 centimeters) and weighs 0.2-0.3 inches (5-8 grams). Coat color is dull brown to straw-colored with individual hairs black at the base (Adams 2003).

Habitat

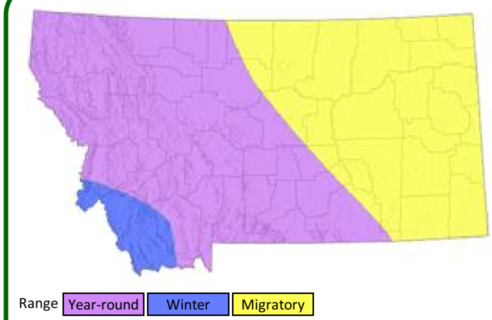
Occupy a wide range of rocky and forested habitats over a broad elevation gradient (Jones et al. 1973). Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, under loose bark, and rock fissures. Hibernacula include caves and abandoned mines. The species has been located hibernating in a mine in riverbreaks habitat in northeastern Montana (Swenson and Shanks 1979).

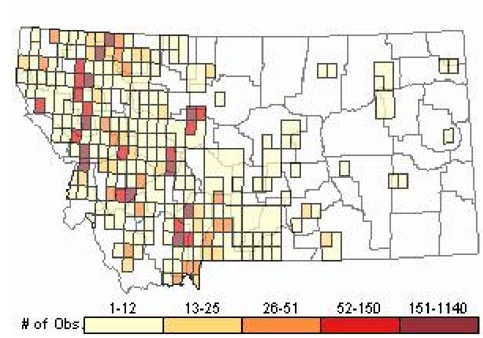
Barrow's Goldeneye
Bucephala islandica

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGIN
PIF: 2





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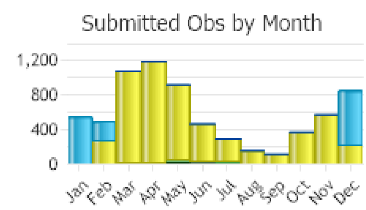


General Description

Medium-sized diving duck. Total length, early-spring mass: male 48.4 cm, 1,278 g; female 43.2 cm, 818 g. Compact, chunky appearance with short neck and round body, with relatively large rounded head and short gray-black bill. Adult sexes are strongly dimorphic in size and plumage most of the year. Breeding male has striking pattern of iridescent, purplish-black head with bright, white crescent-patch between bill and eye; brilliant white sides, breast, belly and secondaries contrasted against black back, wings, and tail. Female has dark chocolate-brown head; slate-gray back, wings, and tail; and white flanks, belly, and breast. Both sexes have bright amber irides (hence the name "goldeneye"). Wing-beat is rapid with relatively deep arc; produces a distinctive "whistle." (Eadie et al. 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

See Tobish (1987) for details on identification of Barrow's and Common Goldeneyes in all plumages.

Habitat

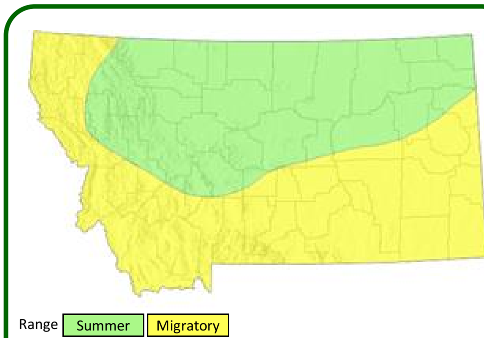
Chiefly a bird of the western montane region of North America. This species is generally restricted to areas west of the Continental Divide. Prefers alkaline to freshwater lakes in parkland areas; to lesser extent, subalpine and alpine lakes, beaver ponds, and small sloughs (Eadie et al. 2000).

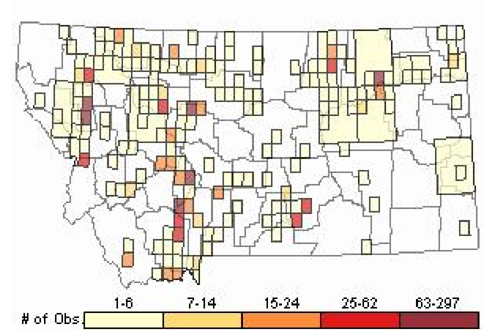
Caspian Tern
Hydroprogne caspia

[View in Field Guide]

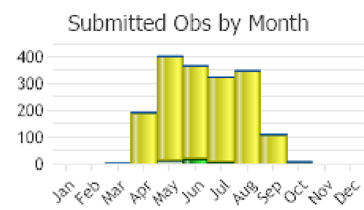
Species of Concern
Native Species
Global Rank: G5
State Rank: S2B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN2
PIF: 2





 # Observations: 1782



General Description

Gull-like in appearance, the Caspian Tern is the largest tern in North America. It has pale gray upperparts, and a white throat, breast, flanks, rump and tail. The all-black cap on the mature adults extends forward to below the eye. Males and females are of like plumage, though the males average slightly larger (Sibley 2000). This species is generally 47 to 54 cm long, with a wingspan of approximately 127 cm. The Caspian Tern has a dark red, stout, rather massive bill, with a dark gray colored tip. The bill on juvenile birds is more orange-red and their upperparts are paler than on the adults.

The vocalization of this species is described as a deep, harsh, heron-like scream "*aaayayaum*" (Sibley 2000). Several other vocalizations are described as the contact, alarm, gakkering, fish (advertising), and female begging calls (Cuthbert and Wires 1999).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Caspian Tern is most similar to the Royal Tern, but the latter species, restricted primarily to the coasts, is rarely observed inland. The Caspian is also a larger bird, by approximately 20 percent, and has broader, blunter wings, and a larger head (Cuthbert and Wires 1999). The Caspian's bill is also much darker and thicker. The legs of a Caspian Tern are also slightly longer and thicker and the tail is not notched as deeply as that of the Royal Tern (Cuthbert and Wires 1999). Caspian Terns are distinguishable from other species of terns by their larger size and the blackish undersurface and whitish uppersurface of the outer primaries (Cuthbert and Wires 1999).

Habitat

In Montana, the Caspian Tern prefers islands within large lakes or reservoirs, where sandy or stony beaches are used for nesting (Johnsgard 1992). The species has also been noted to utilize rivers, though nesting in this habitat is not documented (Johnsgard 1992, Casey 2000).

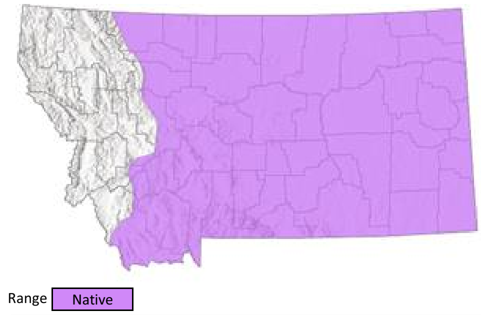
Montana Natural Heritage Program

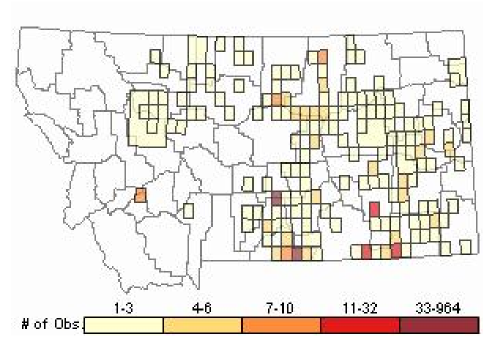
Greater Short-horned Lizard
Phrynosoma hernandesi

View in Field Guide

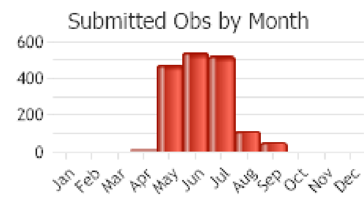
Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3, SGIN





 # Observations: 1764



General Description

The body of the Greater Short-horned Lizard is broad and flattened. The back is spiny, with an especially noticeable single row of scales fringing each side of the body. The spines at the back of the head are about as long as they are wide at the base. The coloration of the back usually blends cryptically with the soil and can vary somewhat from region to region and at single localities. The maximum total length is about 15 centimeters. In males, there is a swelling at the base of the tail, and the tail is proportionally longer than in females. Newborn young have the broad and flattened body shape, and are about 2.0 to 2.5 centimeters snout-vent length and up to 3.8 centimeters by the time of first hibernation.

Diagnostic Characteristics

The broad, flattened body separates this lizard from the other three lizard species regularly documented in Montana, and the range overlaps only with the Common Sagebrush Lizard. The Pygmy Short-horned Lizard has been reported from extreme southwestern Montana, in the Centennial Valley, Beaverhead County (Maxell et al. 2003), but adults of this species are much smaller than Greater Short-horned Lizards, the small horns on the back of the head project almost vertically rather than horizontally, and they lack the wide notch between the horns on the back of the head that gives the head of Greater Short-horned Lizards a "heart-shaped" appearance when viewed from above (St. John 2002).

Habitat

Habitat use in Montana is poorly described, but appears to be similar to other regions. Reports mention individuals on ridge crests between coulees, and in sparse, short grass and sagebrush with sun-baked soil (Mosimann and Rabb 1952, Dood 1980). On the southern exposures of the Pryor Mountains, Carbon County, individuals occur among limestone outcrops in canyon bottoms of sandy soil with an open canopy of limber pine-Utah juniper, and are also present on flats of relatively pebbly or stony soil with sparse grass and sagebrush cover (Paul Hendricks, personal observation).

Canada Lynx
Lynx canadensis

View in Field Guide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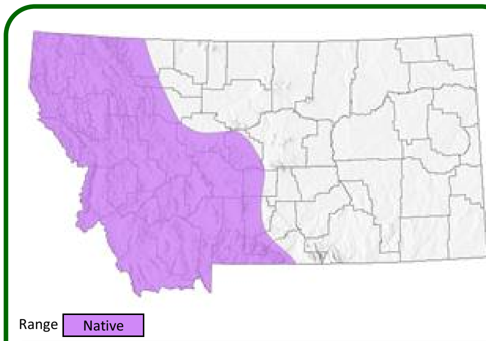
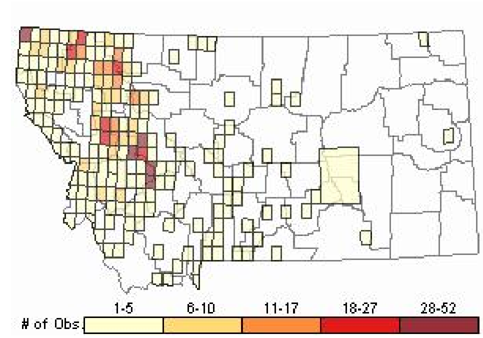
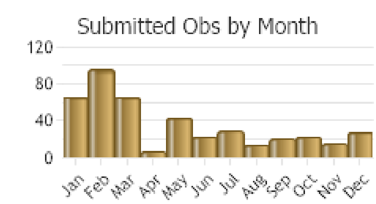
Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: LT; CH
USFS:
BLM: THREATENED
FWP SWAP: SGCN3





 # Observations: 901



General Description

The Canada Lynx is a medium-sized cat (about 10 kilograms for males and 8 kilograms for females) with silver-gray to grayish-brown upperparts and a white belly and throat. Lynx have long legs and a relatively short, compact body. The total length averages approximately 92.5 centimeters for males and 89.5 centimeters for females (Foresman 2012). A facial ruff surrounds the face except directly beneath the snout. The facial ruff is longest on either side of the snout and has black markings on these longest hairs. The ears are 70 to 80 millimeters long and have a long, 30 millimeters black tuft at the end. The backs of the ears are darker than the rest of the body and have a central white spot. The feet are large and round (10 x 10 centimeters) and heavily furred (Foresman 2012). The tail is short and the tip is entirely black.

Diagnostic Characteristics

Canada Lynx are most similar to Bobcats, but differ in many respects. At a distance, Canada Lynx appear leggier and are grayer in color, with less distinctive spotting (Foresman 2012). Canada Lynx have much larger feet and longer ear tufts. In addition, the entire tail tip is black in Canada Lynx whereas in Bobcats the underside of the tail tip is white (Foresman 2012) and the back of the hind legs is black on Bobcats and a light beige color on Canada Lynx. Immature Mountain Lions may be superficially similar to Canada Lynx but have a much longer tail and body.

Habitat

Canada Lynx west of the Continental Divide generally occur in subalpine forests between 1,220 and 2,150 meters in stands composed of pure lodgepole pine but also mixed stands of subalpine fir, lodgepole pine, Douglas-fir, grand fir, western larch and hardwoods (Ruediger et al. 2000). In extreme northwestern Montana, primary vegetation may include cedar-hemlock habitat types (Ruediger et al. 2000). East of the Continental Divide the subalpine forests inhabited by Canada Lynx occur at higher elevations (1,650 to 2,400 meters) and are composed mostly of subalpine fir. Secondary habitat is intermixed Englemann spruce and Douglas-fir habitat types where lodgepole pine is a major seral species (Ruediger et al. 2000). Throughout their range, shrub-steppe habitats may provide important linkage habitat between the primary habitat types described above (Reudiger et al. 2000). Typical snow conditions are important factors for Canada Lynx, with occurrence primarily in habitats that also receive relatively uniform and moderately deep snowfall amounts (total annual snowfall of 100 to 127 centimeters) (Kelsall et al. 1977). Within these habitat types, disturbances that create early successional stages such as fire, insect infestations, and timber harvest, provide foraging habitat for lynx by creating forage and cover for Snowshoe Hares, although older forests also provide habitats for Snowshoe Hares and Canada Lynx for longer periods of time than disturbance-created habitats (Ruediger et al. 2000).

Canada Lynx avoid large openings but often hunt along edges in areas of dense cover (Ruediger et al. 2000). When inactive or birthing, they occupy dens typically in hollow trees, under stumps, or in thick brush. Den sites tend to be in mature or old-growth stands with a high density of logs (Koehler 1990, Koehler and Brittell 1990). These habitats must be near or adjacent to foraging habitat because the hunting range of the female is reduced during this time (Ruediger et al. 2000).

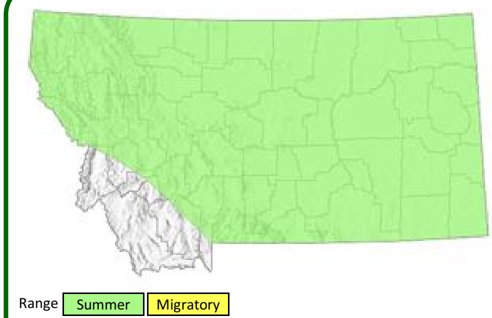
In the South Fork Flathead, Canada Lynx were mostly located in fire-created, densely stocked young stands of lodgepole pine where Snowshoe Hares were most abundant. No locations in open or semi-open areas were observed (Koehler at al. 1979). In the Garnet Range, most were found in subalpine fir forest (Smith 1984). Denning sites are found in mature and old-growth lodgepole pine, spruce, and subalpine fir forests with a high density of logs (Koehler 1990, Koehler and Brittell 1990). Denning stands need not be large (1 to 3 hectares) but several stands should be interconnected (Koehler and Brittell 1990). Canada Lynx require cover for stalking and security, and usually do not cross openings wider than 100 meters (Koehler and Brittell 1990).

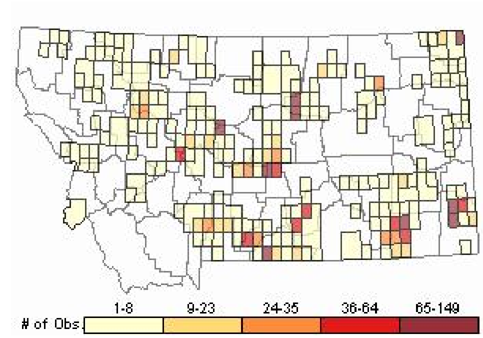
Ovenbird
Seiurus aurocapilla

View in Field Guide

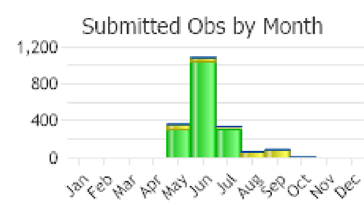
Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4B

Agency Status
USFWS: MBTA
USFS:
BLM:
PIF: 3





 # Observations: 1954



General Description

The Ovenbird is a large, plump-looking warbler, 15 cm long, with a thin pointed bill and pinkish legs; grayish-olive upperparts; and white underparts with blackish-streaked spots on the lower throat, breast, and sides. Sexes are identical. (Porneluzi et al. 2011)

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Most likely to be confused with the Northern Waterthrush, the Ovenbird is distinguished by its bold white eyering, russet crown bordered by dark stripes, absence of a buffy or white eye stripe, rounder shape, and olive (vs. brown) back. (Porneluzi et al. 2011)

Habitat

Relatively mature, large, contiguous tracts of deciduous or mixed coniferous/deciduous forest with closed canopy (Porneluzi et al. 2011).

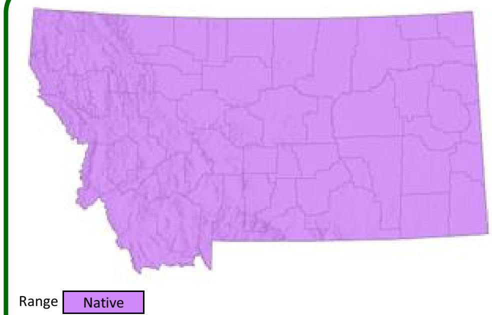
Townsend's Big-eared Bat

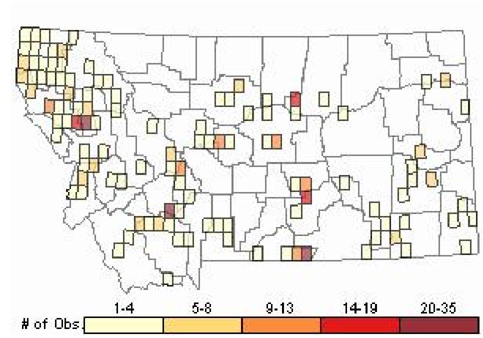
Corynorhinus townsendii

View in Field Guide

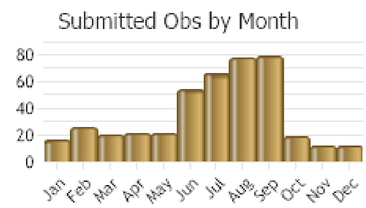
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3





 # Observations: 440



General Description

Townsend's Big-eared Bat is a moderately sized bat found throughout the state where suitable habitat exists, primarily near caves, mines, rock outcrops, and badlands. As the common name suggests, the species has large ears compared to its overall size. Although it never appear to be common in any portion of the state, it's distribution is widespread and is among the most commonly observed species during cave surveys.

The species has large ears (30 to 39 millimeters) joined across forehead are a prominent feature in Townsend's Big-eared Bat; the tragus is long and pointed. The dorsal hairs are brownish at the tips, contrasting a little or considerably with the lighter underfur; ventral hairs are dark brownish-gray in color with brown to cinnamon tips. The hairs on the toes do not project beyond the toenails. There are two large, fleshy lumps on the snout, the basis for one of its common names, "lump-nosed bat." Total length is 90 to 113 millimeters; forearm length is 39.0 to 47.6 millimeters; adult mass is 5.0 to 13.5 grams. The greatest length of the skull is 15.2 to 17.4 millimeters; the skull has 36 teeth (Handley 1959, Kunz and Martin 1982, Nagorsen and Brigham 1993).

Diagnostic Characteristics

Townsend's Big-eared Bat differs from other Montana bats by its combination of extremely long, brownish ears that are joined at the base, the prominent lumps on the nose, the absence of large, white spots in the pelage (as with the Spotted Bat) and a dorsal pelage that is darker at the tips than the base (opposite that of the Pallid Bat, which is also larger-bodied).

The species is infrequently captured in mist nets. Nets set over water can be used, but captures are typically rare. The species is more frequently captured by placing nets within tight flyways in high clutter environments such as tall brush and densely forested areas. Surveys of caves and mines are an efficient way to detect the species as it is one of the most commonly encountered species within these features, particularly in the winter. Acoustic methods are effective and call sequences distinct, but echolocation is typically much quieter than other bat species and microphones must be placed close to roosts or foraging areas to ensure any individuals in the area are recorded.

Habitat

Of all of Montana's bat species, Townsend's Big-eared Bat is the most closely associated with caves, mines, and other similar features such as talus caves and erosion cavities found in badlands and river breaks. Caves and abandoned mines are used for maternity roosts and hibernacula (Worthington 1991, Hendricks et al. 1996, Hendricks 2000, Hendricks et al. 2000, Foresman 2012, Hendricks and Kampwerth 2001); use of buildings in late summer has also been reported (Swenson and Shanks 1979). In hibernacula, ambient temperatures ranged from -1.0 to 8.0 degrees (30 to 46 when torpid Townsend's Big-eared Bats were present) (Hendricks and Kampwerth 2001). Temperatures at maternity roosts are poorly documented; the temperature was 12 degrees

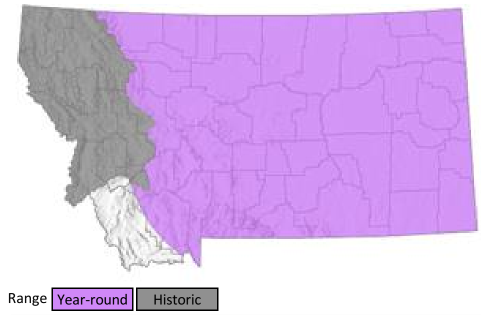
(54 in mid-July near a colony in an abandoned mine in Lake County), and 18 degrees (66 in August near a colony in a large and relatively open cave chamber in Lewis and Clark County). Most caves and mines in Montana appear to be too cool in summer for use as maternity roosts.

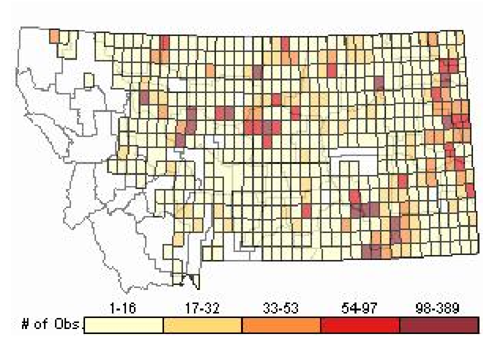
Sharp-tailed Grouse
Tympanuchus phasianellus

View in Field Guide

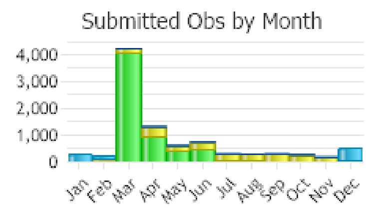
Species of Concern
Native Species
Global Rank: G5
State Rank: SX,S4

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGCN1
PIF: 2





 # Observations: 9336



General Description

Sexes are similar, although males have inconspicuous yellow eye combs and pale violet air sacs on the neck. Both sexes have feathered legs and upper parts mottled with white, buff, brown, and black. The wings have conspicuous white spots, and the breast and flanks have V-shaped brown markings on a snow-white background. Adult males and females average from 16.5 to 18.5 inches in length; adult males average 33 ounces and adult females 29 ounces in weight. Populations west of the Continental Divide that are thought to have been extirpated were, until recently, believed to be a smaller subspecies, the Columbian Sharp-tailed Grouse (*Tympanuchus phasianellus columbianus*). These populations tended to have grayer plumage, more pronounced spotting on the throat, and narrower markings on the underparts (Hoffman and Thomas 2007). However, nuclear and mitochondrial DNA of populations east and west of the Continental Divide overlap almost completely, indicating that Columbian Sharp-tailed Grouse likely never inhabited western Montana and that the declines observed in that region were in populations genetically similar to those on the Great Plains (Spaulding et al. 2006, Wood et al. 2010).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Female Ring-necked Pheasants, especially in the early fall, can be confused with Sharp-tailed Grouse. Sharp-tailed Grouse, however, have much shorter tails, feathered legs, and white bellies (female Ring-necked Pheasants are mottled brown throughout).

Habitat

The habitat is primarily grasslands interspersed with shrub and brush-filled coulees. They prefer stands of inter-mixed tree and shrub grasslands. With high population, they spread into islands of native grassland, usually along drainages surrounded by grainfields. Sharp-tailed Grouse persist only on native bunchgrass-shrub stands. In Idaho, Saab and Marks (1992) found birds selected big sage habitat types during summer. They appeared to prefer range habitats that were in good condition.

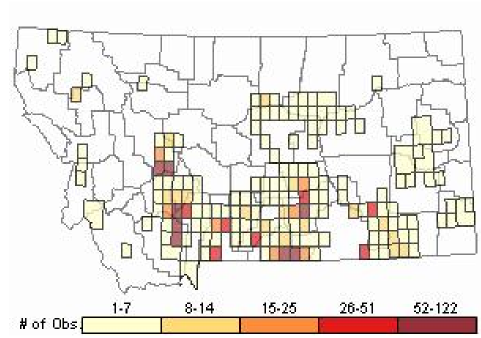
Until recently, Sharp-tailed Grouse in Montana were found west of the Continental Divide in larger mountain valleys with extensive native bunchgrass-shrub stands. However, they have now apparently been extirpated, or nearly extirpated, from this historic range (Hoffman and Thomas 2007).

Pinyon Jay
Gymnorhinus cyanocephalus

View in Field Guide

Species of Concern
Native Species
Global Rank: G3
State Rank: S3

Agency Status
USFWS: MBTA; BCC10; BCC17
USFS:
BLM:
FWP SWAP: SGCN3
PIF:



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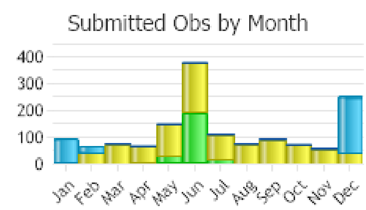


General Description

Pinyon Jays are small-medium and crestless, about 26-29 cm in total length. The bill is more pointed and the tail shorter than in other jays. Adult plumage is entirely dull blue, except chin, throat and breast region streaked whitish, and inner webs of primaries black. Sexes are alike in appearance, except crown is slightly deeper blue in males and female bill is slightly longer.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Distinguished from all other sympatric jays by the combination of overall blue color, shorter tail, and lack of crest.

Habitat

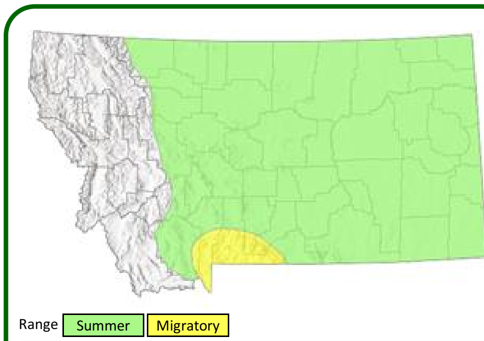
Pinyon Jays are closely associated with pinyon-juniper habitat in the southwestern U.S., but in Montana they occur in low-elevation ponderosa pine and limber pine-juniper woodlands. They build bulky cup nests of twigs and grasses and place them on horizontal limbs of pines. The few nests reported from Montana have been in ponderosa pines (Cameron 1907) or limber pines (T. McEneaney, personal communication).

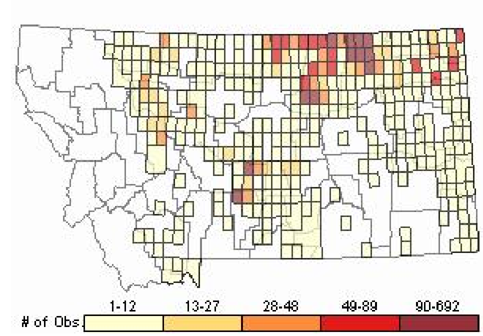
Sprague's Pipit
Anthus spragueii

View in Field Guide

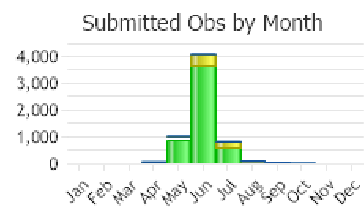
Species of Concern
Native Species
Global Rank: G3G4
State Rank: S3B

Agency Status
USFWS: MBTA; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 1





 # Observations: 6099



General Description

The adult Sprague's Pipit is a pale, slender, sparrow-sized bird with white outer tail feathers, a thin bill, pale legs, and a heavily streaked back. Adults reach a length of 6.5 inches (16.5 cm), with a wingspan of 10 inches (25.4 cm), and a weight of 23.7 to 24.0 grams. The sexes are alike. The sides of the head and indistinct buffy eye-rings are pale. The lores contrast with dark brown eyes and the ear coverts are plain brownish-buff, usually with a slight reddish tinge. The crown, sides and rear of neck are buffy with sharply defined black streaks. The back is light sandy-brown with broad black streaks, with a paler more prominent buffy stripe down each side. The wings, 7.7 to 8.5 cm long, have blackish-brown feathers with whitish to buffy-brown edging, and two whitish wing bars. The rump and upper tail coverts, paler than the back, are sandy-brown with narrow black streaks. The blackish-brown feathers of the tail have buffy edging and the outer two pairs of feathers are white. The breast is a bright dark buff with a necklace of narrow black streaks. The flanks are brownish-buff and without streaks. The legs of the adults are pale brown, flesh or yellowish-brown, while they are pinkish in the juveniles (Godfrey 1966, Maher 1979, King 1981, Robbins and Dale 1999).

On the ground, the bird is extremely secretive and flies away in a long, undulating flight when approached. It walks instead of hops and usually only lands on the ground. The bird is most easily detected by its unique flight song given high overhead (as high as 75 meters); a high-pitched, thin "jingling" sound that can continue for as long as an hour (Peterson 2002, King 1981). Johnsgard (1992) notes that the species' spectacular circular song-flight display around its territory, during which its white outer tail feathers are conspicuously spread, compensates for its particularly inconspicuous plumage.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The buffy-brown back with blackish streaking, white wing bars, dark streaked crown, and pale legs distinguish this pipit from the American Pipit, the other species with whom its plumage is most similar (Robbins and Dale 1999, Sibley 2000). Additional characteristics identifying Sprague's Pipit include pale buffy to whitish ear coverts, extensive white on the outer tail feathers, a pale lower mandible, a darker upper mandible, and a diagnostic single-syllable, squeaky, quick call (Robbins and Dale 1999, Sibley 2000). While the Sprague's Pipit is a species of the prairie, the American Pipit typically favors wetter areas and perches more conspicuously (on fences, telephone wires, and treetops) than the Sprague's Pipit (Robbins and Dale 1999).

Habitat

An endemic grassland bird, the Sprague's Pipit prefers native, medium to intermediate height prairie (Casey 2000) and in a short grass prairie landscape, can often be found in areas with taller grasses (Samson and Knopf 1996). The Sprague's Pipit is significantly more abundant in native prairie than in exotic vegetation (Dechant et al. 2001). Dechant (2001) also notes that the species has been shown to be area sensitive, requiring relatively large areas of appropriate habitat; the minimum area requirement in a Saskatchewan study was 190 hectares (470 acres). This pipit is also known to utilize and breed in alkaline meadows and around the edges of alkaline lakes (Johnsgard 1992).

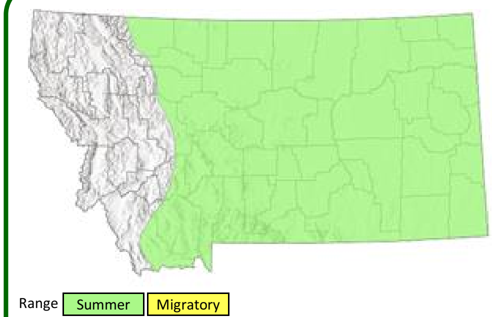
Black-billed Cuckoo

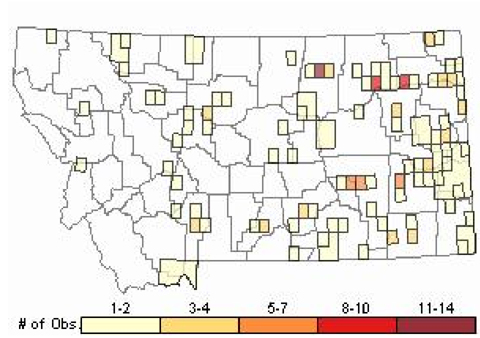
Coccyzus erythropthalmus

View in Field Guide

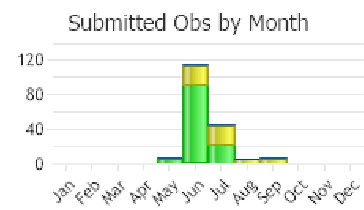
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3, SGIN
PIF: 2





 # Observations: 188



General Description

The Black-billed Cuckoo is a 31 centimeter-long bird with a stout slightly decurved bill, zygodactyl feet, grayish-brown dorsum, white venter (except tail), and a long tail that is patterned on the underside in gray with white feather tips. The bill is usually all dark, and may show yellow at the base of the lower mandible. There is a reddish eye ring. In juveniles, the undertail is whiter, the eye ring is buffy, the pale underparts may have a buffy tinge, and there may be some rusty-brown color on the outer wing.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Black-billed Cuckoo differs from the Yellow-billed Cuckoo (*Coccyzus americanus*) by lacking rufous primaries and the absence of an extensively yellow lower mandible.

Habitat

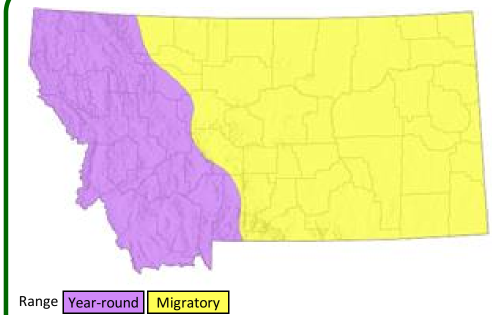
Black-billed Cuckoos are birds of wooded draws, forest edges, thickets, and shelterbelts. In Montana they are found most often in riparian cottonwoods, green ashes, and American elms with a shrubby understory of willows, box elders, and alders; they also occur in foothill deciduous woodlands (Skaar 1969; Walcheck 1969, 1970; Kroodsma 1973; Jones and Hansen 2009).

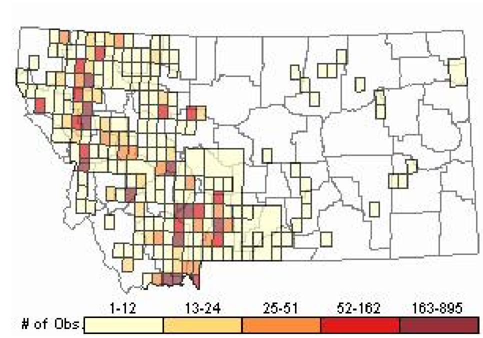
Trumpeter Swan
Cygnus buccinator

View in Field Guide

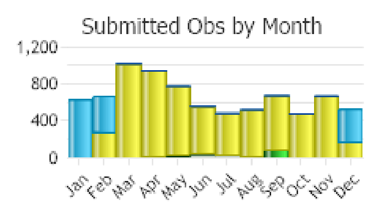
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS: MBTA
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 1





 # Observations: 7976



General Description

Trumpeter Swans are the largest waterfowl in North America. They can be up to 5 feet in length, have a wingspan up to 80 inches (almost 7 feet) and weigh over 20 pounds. Males are larger than females, but otherwise the sexes are similar in appearance. The adult Trumpeter Swan is entirely white, although the head and neck are sometimes stained an orange color due to iron-rich waters and mud where they forage for food. The webbed feet and legs are black. The bill is straight, rarely shows any yellow spot in front of the eyes (lores) and also is black. Sometimes the lower mandible shows a salmon-red line along the upper edge (Mitchell 1994). Juvenile swans are mostly white, but can retain a gray or brown head, neck and body feathers. Their feet may be yellowish, grayish or dull black. Hatchlings (cygnets) are all gray in color and have pinkish feet and a black and pink bicolored bill (Mitchell 1994).

The vocalization of Trumpeter Swans is limited to only a call sounding like "*oh-OH*". They can make this call either with their mouths open (louder) or closed (nasal-like). Other sounds made include peeps, hisses and gurgles (Mitchell 1994).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Trumpeter Swans are similar in appearance to, but larger than, Tundra Swans. Trumpeter Swans rarely show any yellow on the lores, while Tundra Swans have very evident yellow lores (Mitchell 1994). The easiest method of separation between these two species is vocalization. Trumpeter Swans are less vocal, much lower pitched and have a more nasal quality than the louder, clearer sounds of Tundra Swans (Sibley 2000). Trumpeter Swans are also similar in size and weight to the introduced Mute Swans. However, the bill of Mute Swans is mostly orange rather than all black. Also, male Mute Swans have a black knob at the base of the bill. Trumpeter Swans do not have this knob (Mitchell 1994).

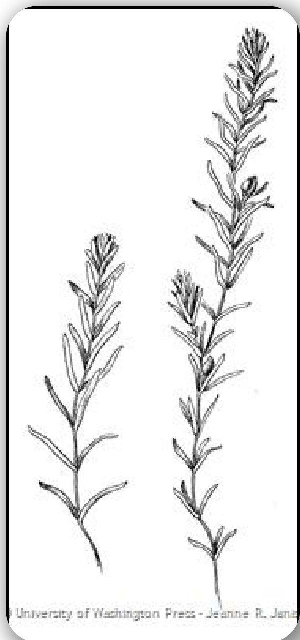
Habitat

The breeding habitat for Trumpeter Swans in the Red Rock Lakes/Centennial Valley of Montana includes lakes and ponds and adjacent marshes containing sufficient vegetation and nesting locations. Along the Rocky Mountain Front the breeding habitat is small pothole lakes, generally with sufficient water to maintain emergent vegetation through the breeding season (Montana Natural Heritage Program Point Observation Database). Habitat requirements for breeding include room to take off (~100 m), shallow, unpolluted water with sufficient emergent vegetation and invertebrates, appropriate nest sites (i.e. Muskrat lodges), and areas with little human disturbance (Mitchell 1994).

Their nonbreeding habitat in Montana is the many large and small lakes and ponds in extreme southern Montana, including the breeding area of the Red Rock Lakes/Centennial Valley. Trumpeter Swans also winter in the Ennis Lake and Madison River complex, as well as Hebgen Lake and the surrounding area. During winter appropriate habitat is areas where water does not freeze and food is plentiful and accessible. Trumpeter Swans will move out of one lake or pond to another if conditions become too severe.

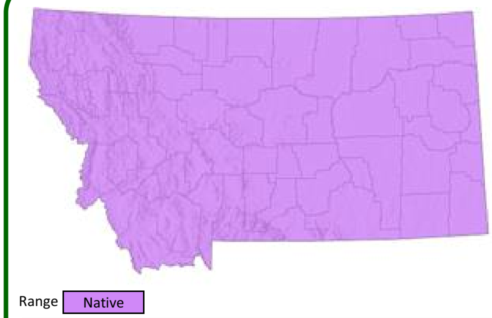
Long-sheath Waterweed
Elodea bifoliata

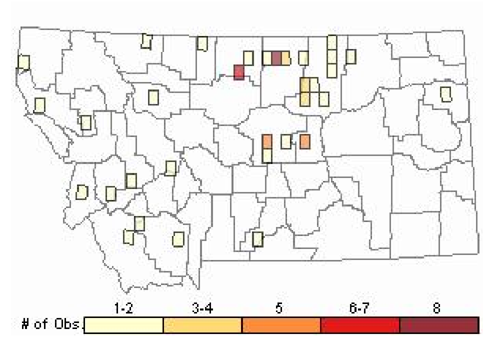
View in Field Guide



Species of Concern
Native Species
Global Rank: G4G5
State Rank: S2?

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 8





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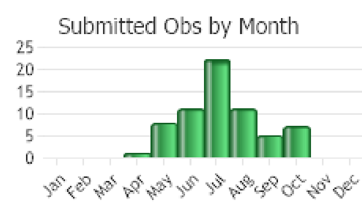


General Description

Leaves opposite, 10–20 × 1.5–2.5 mm, minutely serrate, narrowly lanceolate to linear. Male flowers: spathe 2–5 cm long, inflated above; sepals 3–5 mm long; petals 4–5 mm long; stamens 7 to 9. Female flowers: spathe 3–7 cm long, slightly inflated above; sepals 2–3 mm long; petals 3–4 mm long. Capsule 8–10 mm long (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Phenology

Flowering in late June-July.

Diagnostic Characteristics

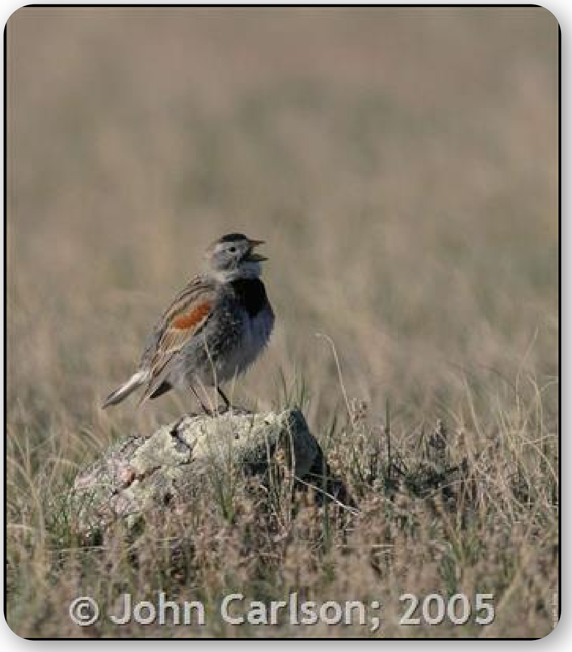
Elodea can be distinguished from other aquatic plants by the long-stalked, floating flowers. *Elodea bifoliata* can be distinguished from other members of the genus by its opposite rather than whorled leaves.

Habitat

Shallow water of ponds and lakes on the plains.

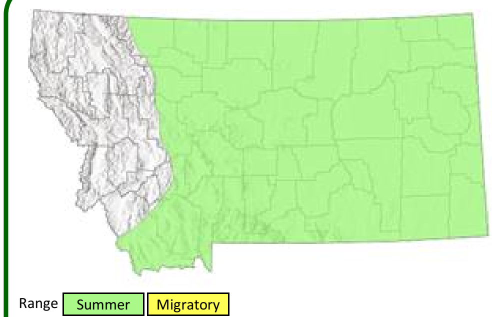
Thick-billed Longspur
Rhynchophanes mccownii

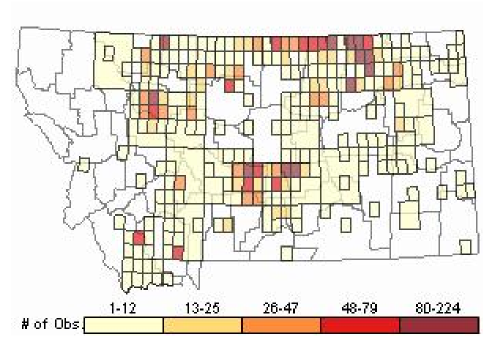
View in Field Guide



Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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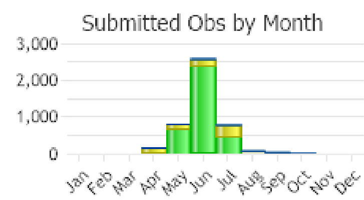


General Description

A chunky, sparrow-sized bird about 15 cm in length with a short tail and large bill. The name "longspur" references an elongated claw on the hallux (hind toe). The breeding male is gray with a black bill, crown, malar stripe, and upper breast; a blackish wash on lower breast and belly; and chestnut median coverts. The breeding female, also gray but without the black plumage of males, has a pale bill; median coverts and scapulars have a rusty tinge (With 2010).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Identification of breeding males is straightforward, as their combination of plumage characters is unique among North American passerines; however, females, non-breeding males, and immatures are drab and less easily distinguished. McCown's are most likely to be confused with Chestnut-collared Longspurs, but have larger, paler bills (often with a darkish tip) and longer wing projections. In all plumages, tail pattern (extensive white with inverted black "T") can be used to distinguish McCown's from other longspurs, though this may be difficult in the field (With 2010).

Habitat

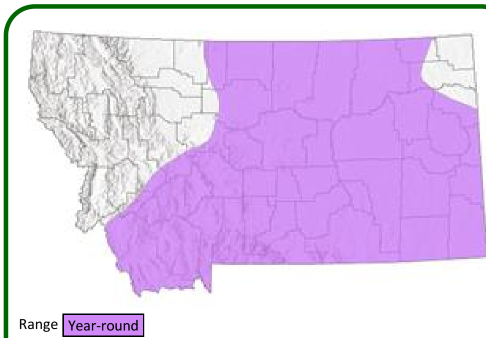
Semi-arid shortgrass steppe, characteristically open with sparse vegetation, provides nesting habitat; so do structurally similar habitats like overgrazed pastures (With 2010).

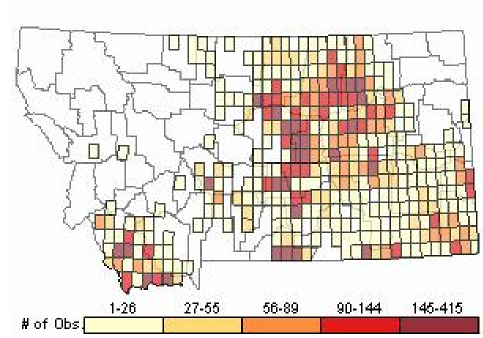
Greater Sage-Grouse
Centrocercus urophasianus

View in Field Guide

Species of Concern
Native Species
Global Rank: G3G4
State Rank: S2

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN2
PIF: 1





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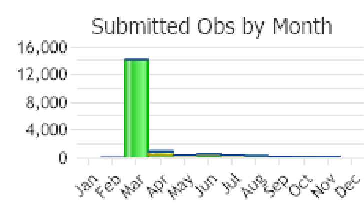


General Description

[From Schroeder et al. 1999] North America's largest grouse. Males 1.7-2.9 kg and 65-75 cm long, females 1.0-1.8 kg and 50-60 cm long. Both sexes with relatively long, pointed tails, feathered legs, and mottled gray-brown, buff, and black plumage. Males have a blackish-brown throat patch and an inconspicuous yellow eye comb. Both sexes have blackish bellies which contrast sharply with white under-wing coverts when birds in flight. Females appear to dip from side to side while flying.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

In central Montana, males occupy leks from early March to early June with peaks in late April to early May, females attend leks mid-March to late May with peaks in early to mid-April, copulations early April to late May (Eng 1963; Wallestad 1975b; Jenni and Hartzler 1978). Nesting begins mid-April, first eggs hatch in late May with peak by first half of June (42% of nests in south-central Montana hatch prior to mid-June), hatching extends to late June and early July (Eng 1963; Wallestad 1975b; Eustace 2002). In southeastern Alberta, peak hen attendance at leks early April, incubation at first nests initiated late April to early May (mean = 3 May), second nest attempts late May to mid-June (Aldridge and Brigham 2001). Birds in north-central Montana move to wintering grounds in November, remain there until mid-March and early April (Tack et al. 2011; Smith 2013); in southwest Montana, move to wintering areas sometime in September/October, return to leks in late February (Roscoe 2002).

Diagnostic Characteristics

Female Ring-necked Pheasant (*Phasianus colchicus*) can possibly be confused with female or young Greater Sage-Grouse. Female pheasants have a brown belly and bare legs, female Greater Sage-Grouse have a black belly patch and feathered legs. Differ from Sharp-tailed Grouse (*Tympanuchus phasianellus*) in having a black belly and lacking white outer tail feathers. Hybrid Greater Sage-Grouse X Sharp-tailed Grouse infrequent across range but reported in central Montana, southeastern Alberta, western North Dakota (Eng 1971; Kohn and Kobriger 1986; Aldridge et al. 2001).

Habitat

Closely associated with sagebrush habitat types. Adapted to a broad mosaic throughout range, including relatively tall sagebrush (*Artemisia tridentata, A. tripartita, A. cana*), relatively low sagebrush (*A. arbuscula, A. nova*), forb-rich mosaics with low and tall sagebrush, riparian meadows, steppe, scrub willow, sagebrush savanna (with juniper, ponderosa pine, aspen). Use altered habitats, such as alfalfa, wheat, crested wheatgrass, but degree depends on association with native habitat. Leks in sites with reduced herbaceous and shrub cover surrounded by potential nesting habitat, often on broad ridgetops, grassy swales, disturbed sites, dry lake beds, cultivated fields. Nesting habitat usually in thick shrub cover dominated by sagebrush, sometimes grass or other shrub species. Brood habitat a mosaic of sagebrush, riparian meadow, greasewood, alfalfa, grain fields, rich in forbs and insects. Winter range similar to breeding range and dominated by sagebrush cover types (Schroeder et al. 1999; Crawford et al. 2004). Annual variation in habitat use in Montana similar to most surrounding areas (Dusek at al. 2002); sagebrush removal results in decline or loss of sage-grouse (Martin 1970; Wallestad 1975a; Swenson et al. 1987), as does habitat fragmentation/disturbance of sagebrush related to coal-bed natural gas energy development (Walker et al. 2007).

Leks in Montana often in clearings surrounded by sagebrush, including natural clearings, old burns, clearings around abandoned homesteads. When not on lek, males in central Montana feed and loaf predominantly where sagebrush cover is 20-50% (mean = 32%), avoid sagebrush cover < 10% (Wallestad and Schladweiler 1974; Wallestad 1975b; Dusek at al. 2002). In Beaverhead County, some males moved from leks to irrigated hayfields/wetlands with adjacent sagebrush patches, others to a variety of sagebrush habitats (Wyoming big sage, mountain big sage, three-tip sage), eventually to high elevation dense sagebrush (25-35% canopy cover) surrounded by forest (Roscoe 2002).

Females establish nests where sagebrush cover exceeds 15%, height of sagebrush averages 40.4 cm (Wallestad and Pyrah 1974). Similar results for Powder River Basin (including southeastern Montana), with average sagebrush canopy cover of 19.1% at nests; sites much more likely to be used for nesting when 75% of area within 100 m (patches of sage at least 200 m diameter) was high-density sagebrush (> 40% canopy cover) (Doherty et al. 2010); 99% of 258 nests in Phillips County established under shrubs, most of these (92%) under sagebrush (Moynahan et al. 2007). In Beaverhead County, hens nest in some cases near irrigated hayfields/wet meadows with adjacent sagebrush patches (Roscoe 2002). In southeastern Alberta, 90% of 29 nests placed under silver sage in locations where sage was taller and denser than at random: mean sage canopy cover = 32%, mean sagebrush height = 41.3 cm (Aldridge and Brigham 2002).

Brood habitat in central Montana dominated by relatively open stands of sagebrush. In one study (Peterson 1970), 100% of brood occurrences in sagebrush in June, declining to 50% by September (with corresponding increase in use of grass and greasewood); average cover of sagebrush on brood sites increased from 6% in June to 12% in August , with average height of sagebrush ranging from 40.6 cm in June to 50.8 cm in September. In a second study, (Wallestad 1971, 1975b) sagebrush cover at brood sites averaged 14% in June, 10% in August, 21% in September, with overall forb cover in two years of 17-27% and grass cover 47-51%; mean shrub heights were 17.8 cm in June, 25.4 cm in August. In Beaverhead County, Montana brood canopy cover during June-September averaged 24% shrubs (mostly sagebrush), 35% grass, 22% forbs, with average height of sagebrush 22.9-38.1 cm at brood locations (Martin 1970). In southeastern Alberta, brood habitat was in silver sagebrush denser and taller than at random: 20.9% mean sagebrush canopy cover, 32.0 cm mean sagebrush height (Aldridge and Brighan 2002).

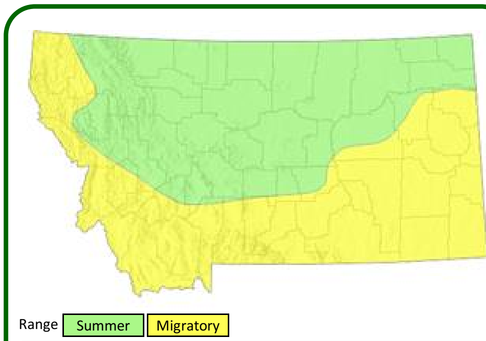
Winter habitat in central Montana generally relatively tall, dense, and extensive sagebrush stands with 20% or greater mean canopy cover (range= 6.4-53.9%) for both feeding/loafing and roosting sites (about 78-82% of all observations fall in this cover category); height of sagebrush for feeding/loafing and roosting sites averages about 25.4 cm (Eng and Schladweiler 1972; Wallestad 1975b). More open stands used as weather moderates prior to lek formation. In Powder River Basin (including Bighorn, Rosebud, Powder River counties, Montana), use areas where sagebrush and grass >95% of total vegetation cover on landscape, with sagebrush cover averaging 75% (Doherty et al. 2008). Tall dense stands of sagebrush the primary winter habitat in Beaverhead County (Roscoe 2002).

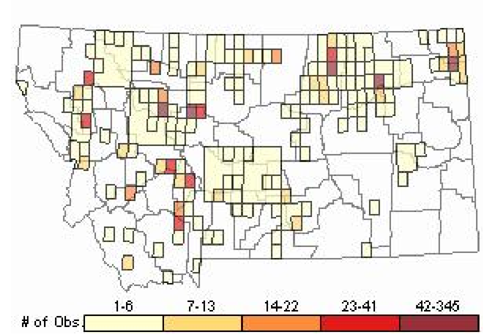
Common Tern
Sterna hirundo

View in Field Guide

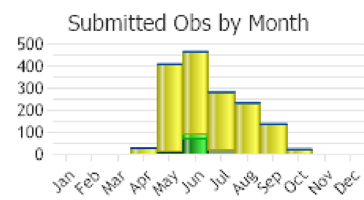
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





 # Observations: 1587



General Description

In breeding plumage, the Common Tern has an orange-red bill tipped in black and orange-red legs. The back, body, and wings are a silvery-gray with blackish primaries on the wingtips, evident during flight. The nape and cap are black and extend low enough on the head to contain the black eye before abruptly stopping at the white of the cheek and neck. The outer tail feathers on the forked tail are dusky. In non-breeding plumage the bill and legs lose their red coloration and are black. The cap no longer covers the forehead, leaving a white patch nearly to the top of the head (Sibley 2000).

The vocalization is described as numerous, varied, and of sharp, distinctive, and somewhat irritable timbre (Nisbet 2002). The most common call, the advertising call, is described as a down-slurring "*keeyuur*" or an up-slurred "*keeuri*" in addition to the "*kip*" or "*tyik*" call that is expressed during flock feeding, or during take-off and landing (Sibley 2000, Nisbet 2002).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Distinguishable from Forster's Tern (*S. forsteri*) by the Forster's Tern's whiter underparts, lighter primaries, lighter back coloration (and, hence, less difference in color between back and tail), and greater amount of black on a bill that is more orange than red-orange (Sibley 2000, Nisbet 2002).

Habitat

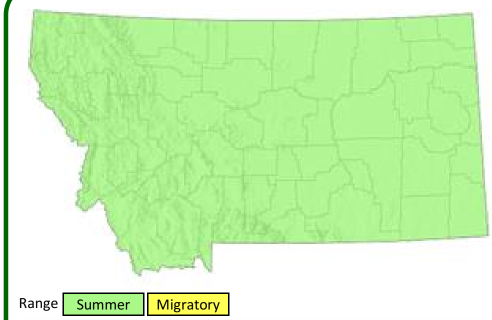
Nesting in Montana generally occurs on sparsely vegetated islands in large bodies of water, such as Medicine Lake and Bowdoin National Wildlife Refuge. Nest substrate at these locations includes sparsely sandy, pebbly, or stony substrate, surrounded by matted or sparsely scattered vegetation (Casey 2000, Nisbet 2002). A study in the Lewistown District of the Bureau of Land Management documented that the Common Tern selected sites larger than 30 acres, with emergent vegetation covering more than 25% of the shoreline on all but one of the eight sites studied (Feigley 1997). All nesting occurred on islands (Feigley 1997).

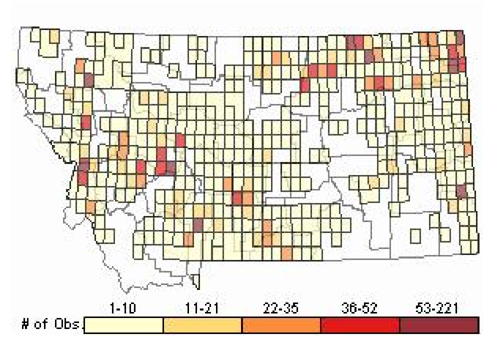
Bobolink
Dolichonyx oryzivorus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10; BCC11; BCC17
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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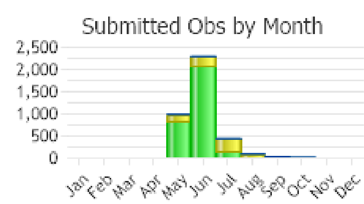


General Description

The Bobolink is approximately 18 centimeters long with a stout, relatively short, pointed bill and sharply pointed tail feathers. The breeding male is black below, with a buff to whitish hind-neck, white scapulars, and white rump; early in spring the male has pale feather edgings. The breeding female is buffy with dark streaks on the back, rump, sides, and head. The juvenile resembles the breeding female but lacks streaks below. Fall adults and immatures resemble breeding female but are darker above and richer buff below. (Renfrew et al. 2015)

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Breeding males are unique among North American passerines in being entirely black underneath and lighter above (Renfrew et al. 2015).

Habitat

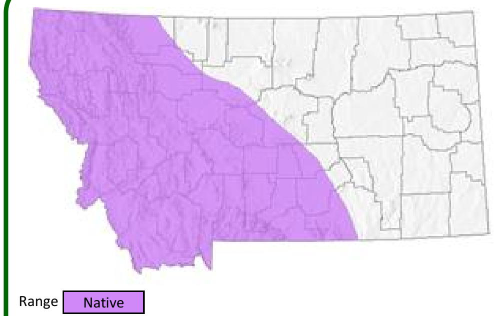
Nests built in tall grass and mixed-grass prairies. Prefers "old" hay fields with high grass-to-legume ratios.

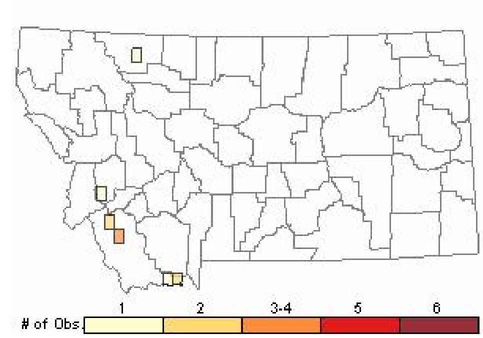
Fleshy Stitchwort
Stellaria crassifolia

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 5





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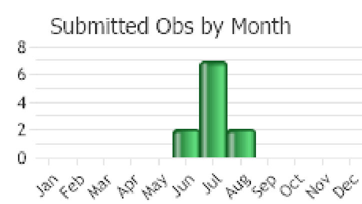


General Description

Fleshy Stichwort is a glabrous perennial herb with numerous, often matted, ascending to nearly prostrate stems that are 5-15 cm long and arising from slender roots. The opposite, narrowly lance-shaped leaves are 5-10 mm long, lack petioles, and have entire margins. Solitary flowers are borne on long spreading stalks in the upper leaf axils. The 5 separate, lance-shaped sepals are 2-3 mm long and have membranous margins. The 5 white, deeply bilobed petals are slightly longer. The fruit is a narrowly egg-shaped capsule that is 1-2 mm longer than the sepals at maturity.

Phenology

Flowering in August, mature fruit in August-September.

Diagnostic Characteristics

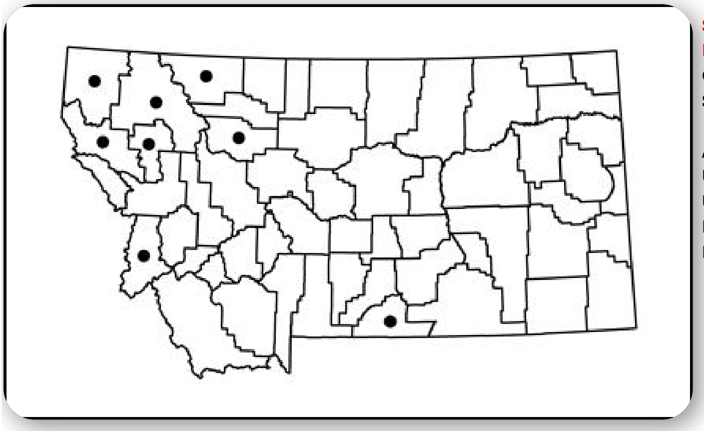
The more common *S. longipes* has stiff leaves and sepals greater than 3 mm long. *Stellaria calycantha* and *S. umbellata* have petals, if present, that are shorter than the sepals. A hand lens will likely be needed for identification.

Habitat

Moist or wet meadows, often along streams, in the foothills to alpine zones.

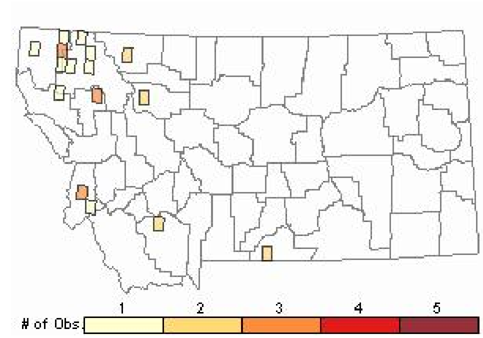
Meesia Moss
Meesia triquetra

View in Field Guide



Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank:



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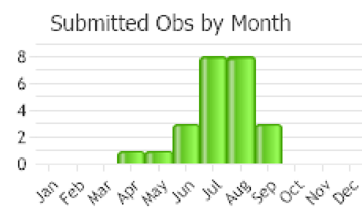


General Description

Plant: Acrocarpous (Vitt 1988), scattered or tufted. Dark green to yellow-green, often blackish below. Stems 2-14 cm tall, simple, but occasionally a little branched. Rhizoids papillose.

Leaf: When dry, leaves somewhat contorted. When moist, leaves squarrose. Leaves 2-3.6 mm long, triangular-lanceolate, and with a sheathing base. Margins plane or sometimes recurved at mid-leaf and serrate for most of its length. Costa ends before the apex or is almost percurrent and is narrow (less than 1/5 width of leaf at base).

Leaf Cells: Upper and median leaf cells about 15 µm wide, rectangular to hexagonal. Basal laminal cells elongate and somewhat hyaline. The costa in X-S has small, thick-walls except for the ventral and dorsal layers. Leaf cells are very large and easy to see with a hand lens.

Diagnostic Characteristics

Three-ranked and widely spreading leaves with serrulate margins frequently distinguish this moss. The similar *M. longiseta* is synoicous and has smooth leaf margins (FNA 2014).

Habitat

Wet soil and peat in fens and bogs (Elliott 2016), soil in wet woods.

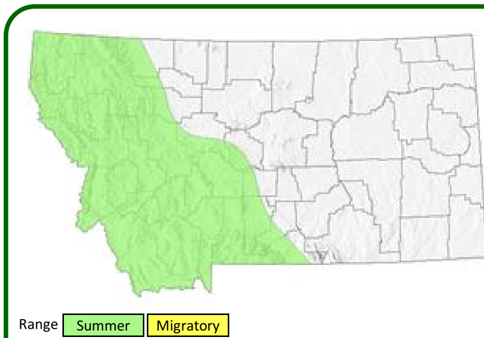
Harlequin Duck

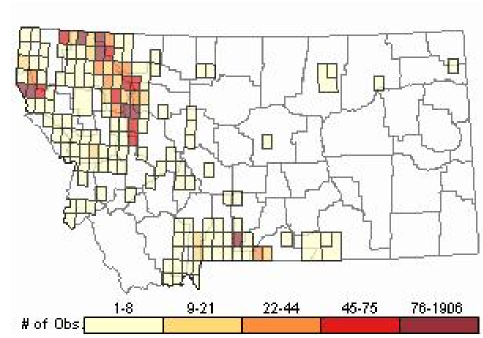
Histrionicus histrionicus

View in Field Guide

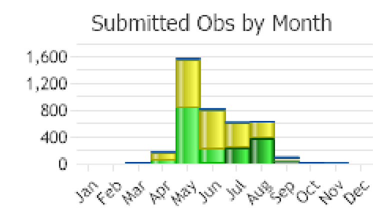
Species of Concern
Native Species
Global Rank: G4
State Rank: S2B

Agency Status
USFWS: MBTA
USFS: SENSITIVE
BLM:
FWP SWAP: SGCN2
PIF: 1





 # Observations: 4026



General Description

The Harlequin Duck is unique among North American waterfowl for breeding and foraging in clear, fast-flowing rivers and streams. The breeding plumage of adult males is unmistakable, with slate blue, white, black, and chestnut markings. This species is also unusual in its vocalizations; males and females give a mouselike squeak. The Harlequin Duck overwinters along coastal rocky shorelines (Robertson and Goudie 1999).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

In Montana, adults arrive from late April to early May (Kuchel 1977, Reichel and Genter 1996). Males depart breeding grounds in June while females and young depart from late July to early September (Kuchel 1977, Reichel and Genter 1994). Egg-laying occurs between April 30 and July 4 (Kuchel 1977, Reichel and Genter 1996). Kuchel (1977) estimated hatching dates for broods on McDonald Creek, Glacier National Park: 13 of 15 occurred between June 27 and July 7 with extremes on June 11 and August 2. Young fledge in Montana between July 15 and September 10, with most fledging between July 25 and August 15 (Kuchel 1977, Reichel and Genter 1996). Transients and winter observations recorded from October-March. Pairs observed beginning in April and May (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

The Harlequin Duck is a small diving duck. Male is larger than female. Breeding plumage of male is unmistakable: the body is slate blue with white bands and collars, bordered with black lines on chest and neck; large white crescent in front of eye with small white circular patch near ear; white vertical stripe on side of neck; black streak bordered by white and amber lines on top of head; iridescent blue secondaries; dark-slate-blue belly and chestnut-brown flanks. Adult female has brown body plumage, a white belly, with brown checks or spots, a round white spot behind ear, faded variable white patches in front of eye, and occasionally white streaks on back of head. Juveniles and immatures are similar to female, but feet are typically yellow, not gray (Robertson and Goudie 1999).

Habitat

In Montana, Harlequin Ducks inhabit fast moving, low gradient, clear mountain streams. In Glacier National Park, birds used primarily old-growth or mature forest (90%); and 2) most birds in streams on the Rocky Mountain Front were observed in pole-sized timber (Diamond and Finnegan 1993). Banks are most often covered with a mosaic of trees and shrubs, but the only significant positive correlation is with overhanging vegetation (Diamond and Finnegan 1993, Ashley 1994).

The strongest stream section factor in Montana appears to be for stream reaches with at least two loafing sites per 10 meters (Kuchel 1977, Diamond and Finnegan 1993, Ashley 1994). Broods may preferentially use backwater areas, especially shortly after hatching (Kuchel 1977), though this is not apparent in data from other studies (Ashley 1994). Stream width ranges from 3 m to 35 m in Montana. Harlequin Ducks in Glacier National Park used straight, curved, meandering, and braided stream reaches in proportion to their availability (Ashley 1994).

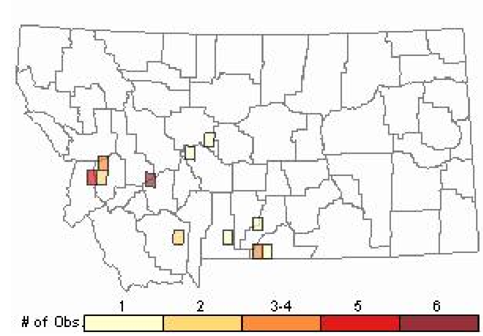
Musk-root

Adoxa moschatellina

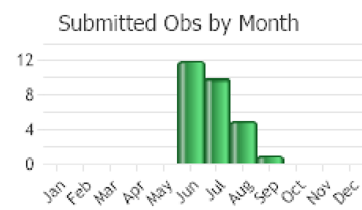
View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 3
C-value: 9



 # Observations: 28



General Description

Musk-root is a small, delicate, musky-scented herbaceous perennial, 5-20 cm tall. The several basal leaves have long petioles and blades divided into threes 2-3 times, with the ultimate segments broadly egg-shaped and lobed. There is one opposite pair of smaller stem leaves which are less dissected. Usually 5 flowers are borne in a compact head-like inflorescence at the tip of the stem. The inconspicuous, yellowish-green flowers, 5-8 mm wide, are of two types: outside flowers usually have 3 sepals and 5 united petals, while the terminal flowers have 2 sepals and 4 united petals. The sepals are united to the wall of the ovary. The small dry fruit has 4-5 seeds.

Phenology

Flowering occurs in June and early July, and fruiting continues through July.

Diagnostic Characteristics

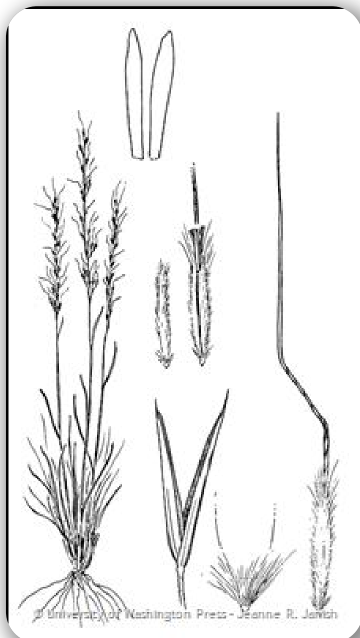
The leaves of this unusual plant resemble those of *Aquilegia* spp., and the flowers superficially resemble those of some *Saxifraga* spp., but it differs in having only 2-3 sepals. This monotypic family is most closely related to the Valerian Family from which it differs in having twice as many stamens as petals.

Habitat

Vernally moist places in the mountains at the bottom of undisturbed, open rock slides that have cold air drainage.

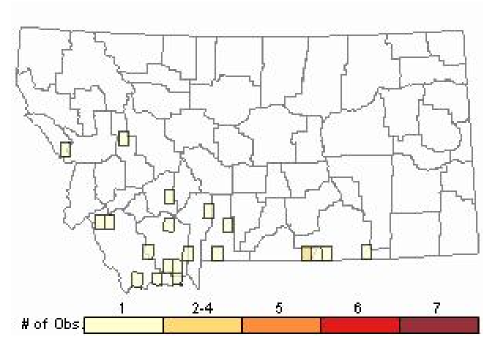
Letterman's Needlegrass
Stipa lettermanii

View in Field Guide



Species of Concern
Native Species
Global Rank: G5
State Rank: S1S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value:



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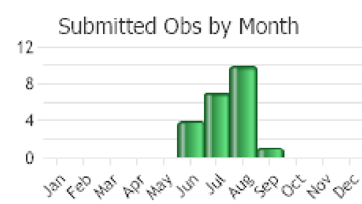


General Description

Perennial bunchgrass. Stems 30–60 cm. Leaves: blade 0.5–2 mm wide, essentially hairless at throat region; ligule 3–4 mm long. Inflorescence a contracted panicle 10–15 cm long. Spikelets 7–9 mm long. Lemmas with dense appressed hairs, awn 1–2 cm long (Lavin in Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Phenology

Fruiting in late June-July.

Habitat

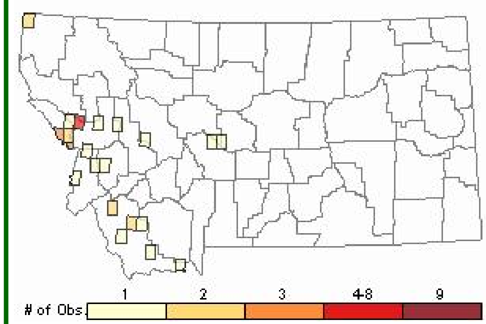
Open understory at middle to high elevations (Lesica et al. 2012).

A Caddisfly
Rhyacophila betteni

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G2G4
State Rank: S3S4

Agency Status
USFWS:
USFS:
BLM:



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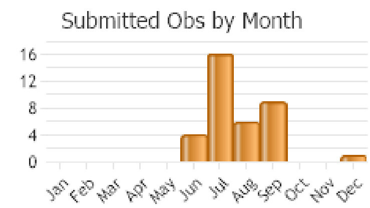


General Description

Information on this species is incomplete.

Habitat

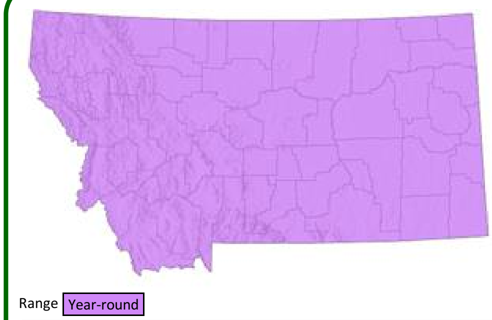
A large variety of cold mountain streams and rivers.

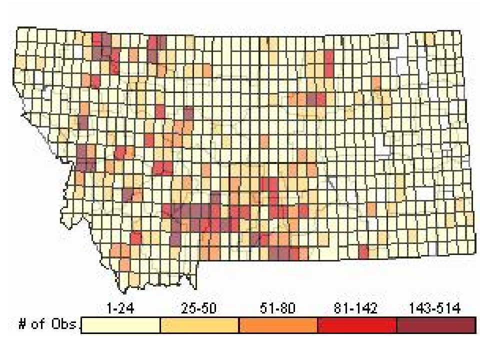
Golden Eagle
Aquila chrysaetos

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: BGEPA; MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF:





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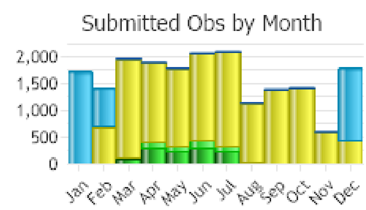


General Description

Adults are brown overall, gold on head and neck feathers, with light brown bands in the tail. Immature birds have white patches on the wings and white at the base of the tail feathers. Golden Eagles often soar with their wings held nearly flat, but slightly upturned. The legs are heavily feathered down to the tops of the toes. Golden Eagles range in length from 33 to 38 inches, and have a wingspan of 6-1/2 to 7-1/2 feet. A very large raptor with mostly brown plumage, a golden wash on the back of the head and neck, and a mostly horn-colored bill; tail is faintly banded; immatures have white at the base of the primaries and and white tail with a dark terminal band; total length 76 to 102 cm, wingspan 203 to 224 cm.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Bald Eagles have feathers only part way down the leg, and usually soar with wings held completely flat. Immature Bald Eagles usually have a strip of white along the underside of the wing, rather than in a round patch on the flight feathers like the immature Golden Eagle. Older immature Bald Eagles have irregular patches of white on their bodies, instead of the sharply defined patterns on Golden Eagles. Turkey Vultures soar with wings held in a more pronounced "V".

Habitat

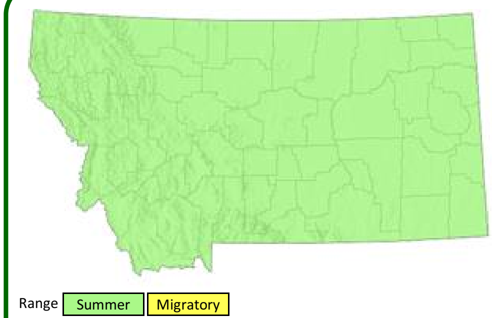
Golden Eagles nest on cliffs and in large trees (occasionally on power poles), and hunt over prairie and open woodlands; some nest sites in the Fallon area include scoroacious badland pillars (Cameron 1905), another near Knowlton was in a ponderosa pine (Cameron 1907). In the Livingston area 62% of 92 nests were on cliffs, 29% in Douglas-fir, and 2-3% each in ponderosa pine, cottonwood, snags, and on the ground (McGahan 1968). About 70% of cliff nests were oriented to the south or east, most nests were found between 4000-6000 ft elevation, and sites were associated with sagebrush/grassland hunting areas (McGahan 1968). In the Bozeman area, Golden Eagles move from mountains to valleys in the winter (Skaar 1969).

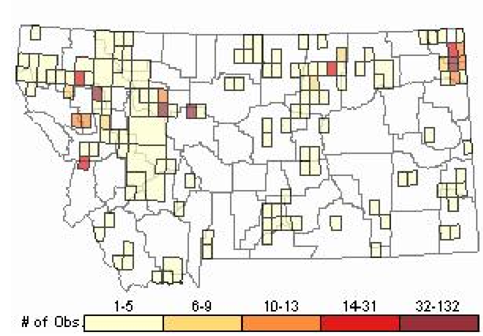
American Bittern
Botaurus lentiginosus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 3





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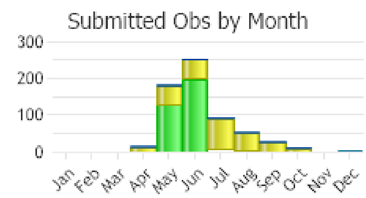


General Description

A stocky wading bird with a straight pointed bill, relatively short neck and legs, and somewhat pointed wings; darker flight feathers; bill dull yellow with a dusky tip on the upper mandible; legs and feet are greenish yellow; breeding feathering includes generally inconspicuous white ruffs on the shoulders and two small green patches on the back; wing span 107 cm. The American Bittern is a brown, medium-sized heron, 60-85 cm long, with a stout body and neck and relatively short legs (Palmer 1962, Cramp 1977, Hancock and Kushlan 1984). Adult plumage is all brown above and finely flecked with black; heavily streaked with brown and white below. The crown is rusty-brown. An elongated, black patch extends from below the eye down the side of the neck, a characteristic unique among herons (Hancock and Kushlan 1984). The throat is white. Sexes are similar, except that the male is slightly larger (Gibbs et al. 1992). Juveniles differ only in lacking black neck patches, which are obtained in the first winter. Plumage does not change seasonally.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Differs from night-herons in the following ways: wings are pointed rather than rounded; flight feathers are much darker than back (vs. no contrast), upperparts lack white spotting; and bill is more slender. Much larger than the Least Bittern (average length 71 cm vs. 33 cm). Differs from similar juvenile Green Heron in being larger (length 71 cm vs. 46 cm) and in having flight feathers of wings obviously darker than the middle of the back.

Habitat

American Bitterns favor large freshwater wetlands with tall emergent vegetation such as cattails and bulrushes. Sparsely vegetated wetlands are occupied occasionally, tidal marshes rarely. The typical nest is a platform of dried rushes, sedges, and cattails placed in dense emergent vegetation over shallow water (Gibbs et al. 1992). Bitterns forage along shorelines, in dense marsh vegetation, and in wet meadows. Winter range include areas where temperatures stay above freezing and waters remain open. Managed wetlands, such as those at wildlife refuges, are often used.

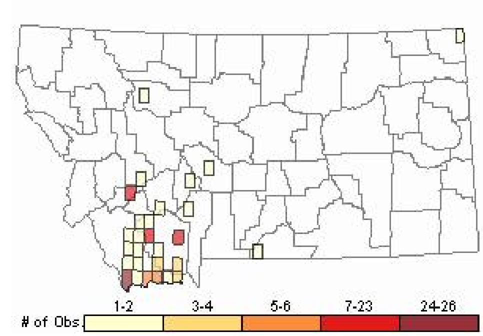
Montana Natural Heritage Program

Mealy Primrose
Primula incana

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 2
C-value: 5



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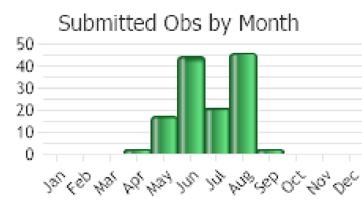


General Description

Mealy Primrose is slender, tall, and heavily farinose, or occasionally efarinose. It rises up to 46 cm high, and leaves are elliptic or oblanceolate, including the petioles, which are up to 6 cm long. Blades are 0.3-1.6 cm wide with denticulate margins and gradually narrow into a broadly winged petiole. The involucral bracts are 0.5-1 cm long, oblong, densely covered with white farina, flat above, and saccate or gibbous at the base. The umbels are capitate, 7-19 flowered, and the pedicels are short and 0.3-0.9 cm long. Flowers are homostylous. The calyx is green, heavily farinose, cylindrical, obscurely ribbed, and 0.4-0.7 cm long; it is divided up to one third its length by lanceolate teeth that are covered with capitate 3-4 celled glands. The corolla is lavendar with a yellow throat. The limb is 0.4-0.8 cm wide, emarginate, and is a tube that is equal to or slightly longer than the calyx. Stamens are ca. 1 mm long and located in the upper portion of the corolla tube. The stigma is capitate and located adjacent to the anthers. The capsule is cylindrical to slightly elliptical, 0.2-0.3 cm wide, and 1.5-2 times the length of the calyx. Seeds are brown, reticulate, ca. 0.2 mm long.

Phenology

Flowering occurs in May to June.

Diagnostic Characteristics

Primula parryi occurs in rocky habitats near or above treeline. The similar *P. alcalina* is found in the same habitat, but it has white flowers, and its leaves have little or no mealy covering, even below. In addition, the anther filaments of *P. alcalina* are of two different lengths.

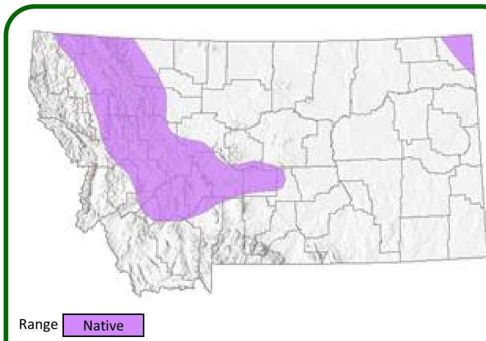
Habitat

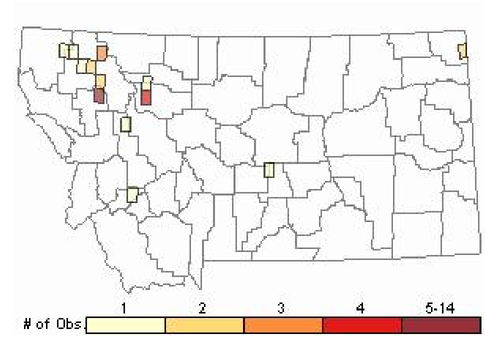
In southwestern and north-central Montana, mealy primrose has been found in saturated, often calcareous wetlands. Dominants or common associates include *Carex simulata, C. nebrascensis, Juncus balticus, Agrostis stolonifera, Muhlenbergia richardsonis, Calamagrostis stricta*, and *Eleocharis pauciflora*. In Sheridan County it was restricted to seep habitat with marl deposits beside an alkali lake. The most common associated species there were *Juncus balticus, Scirpus pungens, Triglochin maritimum*, and *Potentilla anserina*.

Kalm's Lobelia
Lobelia kalmii
View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 5





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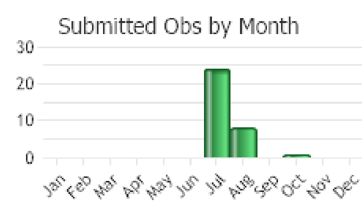


General Description

Stems erect, usually simple, 10–40 cm. Herbage glabrate. Basal leaves petiolate, spatulate, entire to obscurely dentate, 1–3 cm long. Stem leaves becoming linear-lanceolate, 1–4 cm long. Inflorescence of <10 flowers; pedicels bracteate. Flowers: sepals lanceolate, 2–3 mm long; corolla 5–10 mm long, blue, whitish at top of the tube. Capsule obconic, 4–7mm long (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Lobelia is named for the botanist Mathias de L'Obel (Morley 1970). In 1570, Mathias along with Pierre Pena published the first book that arranged plants by leaf characteristics, which represented a major advancement in the study of plant classification (Morley 1970).

Diagnostic Characteristics

Plants slender rarely over 4 dm tall, flowers 7-16 mm long, pedicels with a pair of subopposite bractioles; corolla not normally fenestrate, base of lower lip smooth; capsule ovoid, seeds rough tuberculate.

Habitat

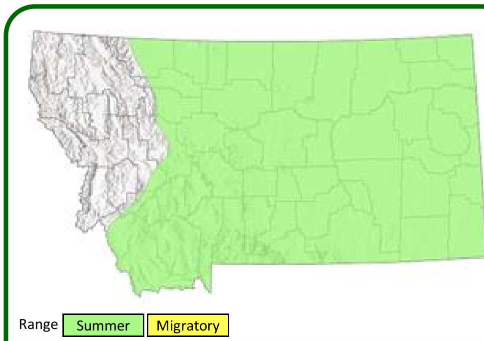
Organic soil of wet meadows, fens; valleys, montane (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

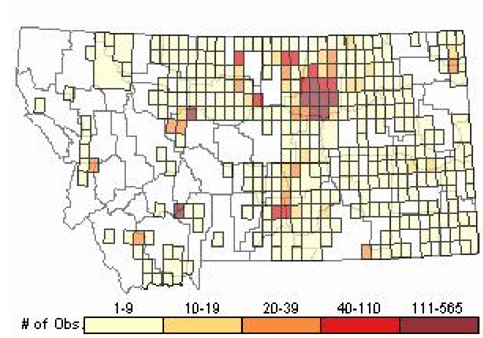
Burrowing Owl
Athene cunicularia

View in Field Guide

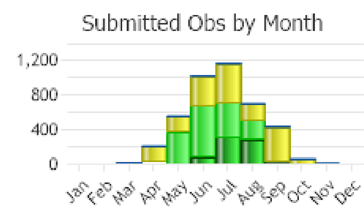
Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA; BCC17
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 1





 # Observations: 4229



General Description

Burrowing Owls are probably most distinguishable because of their ground-dwelling behavior. They may also be identified by their long legs, round, tuft-less head, and bright yellow eyes. The distinct oval facial ruff is framed by a buffy white eyebrow-to-malar stripe near the bill (Haug et al. 1993). The primary feathers of their relatively long, rounded wings are brown with buffy-white barring. Their tail is short and also decorated with this same brown with buffy-white barring. The back, scapulars, and crown are brown with buffy-white spotting (Haug at al. 1993). The underparts are a buffy-white with broad brown barring, while the throat and undertail coverts are white (Haug et al. 1993). The bill is pale, cream colored to yellowish-white or greenish-yellow (Haug et al. 1993). As with other owl species, females may be darker than males, especially in worn plumage. Juveniles are similar to the adults, except the head is plain brown, the upper chest has a dark tan band, and the lower chest and belly are light-to-white in color.

This owl averages 24 cm (9.5 inches) long with a wingspan of 53 cm (21 inches), and a weight of approximately 155 grams (5 onces) (Sibley 2000).

The male call is described as a high nasal trumpeting "*coo-coo",* which may be answered by the female with a short clear "*eeep"* or a harsh rasping "*ksshh"* (Sibley 2000). A rasping alarm call is made by both sexes. Vocalizations heard year round include short, sharp husky "*chuk"* or a series of barking notes, with a rasping scream described as "*kwee-ch-ch-ch-ch"* or "*cheee-twikit-twik"* (Sibley 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Burrowing Owls can be identified from other owl species by the fact that they live in the ground. They are found in open grassland habitat where they nest and roost in abandoned animal burrows. In addition to perching on the lip of their prairie burrows, these owls may be observed on fence posts. They are also active during both the day and night. An owl species common in Montana, which also may be seen on the ground, is the Short-eared Owl. This species, however, is about twice the size of the Burrowing Owl, has dark patches on the wings and at the eyes, short ear tufts, a dark bill, and does not nest is burrows (it nests in a scrape in the ground) (Ehrlich et al. 1988).

Habitat

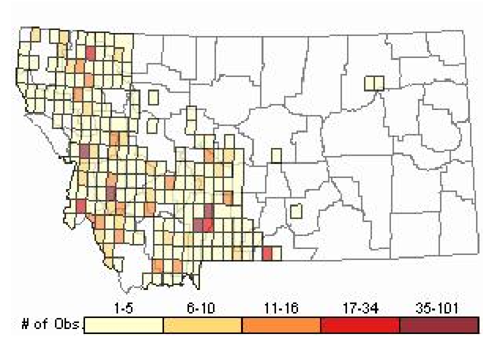
Burrowing Owls are found in open grasslands, where abandoned burrows dug by mammals such as ground squirrels (*Spermophilus* spp.), prairie dogs (*Cynomies* spp.) and Badgers (*Taxidea taxus*) are available. Black-tailed Prairie Dog (*Cynomys ludoviscianus*) and Richardson's Ground Squirrel (*Spermophilus richardsonii*) colonies provide the primary and secondary habitat for Burrowing Owls in the state (Klute et al. 2003). The burrows may be enlarged or modified, making them more suitable. Burrowing Owls spend much time on the ground or on low perches such as fence posts or dirt mounds.

Great Gray Owl
Strix nebulosa

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3, SGIN
PIF: 3



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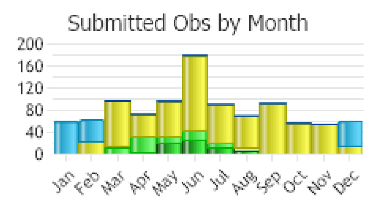


General Description

Great Gray Owls are the largest owl species in North America. They have a wingspan over 4 feet with a body length of up to 27 inches. They can weigh over 2 pounds. Females are usually larger than males, but they are otherwise identical in appearance. Great Gray Owls have a large, rounded, half-domed head with a flat face and no ear tufts (Bull and Duncan 1993, Sibley 2000). Their eyes are yellow, but look rather small due to the ringed facial disks. The bill is mostly yellow with a black patch below separating white lores that give Great Gray Owls their classic bow-tied appearance. The plumage is mostly gray with patches of whites and browns. The tail is fairly long and is also brown and gray (Bull and Duncan 1993).

The vocalization of Great Gray Owls is a series of deep resonating "*whoos*" that falls in pitch and accelerates (Cramp 1985).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Great Gray Owls are distinguished from Barred Owls (*Strix varia*) by their much larger size, yellow eyes, bow-tie under the face, the lack of barring on the breast, and the better defined concentric rings on the face (Bull and Duncan 1993). Great Gray Owls are distinguished from their other closest relative, the Spotted Owl (*Strix occidentalis*), by many of the same physical characteristics, much larger size, yellow eyes, and bow-tie. Also, the ranges of Great Gray Owl and Spotted Owl do not usually overlap, unless extreme southern movements occur by Great Gray Owls in winter.

Habitat

Little specific habitat information for Montana is currently available, as systematic surveys for Great Gray Owls have not been done. Great Gray Owls are known to use lodgepole pine/Douglas-fir in Montana. Habitat information from other Great Gray Owl sources state that their habitat is dense coniferous and hardwood forest, especially pine, spruce, paper birch, poplar, and second-growth, and especially near water. They forage in wet meadows, boreal forests and spruce-tamarack bogs in the far north, and coniferous forest and meadows in mountainous areas.

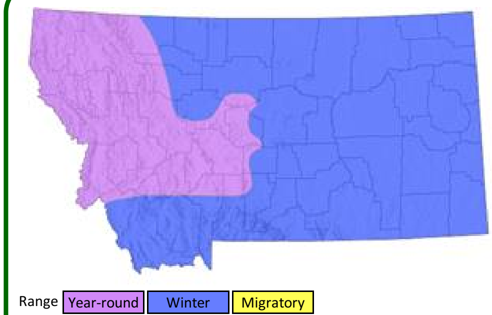
Great Gray Owls nest in the tops of large broken-off tree trunks (especially in the south), in old nests of other large birds (e.g., hawk nest) (especially in the north), or in debris platforms from dwarf mistletoe, frequently near bogs or clearings. Nests are frequently reused (Franklin 1988) and the same pair often nests in the same area in successive years.

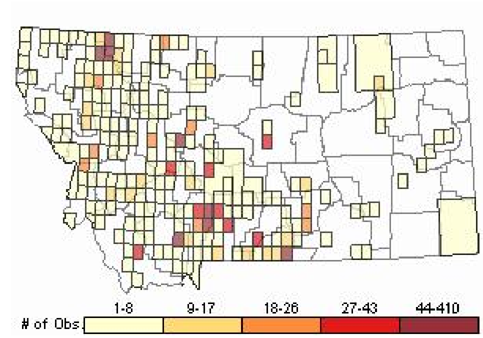
Gray-crowned Rosy-Finch
Leucosticte tephrocotis

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN2, SGIN
PIF:





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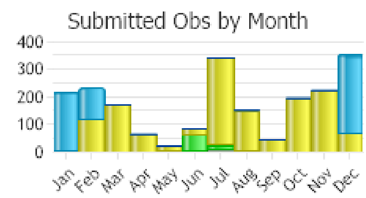


General Description

The Gray-crowned Rosy-Finch is a medium-sized, dark brown finch of about 14 to 16 cm in length and 22 to 26 grams in weight; the Pribilof and Aleutian island forms are larger (17 to 21 cm in length and 42 to 60 grams in weight). Adults are rather stout with long wings and a notched tail. Adult male plumage includes pink on the wings, belly, and rump, a black forecrown and gray band around the hindcrown (in some races gray is also present on the cheeks, and the head appears mostly gray). The breast and flanks are brown, nasal tufts are white, and the bill is yellow in winter and black in the breeding season. The sexes are similar in size and appearance, although in females the black in the crown and the pink in the plumage are less distinct. Juveniles are similar in appearance to adult females but with overall duller coloration and lacking the gray crown, black forehead, and pink on the underparts (MacDougall-Shackleton et al. 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Gray-crowned Rosy-Finch is most likely to be confused with other rosy-finch species. The Black Rosy-Finch is much darker bodied (blackish or blackish-brown) with less extensive pink on the underparts, and lacks the mostly gray head present in one race of Gray-crowned Rosy-Finch that winters in Montana. The Brown-capped Rosy-Finch lacks gray on the head, and the body plumage is a richer brown with darker and more extensive pink on the belly. Ranges of the three species rarely overlap during the breeding season (MacDougall-Shackleton et al. 2000).

Habitat

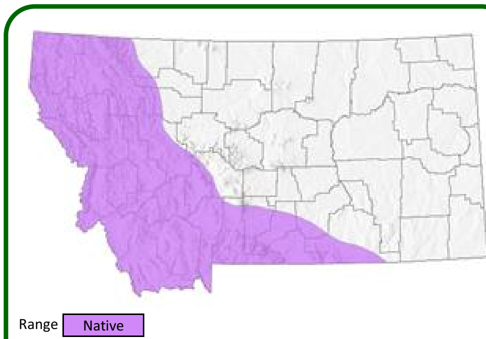
Breeding, nesting, and winter roosting habitat in Montana is similar to other regions in the species' range (Johnson 1965, Hendricks 1981). Gray-crowned Rosy-Finches nest in crevices in cliffs and talus among glaciers and snowfields above timberline (also in abandoned buildings above treeline) and forage in barren, rocky or grassy areas adjacent to the nesting sites; in migration and winter they also occur in open situations, fields, cultivated lands, brushy areas, and around human habitation. They may roost in mine shafts or similar protected sites. During some winters individuals move out onto the shortgrass and midgrass prairies to feed (Hendricks and Swenson 1983, Swenson et al. 1988).

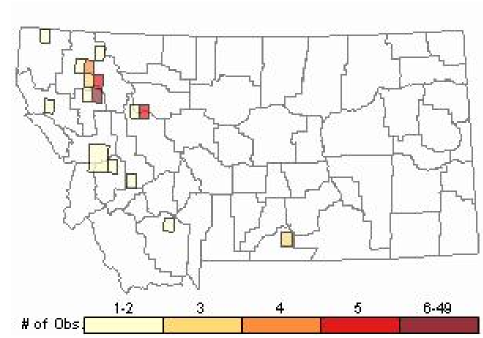
Giant Helleborine
Epipactis gigantea

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S2S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 2
C-value: 8





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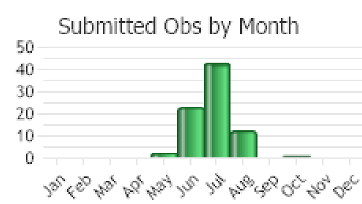


General Description

PLANTS: Perennial herbs with leafy stems that are 30-120 cm tall and which arise from short rhizomes to form colonies. Source: Lesica et al. 2012.

LEAVES: The leaves are cauline, without petioles clasping the stem, and up to 20 cm long. Lower leaves are ovate while the upper are lance-shaped. The herbage is rough to the touch or smooth and glabrous. Source: Lesica et al. 2012.

INFLORESCENCE: A long, narrow, 4-10 flowered, leafy-bracted raceme located at the tops of the stems. Flowers are bilaterally symmetrical with long green sepals and shorter, broader, reddish petals. Source: Lesica et al. 2012.

The specific epithet *gigantea* translates directly to the common name “giant” and refers to the large size of the species when compared to other species in the genus. *Epipactis* is derived from the ancient Greek word *epipaktis* which was the common name for hellebore, a genus in the Ranunculaceae family that bears some similarities to *Epipactis* species (Giblin et al. [eds.] 2018).

Phenology

Range wide, *Epipactis gigantea* flowers anywhere from March through August (Brown et al. 2002). The flowering period of cooler climates may not begin until mid-June (Rocchio et al. 2006).

Diagnostic Characteristics

Montana has two species of *Epipactis*, one native, *E. gigantea*, and one non-native, *E. helleborine*. Both species are perennial herbs with bilaterally symmetrical flowers borne in leafy-bracted terminal racemes.

Giant Helleborine - *Epipactis gigantea*, native, SOC
*Size: Mature plants are 30-120 cm tall.
*Leaves: Lanceolate to elliptic blades that are 6-15 cm long.
*Sepals: Green with obvious brown veins. Lateral sepals are 12-24 mm long.
*Petals: Lateral petals 13-15 mm long, ovate, and pinkish.
*Lip: Lip petal 14-20 mm long, concave, and grooved on the tip (lobed). Petal is orangish-yellow with a saccate portion that is purplish veined.
*Fruit: An ovoid to ellipsoid capsule, glabrate, that is 2-3 cm long.

Eastern Helleborine - *Epipactis helleborine*, exotic
*Size: Mature plants are 20-100 cm tall.
*Leaves: Lanceolate to ovate blades that are 6-10 cm long.
*Sepals: Green with no or very faint brown veins. Lateral sepals are 6-13 mm long.

*Petals: Lateral petals 8-11 mm long, ovate, and pinkish.
*Lip: Lip petal 9-12 mm long, pouch-like, and not grooved on the tip (not lobed). Petal is purplish-green with saccate portion that is purplish and indistinctly veined.
*Fruit: An ellipsoid capsule that is 9-14 mm long.

Habitat

Giant Helleborine prefers saturated, calcareous soil of often warm seeps and springs where the ground doesn't freeze hard, in valleys (Lesica et al. 2012).

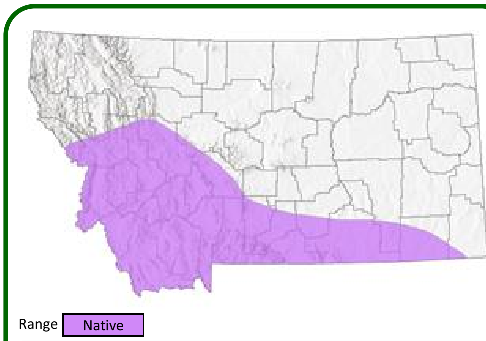
Preferred habitat includes hot springs and lake shores (Mehrhoff 1978).

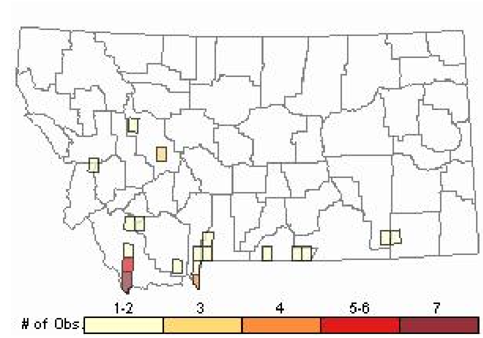
Suksdorf Monkeyflower
Mimulus suksdorfii

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G4
State Rank: S3S4

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 4





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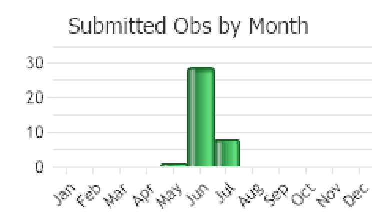


General Description

Annual. Stems erect, usually branched, 2–10 cm. Herbage glabrate to glandular-puberulent. Leaves sessile, linear-lanceolate, serrate, 5–15 mm long. Flowers: calyx purplish, 3–5 mm long, ca. as long as the pedicel, teeth equal, up to 0.5 mm long; corolla yellow, 4–6 mm long, obscurely bilabiate, lobes subequal. Capsule 4–5 mm long (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Diagnostic Characteristics

Montana has 14 native *Mimulus* species (Lesica et al. 2012). The following species share characteristics of being short annuals, often less than 15 cm tall, with yellow flowers.

Short-flowered Monkeyflower-*Mimulus suksdorfii*
*Hairs: Stems and calyx glabrate to glandular-puberulent. Hairs are single-celled (not septate).
*Leaves: Sessile. Blades are narrowly elliptic, entire, and 5-10 mm long.
*Flower Stems: Calyx about as long as the pedicel.
*Corolla: 5-8 mm long, yellow, and slightly bilabiate with subequal lobes.
*Calyx: Purplish, 3-5 mm long. Teeth about equal, 0.5 mm or less long.
*Habitat: In drier habitats than most Monkeyflowers.

Floriferous Monkeyflower-*Mimulus floribundus*
*Hairs: Stems and calyx with glandular-villous, usually multi-cellular (septate), but occasionally unicellular hairs.
*Leaves: Petiolate, mostly shorter than the leaf blades. Blades are ovate, not noticeably dentate, and 4-12 mm long.
*Flower Stem: In fruit the pedicel ascends or is curved, and is not pressed against the substrate.
*Corolla: 7-11 mm long, yellow, bilabiate with a larger lower lobe and a red-spotted palate.
*Calyx: 4-7 mm long. Teeth equal, 1 mm or less long.

Stalk-leaved Monkeyflower-*Mimulus ampliatus*
*Hairs: Stems and calyx glabrate to glandular pubescent. Hairs are single-celled (not septate).
*Leaves: Petiolate. Blades are ovate, dentate, 2-10 mm long.
*Flower Stem: Pedicel is 2-3 times as long as the calyx.
*Corolla: 10-15 mm long, yellow, flares open, strongly bilabiate, and lower lip is longest.
*Calyx: Purplish, 4-8 mm long. Teeth (or lobes) equal, about 0.5 mm long.

Short-flowered Monkeyflower-*Mimulus breviflorus*
*Hairs: Stems and calyx with glandular-puberulent. Hairs are single-celled (not septate).
*Leaves: Petiolate, usually longer than the calyx. Blades are narrowly elliptic, entire, and 5-10 mm long.
*Flower Stem: Pedicel is 1-3 times as long as the calyx.
*Corolla: 5-8 mm long, yellow, and slightly bilabiate with subequal lobes.

*Calyx: 3-5 mm long. Teeth about equal, 1 mm or less long.

Thinsepal Monkeyflower-*Mimulus hymenophyllus*
*Stems are generally more prostrate and at the basal nodes are sharply bent.
*Hairs: Stems and calyx with sparsely glandular-pubescent. Hairs are single-celled (not septate).
*Leaves: Long-petiolate. Petiole is mostly longer than the blade. Blades are ovate, dentate, and 4-12 mm long.
*Flower Stem: Pedicel of flower is 3-4 times longer than the calyx. In fruit the pedicel bends to form about a 90-degree angle with stem and is generally pressed against the substrate.
*Corolla: 7-20 mm long, yellow, and nearly regular.
*Calyx: 3-5 mmm long. Teeth about equal with rounded to ovate tips. About 1 mm long.

Common Large Monkeyflower-*Mimulus guttatus*
*Plants found in temporarily moist areas, may grow as short annuals while those in permanently moist areas tend to be taller perennials; Sometimes plants become stoloniferous (Lesica et al. 2012).
*Hairs: Stems and calyx glabrate to glandular-puberulent. Hairs are single-celled (not septate).
*Leaves: Petiole is short. Blades are ovate, serrate, and 0.5-9 cm long.
*Corolla: 15-40 mm long, yellow with red-spots, and strongly bilabiate with spreading lips.
*Calyx: 6-14 mm long. Teeth (or lobes) acute, 0.5-3 mm long, and unequal; the upper calyx lobe is largest.

Habitat

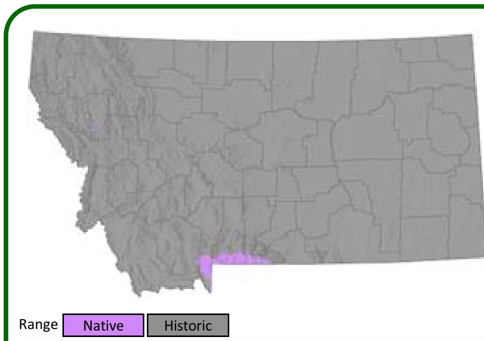
Vernally moist soil of grasslands and rocky slopes in the foothills and montane zones.

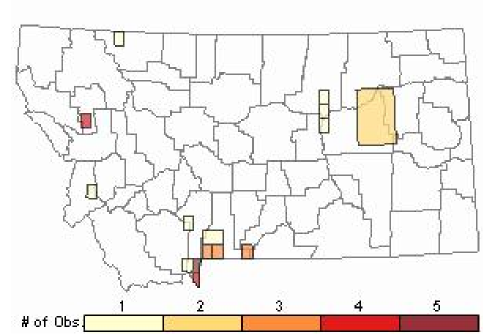
Bison
Bos bison

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
FWP SWAP: SGCN2





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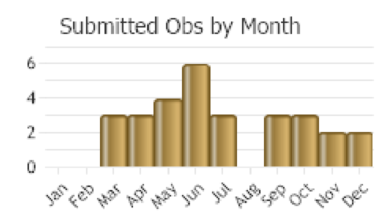


General Description

Bison are the largest North American land animals with weights over 1000 kilograms recorded (Foresman 2012). They have a massive dark head with short black horns curving upward and inward from the base. A large mop of long dark hair covers the top of the head. The body is tall and narrow (1.8 meters at the shoulder) (Foresman 2012), with a distinctive large shoulder hump tapering toward the hindquarters. The tail is short and tufted at the end. The legs are relatively short. Adult Bison have heavy light brown hair covering their shoulders and forequarters blending to shorter darker hair from their shoulders back. The head, neck and front legs have dark hair as well. In summer, much of the hair on the hindquarters is lost. Male bison are proportionally larger and more robust than females. Calves are reddish in color but darken to adult pelage by their first fall.

Diagnostic Characteristics

Bison are unmistakable. The combination of large size, shoulder hump, and short, dark, curved horns on both sexes eliminates any other large ungulate.

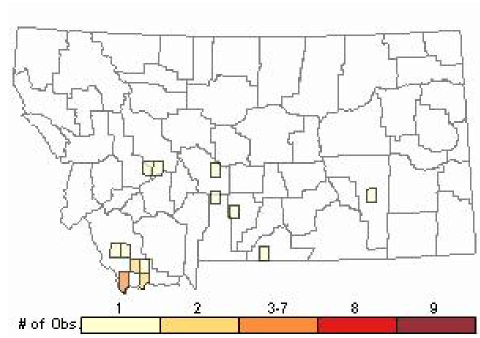
Habitat

Because of restrictions, currently occupied habitat does not reflect the full natural range for Bison. Habitat consists of Palouse prairie and montane forest on the National Bison Range; the Yellowstone Park range is unavoidably at higher elevations with grassland interspersed with forest. Throughout their range, Bison inhabit open plains and grasslands. Woodlands and openings in boreal forest, meadows, and river valleys are used in the northern parts of their range. Like other large grazers, they are attracted to burned areas the next growing season (Shaw and Carter 1990). During the growing season at the Konza Prairie in northeastern Kansas, they preferred areas that had been burned in spring. Summer grazing was concentrated in large watershed area (79 to 119 hectares) dominated by warm-season, perennial C4 grasses. In fall and winter, they grazed both burned and unburned watersheds more uniformly, but grazed most intensively in areas with large stands of cool-season, C3 grasses (Vinton et al. 1993).

Mat Buckwheat
Eriogonum caespitosum

Species of Concern
Native Species
Global Rank: G5
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value:



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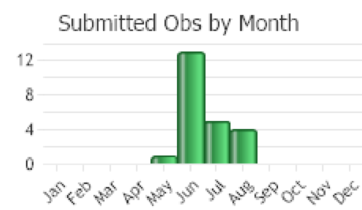


General Description

Mat Buckwheat is a low, perennial herb or subshrub that forms cushions up to 5 cm high. The alternate, oblong leaves are 10-15 mm long, including the petiole, have entire, downturned margins, and persist on the stem after withering. The foliage is covered with long, gray hairs. The numerous flowers are borne in crowded, globose inflorescences atop leafless stalks that are 3-8 cm high. Flowers arise from a solitary, cup-shaped involucre with 6-7 reflexed lobes. Each flower has 6 yellow and rose, petal-like perianth segment that are 3-5 mm long. The perianth segments are united below and taper to a hairy woolly base.

Phenology

Flowering in June.

Diagnostic Characteristics

The tapered, stalk-like perianth and the solitary involucre distinguish this species from other mat-forming *Erigonum*.

Habitat

Dry, stony limestone sagebrush steppe.

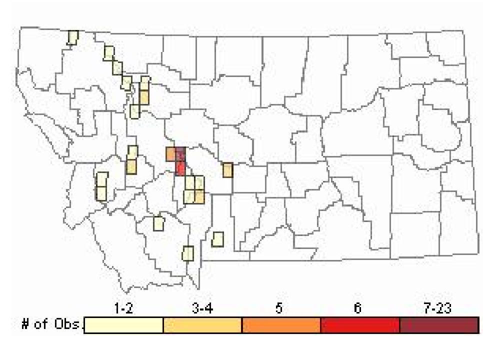
Austin's Knotweed

Polygonum austiniae

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5T4
State Rank: S3S4

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 2
C-value: 6



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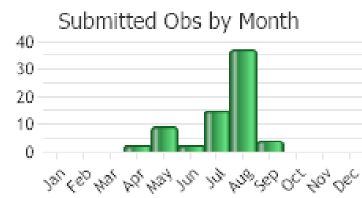


General Description

Austin's Knotweed is a sparsely hairy annual with erect stems that are 3-10 cm high and branched near their bases. The alternate, narrowly egg-shaped to elliptic leaves are 5-15 mm long and 1/2-1/3 as wide. The lower leaves have short petioles, while the upper leaves are sessile and smaller. There are small membranous sheaths, or stipules, surrounding the stem at the point of leaf attachment. Groups of 1-4 tiny, nodding flowers occur in the axils of all but the lowest leaves. Each flower has 5-8 stamens and 5 petal-like tepals that are 2-3 mm long and green with white or pink margins. The shiny black achenes are 3-sided and mostly 2-2.5 mm long.

Phenology

Generally flowering in July and fruiting in August.

Diagnostic Characteristics

There are many similar-appearing annual species of *Polygonum*. The typical P. *douglasii* subsp. *douglasii* has leaves that are less than 1/3 as wide as they are long and achenes that are about 3 mm long. Many other species of *Polygonum* have erect flowers. A technical key and hand lens may be required for positive determination.

Habitat

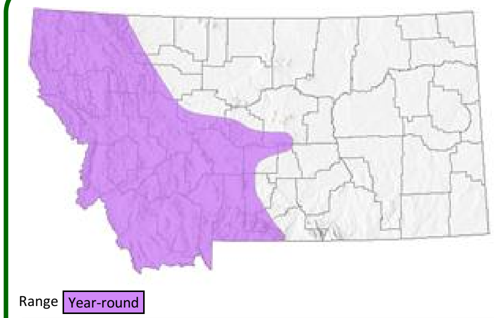
Gravelly, often shale-derived soil of open slopes and banks in the montane zone.

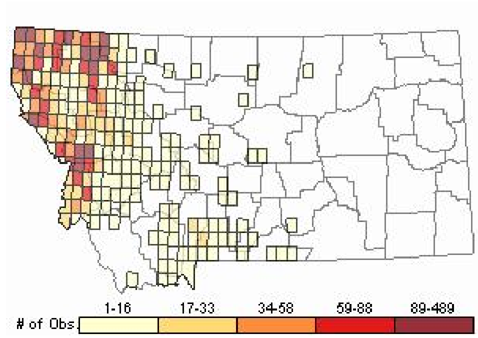
Pacific Wren
Troglodytes pacificus

View in Field Guide

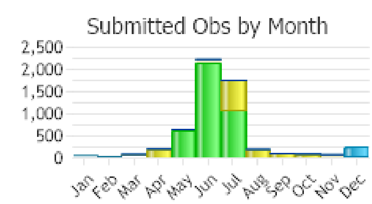
Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 2





 # Observations: 5646



General Description

The Pacific Wren is a small dark wren (8-12 cm long, 8-12 g) with a short stubby tail typically held in an upright and cocked position, and with a short slender bill. The color is fairly uniform dark to medium brown, becoming paler on the supercilium, chin, and throat, and with dark barring on the wings, tail and underparts (belly, flanks, crissum); sexes are alike in appearance.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Pacific Wren was formerly considered a subspecies of Winter Wren (*T. troglodytes*), then split in 2010 based on voice, DNA, and subtle differences in plumage (more deeply rufescent). Pacific Wrens are distinguished from other sympatric wrens by usually smaller size, much shorter tail, and fairly uniform brown coloration. Their voice is more complex and modulated, and delivered more rapidly than by the Winter Wren, such that individual notes are difficult to follow and appreciate (Hejl et al. 2002). Winter Wren reported infrequently during migration in far eastern Montana.

Habitat

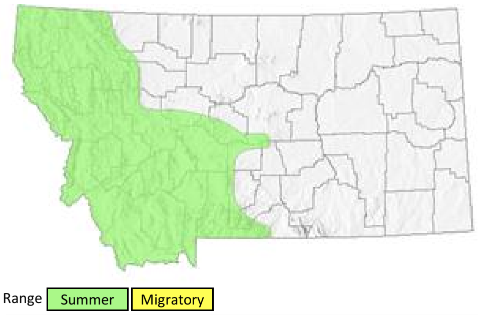
Pacific Wrens prefer large uncut stands of old-growth and mature coniferous forests and also occur in riparian cottonwoods and aspens. In Montana they are especially common in cedar-hemlock, cedar-grand fir, and spruce-fir forests and are strongly associated with riparian areas within these forest types (Manuwal 1986, Hutto and Young 1999, Casey 2000). Snags, large trees, and downed woody debris are important components of breeding habitat. The nest substrate is highly variable and includes woodpecker cavities in trees, holes in dirt banks, niches in rotting trees, root tangles of fallen trees, clumps of hanging moss, and folds in tree bark (Hejl et al. 2002). Nesting and foraging typically occur within 2 m (6.5 feet) of the ground. In winter, Pacific Wrens use thickets in open forests and lower-elevation riparian areas in addition to large tracts of mature forests.

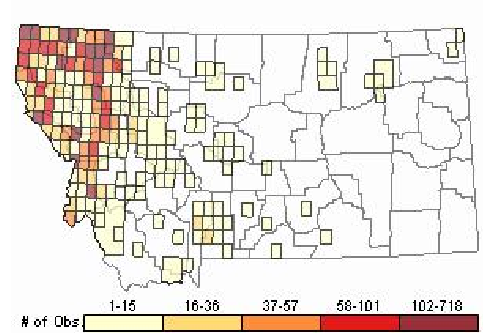
Varied Thrush
Ixoreus naevius

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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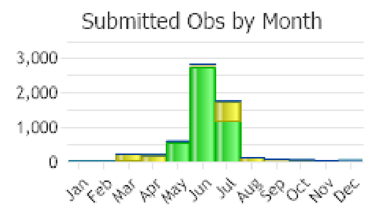


General Description

The Varied Thrush is unmistakable with its black and orange plumage and ethereal song. Yet, its shy behavior and tendency to nest in dense mature and old-growth forests have made study of this the breeding biology of this species difficult.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

In Montana, active Varied Thrush nests have been observed beginning mid- to late-April. Nestlings and fledglings have been observed as early as mid-May. Fledglings from likely second broods observed mid- to late-August (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

The Varied Thrush is a large, brightly colored thrush. Adult male has a burnt-orange breast and throat, gray to gray-blue rump, back, neck, and crown, a black to slate-gray V-shaped breast band, orange-buffy eyebrow and wing bars, and black to slate-gray wing and tail feathers. Female is similar to male but duller overall with brown-olive to brown-gray upperparts, brown wing and tail feathers, and brown to slate-gray breast band. Plumages are similar throughout the year. Immature birds are similar to adults except the head and neck are brown tinged with buff with an indistinct orange eyebrow. Throat and breast feathers are buff instead of orange. The song of this species is distinctive: a long, whistled tone about two seconds in length with a pause of three to 20 seconds between each tone. The song is somewhat ventriloquial. (George 2000).

Habitat

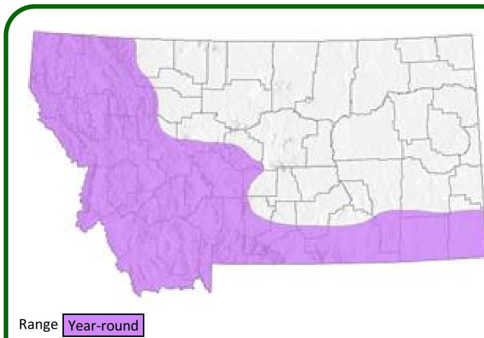
In Montana, the Varied Thrush breeds in mixed-coniferous forests with most observations occurring in western and northwestern Montana (Montana Natural Heritage Program Point Observation Database 2014). Dominant tree species include Douglas-fir and western larch. This species is more abundant in mature and old-growth forest stands than in younger forests (Tobalske et al. 1991). In winter, the Varied Thrush uses a wider variety of habitats, including suburban areas such as bird feeders and areas where fruits and berries are present (George 2000).

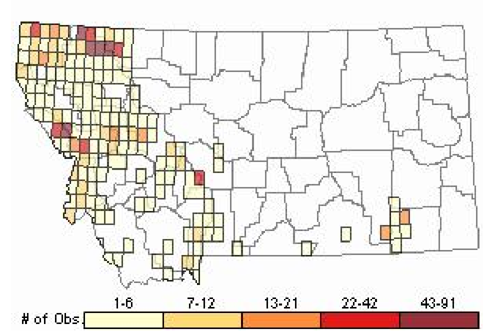
Black-backed Woodpecker
Picoides arcticus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 1





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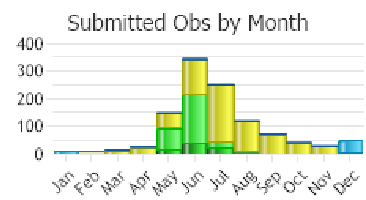


General Description

Black-backed Woodpeckers are at the large end of the medium-sized woodpeckers. At 9.5 inches in length, only the flickers and Pileated Woodpeckers (*Dryocopus pileatus*) are larger. Adults are similar in size and in appearance except for the yellow crown present only on the males. The back of the head, neck, back, and wings (upperparts) are all black and the chin, throat, breast and belly (underparts) are white. The sides and flanks are also white with heavy black barring. A strong white line runs below the eye from the bill to the nape (Dixon and Saab 2000). The wing primaries are barred black and white and only the outer tail feathers (rectrices) are white; otherwise the tail is black. Juvenile birds are similar in appearance but much duller overall. They have a plain black crown, with no, or nearly no, crown patch, and a washed out or buffy look to the underparts. Black-backed Woodpeckers, like Three-toed Woodpeckers (*Picoides tridactylus*), have only 3 toes on each foot rather than the normal 4 toes (Dixon and Saab 2000).

The call note, a single metallic *"kyik"* or *"chet"* (similar to Hairy Woodpecker, *Picoides villosus*) helps to detect the Black-backed Woodpecker. They also use a unique agonistic *"wet-et-ddd-eee-yaaa*," or *"scream-rattle-snarl"* call in association with a hunched wing-spreading display (Short 1974). Drumming is variable (fast or slow) in long, even rolls (Farrand 1983, Goggans 1989). Drumming is described as coming in 2-second bursts tapering off at the end, at intervals of 30 to 40 seconds, suggestive of Pileated Woodpeckers. They also give single raps when nervous or about to roost (Kilham 1966).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Having only three toes on each foot and, in males, having a yellow crown patch instead of red, distinguishes Black-backed Woodpeckers from all other woodpeckers except Three-toed Woodpeckers (Dixon and Saab 2000). The all-black head and back are diagnostic of Black-backed Woodpeckers. Three-toed Woodpeckers have at least some white on the back. Also, the white line under the eye is broader in Black-backed Woodpeckers; Three-toed Woodpeckers have a slimmer white line below the eye as well as another white line behind the eye. The yellow crown patch is smaller and solidly yellow in Black-backed Woodpeckers rather than larger and rather streaked in Three-toed Woodpeckers. Female Black-backed Woodpeckers have a solid black forehead and crown, which is unlike the streaked and white speckled forehead and crown of Three-toed Woodpeckers (Dixon and Saab 2000).

Habitat

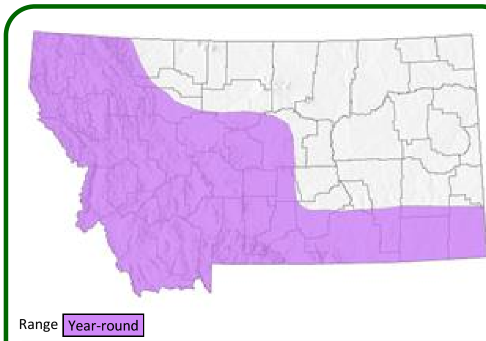
The habitat of Black-backed Woodpeckers in Montana is early successional, burned forest of mixed conifer, lodgepole pine, Douglas-fir, and spruce-fir (Hutto 1995a, 1995b), although they are more numerous in lower elevation Douglas-fir and pine forest habitats than in higher elevation subalpine spruce forest habitats (Bock and Bock 1974). This is supported by Harris (1982) who found Black-backed Woodpeckers in two recently burned forests comprised of 73% and 77% Douglas-fir, respectively. They appear to concentrate in recently burned forests and remain for several years (3 to 5) before leaving due to prey source decline (Harris 1982). In northwestern Montana, Black-backed Woodpeckers nested in areas of western larch (*Larix occidentalis*)/Douglas-fir forest with a major component of old-growth (McClelland et al. 1979). Harris (1982) found Black-backed Woodpeckers nesting within western larch even though the stand was predominately Douglas-fir. McClelland et al. (1979) determined the decay of heartwood while maintaining a hard outer shell of western larch creates an ideal nesting site for Black-backed Woodpeckers to excavate.

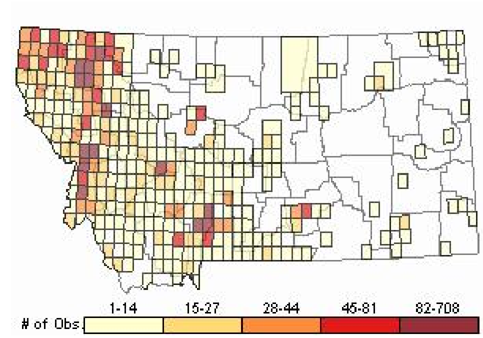
Brown Creeper
Certhia americana

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 1





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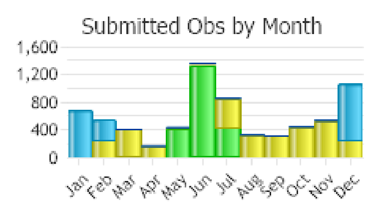


General Description

The Brown Creeper is the only tree creeper in North America. It is very small: males 12.0 to 13.5 cm (4.7 to 5.3 inches) total length; females 11.7 to 13.2 cm (4.6 to 5.2 inches) total length. Average body mass for both is 7.2 to 9.9 g. Adult plumage is dark-brown on the upperparts, extensively streaked with dull whitish on head, back, scapulars, and wings; it has a distinctive brownish-white supercilium. Underparts whitish washed with cinnamon distally. The bill is slightly decurved, the tail long and stiff (Hejl et al. 2002).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The combination of brown and white coloration, very small size, and tree-creeping behavior distinguish this species from all other North American birds.

Habitat

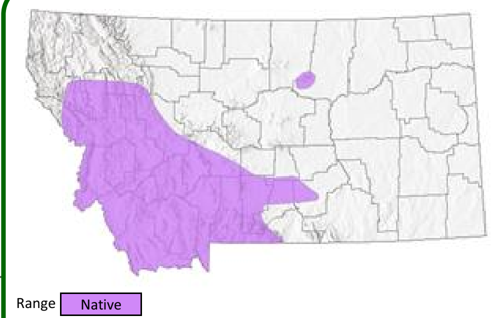
Creepers breed in coniferous and mixed coniferous-deciduous forests, preferring mature and old-growth stands with high canopy cover in the western U.S. (Hejl et al. 2002). Hutto and Young (1999) found that they were more common in mature western redcedar-western hemlock, spruce-fir, and mixed-conifer forests than in pine or younger forests in western Montana and Idaho. They winter in the same habitats used for breeding but also use a wider diversity of forest types, including uplands dominated by deciduous trees, urban and suburban parks and residential areas that contain large trees, and riparian cottonwoods. The consistent factor appears to be the need for large trees and snags (dead trees) for foraging and nesting microsites. Brown Creepers are the only North American birds that build their nests behind loose pieces of bark on tree trunks. They prefer to nest in large dead or dying trees within dense forest stands, placing their nests from <1 m to >20 m above the ground (Hejl et al. 2002). For 19 nests in mixed conifer forests of western Montana and east-central Idaho, 5 were in subalpine fir, 5 in Douglas-fir, 4 in Engelmann spruce, 3 in lodgepole pine, and 2 in western larch; all nest trees were dead and all but one in unlogged forest stands (Hejl et al. 2002).

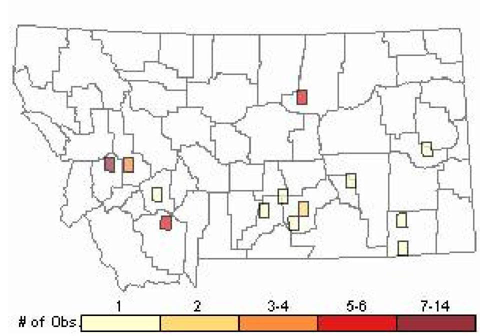
Paiute Dancer
Argia alberta

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G4
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:





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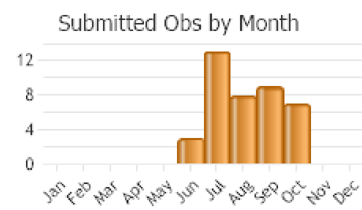


General Description

The small size (hindwing 16-20 mm, length of abdomen 22mm), predominantly dark coloration of the abdominal segments, and elongate, linear cerci distinguish this species from any other in the U.S. (Garrison, 1994; Kennedy, 1918).

Male -- Color: Labrum pale blue, the remainder of the face and head blue with an olive or, in some dried material, a violet cast. Under surface of head yellowish gray with a small black spot on each side of the occipital foramen. Clypeus edged with black. A wide bar through the paired ocelli and a broad, black stripe behind each postoccular area. Eyes dark blue, paler below. Prothorax black dorsally with a bluish spot on each side. Mesothoroax and metathorax dull blue (violet or brown in dried material) darker and duller on the dorsal surface and grayish on the sides. Middorsal stripe occupying one-third of the area between the humeral sutures. Humeral stripe half as wide as the mid-dorsal, it's upper third forked. A black line on the second lateral suture 1mm. wide. Pterostigmata brown subtended by one cell. Legs pale with blue on base of femora, broadly marked with black on the dorsal and anterior surfaces of the tibiae. Tarsi black. Abdomen with seg. 1-3 dull blue becoming duller or brownish on the lower sides. Seg. 1 with a baso-dorsal black spot. Seg. 2 with a narrow apical band and a lateral stripe black. Segs. 4-7 with the apical third and the dorsum black except a narrow basal band blue, the sides bluish or brownish. Segs 8-10 pure, pale blue, the lower edges more or less blotched with black. Superior appendages twice as long as wide when viewed from above, slender in profile. A prominent, internal, apical hook directed ventrad. Inferior appendages bifid, the lower ramus round or bluntly triangular directed caudad, superior lobe directed dorsad and terminating in an acute point.

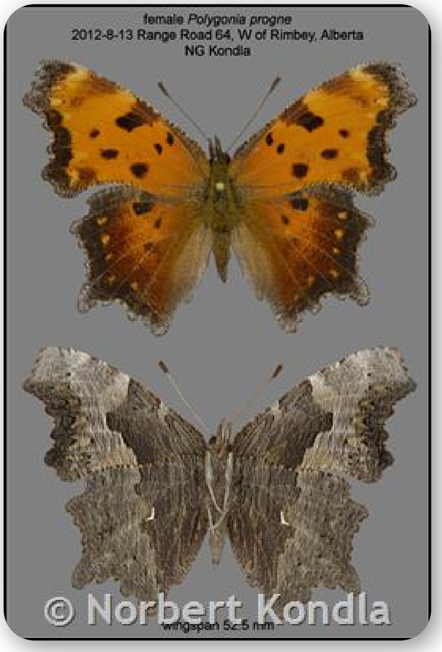
Female.-- Color as in male but with the blue of the head and thorax paler. Eyes gray bluish above. Humeral stripe but half as wide as in the male, it's branches linear. Legs marked as in male but the black on the femora reduced somewhat. Abdomen brown with a narrow apical band on Segs. 2-6. Segs. 2-6 with an apical dorsal spot, a lateral stripe and an oblique spot on the lower apical angle of the side. Segs. 8-9 with dorsolateral stripe. Seg. 10 pale. In some females Seg. 6 is colored like 7. Mesostigmal laminae with no special modifications (Kennedy, 1918).

Habitat

Paiute Dancers are associated with warm or hot-springs, as well as spring-fed marshes and sandy streams that flow from the springs. Vegetation is abundant and mostly sedges (Westfall and May 1996; Paulson 2009).

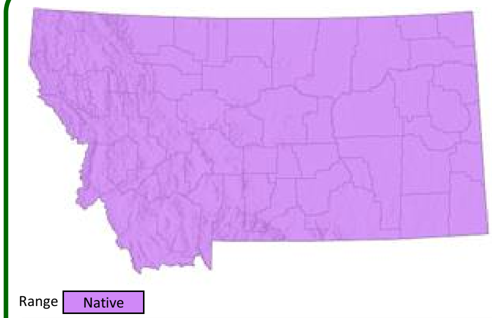
Gray Comma
Polygonia progne

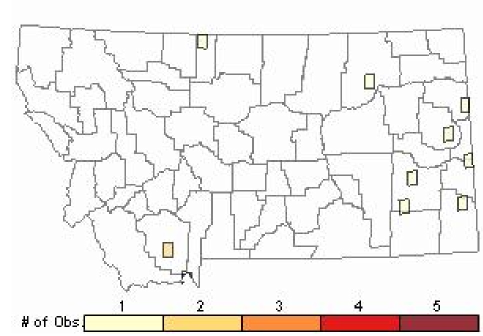
View in Field Guide



Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:





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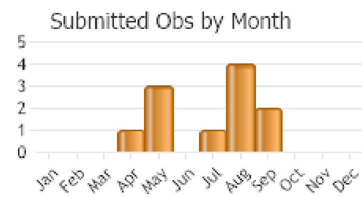


General Description

[From Ferris and Brown 1981; Scott 1986; Opler and Wright 1999; Glassberg 2001; Guppy and Shepard 2001] Forewing 2.3-2.6 cm. Upperside bright orange-brown with a wide dark border; winter form (from 2nd flight) has a border covering only about 1/4 of the wing, both enclosing a few small yellow spots; underside charcoal gray and heavily striated, outer portion of forewing whitish with 3-4 light chevrons in a dark border, silver mark in center of hindwing is small, slender, L-shaped, tapered at both ends.

Phenology

One flight, mainly June and July north of southern Canada; two flights, late June to early July then August to early September elsewhere (Scott 1986; Glassberg 2001; Guppy and Shepard 2001).

Diagnostic Characteristics

Determined by a combination of upper hindwing black border wide with small yellow spots, underwing surfaces charcoal gray and heavily striated, silver-white "comma" on the under hindwing tapered at both ends.

Habitat

Deciduous woodlands, riparian woodlands, forest openings, aspen parkland (Opler and Wright 1999; Glassberg 2001; Guppy and Shepard 2001). Habitat in Montana not described.

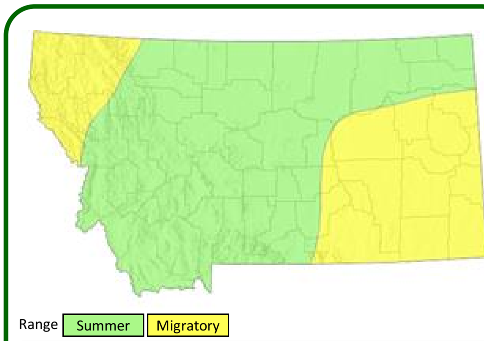
Black-crowned Night-Heron

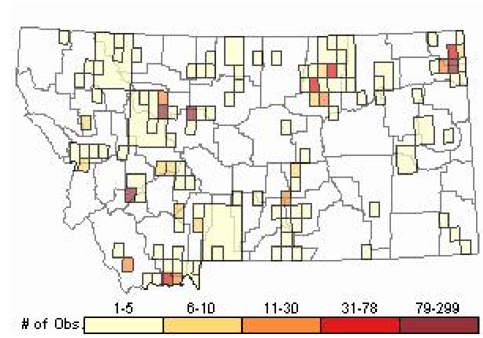
Nycticorax nycticorax

View in Field Guide

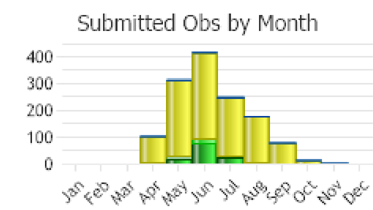
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





 # Observations: 1378



General Description

The Black-crowned Night-Heron is a medium sized wading bird (length 58 to 66 cm) of stocky build, with a relatively large head, and fairly short neck and legs. Males and females are similar in plumage, with the males of slightly larger size. The adults are dominated by gray plumage, complete with black crown, black bill, and yellow to yellow-green legs. The eye, which start out as a grayish-olive at hatching, quickly turn to light yellow, bright yellow, orange, and finally to bright red by 2 to 3 years of age (Davis 1993). During the breeding season, adults also have long white occipital plumes (average of 2 to 3) extending from the distinctly black crown (Davis 1993, Sibley 2000). Juveniles have broad streaks of light brown-over-white on the breast and the wing coverts are covered in large, white spots. They lack the gray, black, and white plumage distinctive in the adults (Sibley 2000).

The common call of the Black-crowned Night-Heron includes a "*Qua, Quak, Quark*" or "*Squawk*," on the part of adults. An advertising call, identified as a hissing "*Plup*", is given from the nest, while the common call is given in flight or while perching (Davis 1993). The vocalization of the young varies as the birds age, from newly hatched to grown young, from a "*Pip, Pip, Pip*" to a "*Chuck, Chuck-a-chuck, Chuck, Chuck*" (Davis 1993).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The distinctive black crown and back, in addition to the gray body and yellow legs, make it hard to confuse this species with any other found in the state. The species to which it is most similar in appearance is the Yellow-crowned Night-Heron (*Nyctanassa violacea*), but this species lacks a black back, has a bold head pattern with a white cheek patch, and is very rare in Montana, having been recorded on only three occasions (Montana Bird Distribution Committee 2012). Young Black-crowned Night-Herons may sometimes be confused with American Bittern (*Botaurus lentiginosus*), but the American Bittern has a long, conspicuous mark on the side of the neck, bold stripes on the breast, dark flight feathers compared to the rest of the back, and lacks the large, pale spots on the underparts (Davis 1993, Sibley 2000).

Habitat

Although highly adaptable to a variety of habitats, the Black-crowed Night-Heron is likely to use shallow bulrush (*Scirpus* spp.) or cattail (*Typha* spp.) marshes, most often within a grassland landscape (Johnsgard 1992). In addition, they will also nest in cottonwoods, willows, or other wetland vegetation that allows them to nest over water or on islands that may afford them protection from mammalian predators (Davis 1993, Casey 2000). Most colonies are located in large wetland complexes, typically with a one-to-one ratio of open water and emergent vegetation (Davis 1993).

In general, Black-crowned Night-Herons are found in marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons, in salt water, brackish, and freshwater areas. Foraging habitat is typically in the shallow, vegetated edges of these ponds, lakes, creeks, and marshes. This heron roosts by day in mangroves or swampy woodland. Eggs are laid in a platform nest in groves of trees near coastal marshes or on marine islands, swamps, marsh vegetation, clumps of grass on dry ground, orchards, and in many other locations. Nesting usually occurs in the same locality with other heron species.

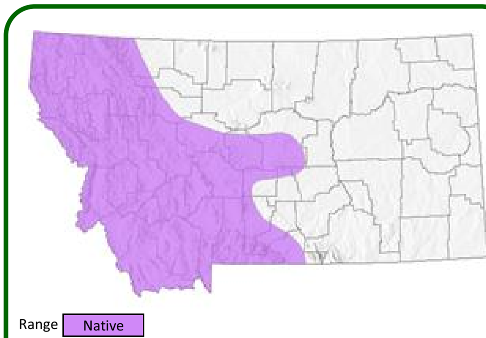
Gillette's Checkerspot

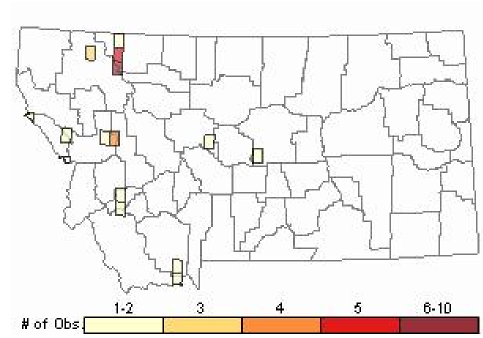
Euphydryas gillettii

[View in Field Guide]

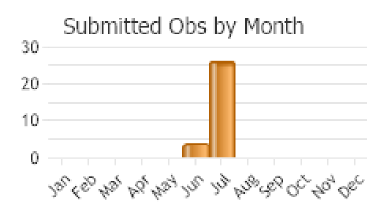
Species of Concern
Native Species
Global Rank: G3
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 35



General Description

[From Ferris and Brown 1981; Scott 1986; Glassberg 2001; Pyle 2002] Forewing 2.0-2.5 cm. Upperwings predominantly black on the basal 2/3, with red and white spot-bands, a distinctive orange-red submarginal band across the predominately dark-brown to black wings; underwings with alternating bands of cream and bright brick-red with black veins and borders of spot-bands.

Phenology

One flight; mostly late June to July (late July to mid-August for subalpine sites), with a short flight season (Scott 1986; Glassberg 2001); mid-June to late July in British Columbia (Guppy and Shepard 2001); June to mid-August (Williams et al. 1984).

Diagnostic Characteristics

The orange-red submarginal band across the predominately dark-brown to black forewings and hindwings is distinctive.

Habitat

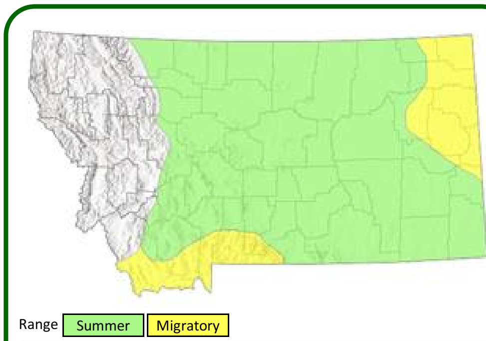
Montane areas in wet meadows, marshy sites, along small streams, open riparian habitat; tree canopy predominantly lodgepole pine, Engelmann spruce, subalpine fir, sometimes with willow, cottonwood, aspen, often in fire-disturbed locations (Williams et al. 1984; Scott 1986; Williams 1988, 1995; Guppy and Shepard 2001). Habitat in Montana as described above (Williams 1988); in Glacier National Park, reported in montane mesic meadows and woodlands (Debinski 1993).

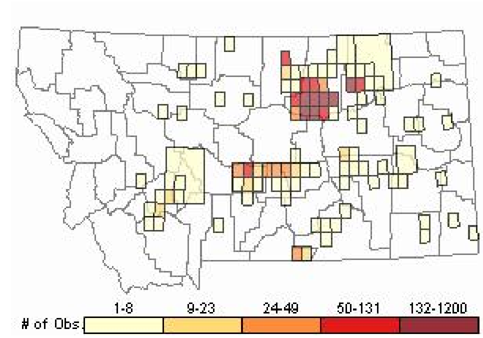
Mountain Plover
Charadrius montanus

View in Field Guide

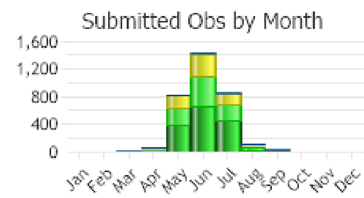
Species of Concern
Native Species
Global Rank: G3
State Rank: S2B

Agency Status
USFWS: MBTA; BCC10; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN2
PIF: 1





 # Observations: 4099



General Description

The upperparts of the Mountain Plover are generally uniformly brown. This color extends along the sides of the neck and onto the chest. The breast band present in many other plovers is absent in this species; the forehead, throat, and breast are white, while the underwings are bright white (Knopf 1996). The dorsal tip of the tail has a broad, black band, or patch, and the outer dorsal surface of the wings is also black (Knopf 1996, Sibley 2000). This plover is fairly large, 21.0 to 23.5 cm in length and weighing from 90 to 110 grams (Knopf 1996). During breeding, a distinctive black line, or loral stripe, is evident from the bill to the eye. Also at this time, the forecrown will be darkly mottled to black (Knopf 1996). An additional field mark identifying this species is a thin white line on the black-colored wing tip (thin white line in primaries) evident in flight (Knopf 1996). The bill of the Mountain Plover is black; the iris auburn; the legs are a dull, light brown-yellow; the feet are dark brown; and the claws are black (Knopf 1996).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The combination of a black forecrown and white breast is a unique color pattern among North American plover species that distinguishes the Mountain Plover (Knopf 1996). The Snowy Plover (*Charadrius alexandrinus*), Semipalmated Plover (*Charadrius semipalmatus*), Piping Plover (*Charadrius melodus*), and a few other plovers, also have black forecrowns, but their breasts are decorated with a black breast band or black side patches (Sibley 2000). Their habitats are also distinctly different (see Habitat).

Habitat

Habitat use in Montana appears similar to other areas within the breeding range; use of prairie dog colonies and other shortgrass prairie sites are confirmed as preferred breeding habitat. Records indicate the species utilizes towns of both White-tailed (*Cynomys leucurus*) and Black-tailed Prairie Dogs (*Cynomys ludoviscianus*) (Montana Bird Distribution Committee 2012). These towns provide greater horizontal visibility, a higher percentage of bare ground, more burrows for refugia, and higher diversity of forbs than adjacent areas (Olson 1985). Mountain Plovers will use towns as small as 3 ha (Knowles et al. 1982), but the average on one study was 57.5 ha (Knowles and Knowles 1984) and ranged from 6 to 50 ha in another (Olson-Edge and Edge 1987).

Primary habitat use in Montana during the breeding season includes heavily grazed, shortgrass prairie sites. Habitat in Phillips and Blaine counties, the area containing the largest known populations of Mountain Plover in the state, is dominated by the native plant species *Bouteloua gracilis* and *Koeleria cristata.* This area also contains *Stipa comata*, *Agropyron smithii*, *Carex* spp., *Artemisia frigida*, *Opuntia polyacantha*, and *Gutierrezia sarothrae* (FaunaWest Wildlife Consultants 1991). Knowles and Knowles (1993) determined in the northeastern portion of the state, Mountain Plover also selected sites associated with habitat dominated by *Atriplex gardneri* and *Eriogonum multiceps*, while use in the central and southwestern areas of the state was associated with

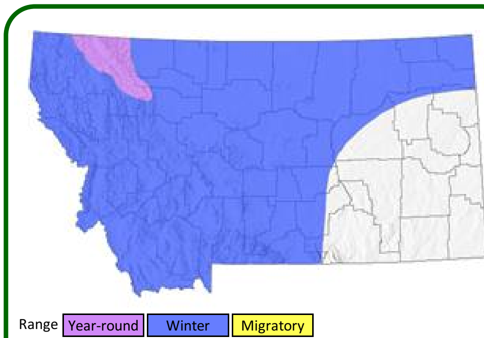
Bouteloua gracilis and *Stipa comata*. Strong preference was also given to sites with slopes less than 5% and grass height of less than 6 cm (3 inches) (Knowles et al. 1995). Knowles and Knowles (1993) indicates that sites selected within these habitat types were restricted to areas intensively grazed by prairie dogs, sheep, and/or cattle, especially those of the *Stipa comata* and *Bouteloua gracilis* habitat type (Knowles and Knowles 1997).

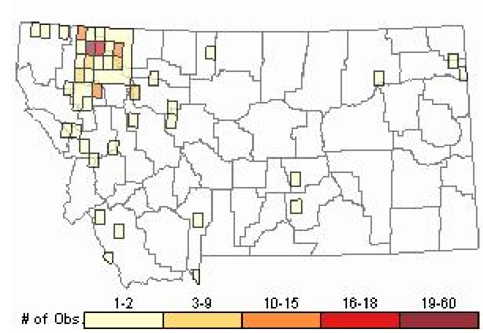
Northern Hawk Owl
Surnia ulula

View in Field Guide

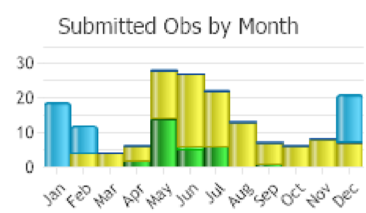
Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3, SGIN
PIF:





 # Observations: 181



General Description

The Northern Hawk Owl is aptly named, as it more closely resembles an *Accipiter* hawk species than an owl, both in morphology and behavior. This owl species is often quite visible, typically perching at the tops of trees. In flight, it moves at high speeds close to the ground or flaps its pointed wings using falcon-like strokes (Duncan and Duncan 2014).

The Northern Hawk Owl calls persistently during the breeding season. The display call of the male is a trilling, rolling whistling "*ululululululul*" lasting up to 14 seconds, while the female's advertising call is shorter and less constant in pitch and rhythm, with a hoarser and shriller quality (Duncan and Duncan 2014).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

In Montana, observations for this species have been recorded every month of the year (Montana Bird Distribution Committee 2012). Nesting records as early as March with fledglings observed May-September (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

The Northern Hawk Owl is easily distinguishable from other species of owls by its long tail, prominent perching habit, and fast, maneuverable flight. The posture of the Northern Hawk Owl is more hawk-like than owl-like. The unique shape of this bird, including its moderately wedge-shaped tail, and overall coloration and appearance make it unlikely to be confused with any hawk species (Sibley 2014).

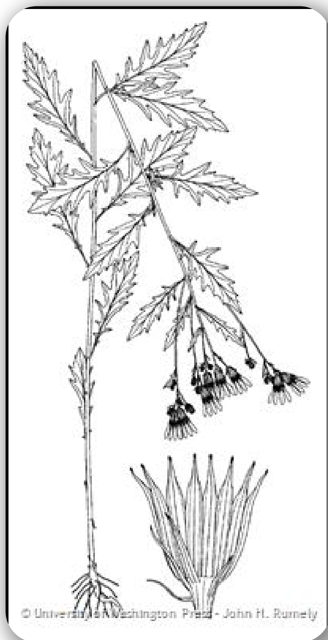
Females are slightly larger than males but can be as much as 17% larger by mass than males (Duncan and Duncan 2014). The back, wings, and head are brownish-black, spotted and streaked with white, while the white breast and belly are heavily and distinctly barred with brown. The head is fairly flat-topped head with a deep v-shaped black and white speckled forehead. The grayish-white facial disc is framed in black. The iris is yellow, the bill is pale yellow to greenish-yellow, and the flesh of the heavily feathered feet is colored a deep slate-gray to black (Duncan and Duncan 2014).

Habitat

The Northern Hawk Owl breeds in moderately dense coniferous or mixed coniferous-deciduous forests often adjacent to wet meadows and marshes or open areas created by fire or logging (Duncan and Duncan 2014). This species needs suitable perching sites such as snags. Winter habitat similar to breeding habitat but may occur in more open areas depending on prey irruptions (Duncan and Duncan 2014).

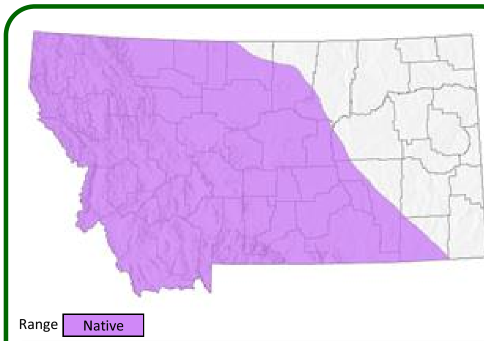
Desert Groundsel
Senecio eremophilus

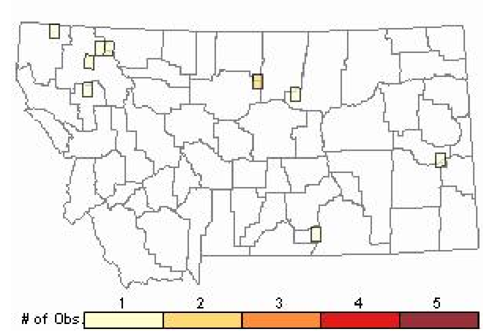
View in Field Guide



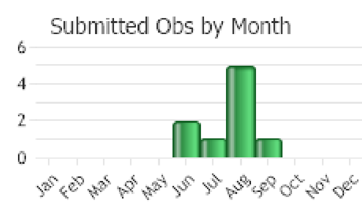
Species of Concern
Native Species
Global Rank: G5
State Rank: S1S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 4





 # Observations: 12



General Description

Desert Groundsel is a short-lived, glabrous, perennial herb with a solitary stem that is 3-12 dm high and arising from a short taproot. The lowest leaves are inconspicuous, while the others are alternate and little reduced upwards. Each leaf has a short petiole and a lance-shaped blade that is 4-15 cm long with deeply lobed and coarsely toothed margins. Numerous flower heads are borne in an open, flat-topped, terminal inflorescence. The heads have a single series of ca. 13 non-overlapping, narrow, pointed, minutely black-tipped involucral bracts that are 7-9 mm long. The ca. 40 disk flowers are yellow, and the ca. 8 yellow rays are 6-10 mm long. The achene has a pappus at its summit.

Our plants are variety *eremophilus*.

Phenology

Flowering in late June.

Diagnostic Characteristics

Senecio is a large genus, and a technical manual should be consulted for positive identification.

Habitat

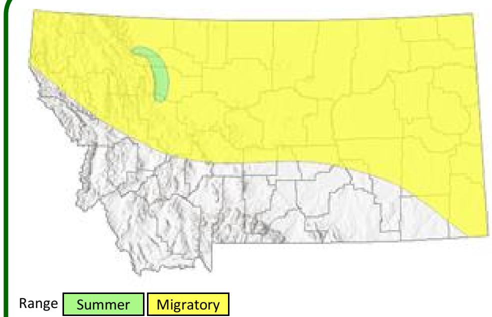
Moist streambanks and riparian forests in the valley and montane zones.

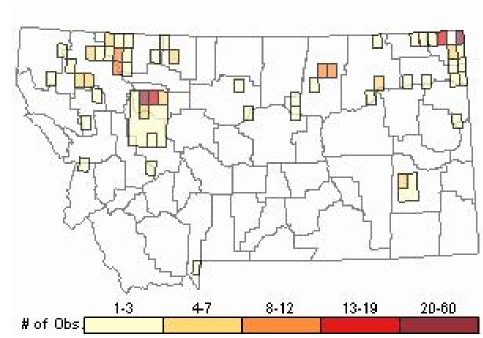
Alder Flycatcher
Empidonax alnorum

View in Field Guide

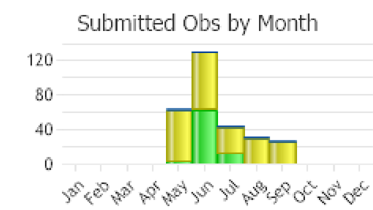
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF:





 # Observations: 292



General Description

Although large in the *Empidonax* genus, the Alder Flycatcher is a small species within the flycatcher family. Thirteen to seventeen centimeters in length, with a wingspan of approximately 21 cm, the Alder Flycatcher has dull greenish-olive upperparts with a similarly colored, but darker, crown. The eye-ring is narrow, whitish, and sometimes indistinct but rarely lacking, while the throat is clearly white and contrasts with a gray breast band. The bill is black on the upper mandible and dull yellow-orange or pinkish on the lower. The wings are darker than the back, have white-edged tertials (innermost secondaries) and wing-bars that are whitish and boldly marked (Lowther 1999).

The vocalization of the Alder Flycatcher is a harsh and burry, three syllable "*rreeBEEa*" or "*fee-BEE-o*" (Lowther 1999, Sibley 2000). For a more complete description, see below on distinguishing between the vocalizations of the Alder and Willow (*E. trailii*) flycatchers.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Other flycatchers found in Montana with which the Alder may be confused are the Least (*E. minimus*) and Willow Flycatchers. In comparison, the Least Flycatcher has a shorter, narrower bill, a bold, complete eye-ring, thinner tail, and different song (Lowther 1999, Sibley 2000). The general appearance of the Alder Flycatcher is so similar to that of the Willow Flycatcher that separating these two species visually can be extremely difficult (Lowther 1999).

The Alder Flycatcher is best separated from the Willow Flycatcher by voice. The song of the Alder Flycatcher (a 3-syllable "*fee-BEE-o*") is described as being harsh and burry in nature with a strongly accented second syllable, making it sound like a 2 syllable "*rrree- BEEP*" (Lowther 1999). The song of the Willow Flycatcher is accented on the first syllable, more of a "*FITZ-bew*," but may occasionally sound as though it has a subtle third syllable, "*FRITZ-be-yew*" (Lowther 1999). The call of the Alder is described more as an emphatic "*pip*" or "*pit*" (reminiscent of an Olive-sided Flycatcher) in contrast to the liquid "*whit*" of the Willow (Gorski 1969a, 1971, Lowther 1999, Sibley 2000). Lowther (1999) indicates that, generally, the Alder has a darker overall appearance, "slightly greener crown, more pointed wings, slightly shorter bill, and slightly longer tail."

Habitat

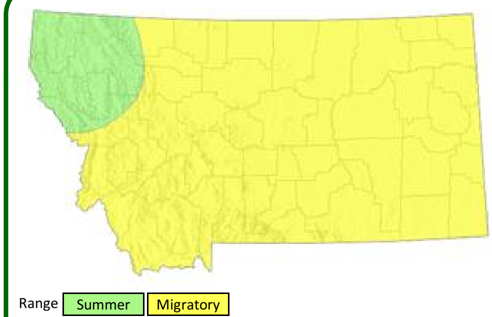
Habitat use is similar to that of the Willow Flycatcher and includes willow (*Salix*) thickets, red osier dogwood (*Cornus sericea*), or birch (*Betula* sp.) along the edges of wetlands, streams, lakes, and forests (Johnsgard 1992).

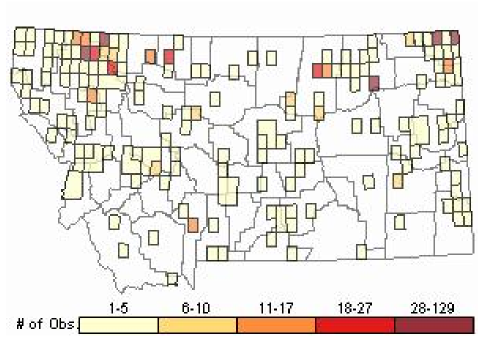
Tennessee Warbler
Leiothlypis peregrina

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S4B

Agency Status
USFWS: MBTA
USFS:
BLM:
PIF:





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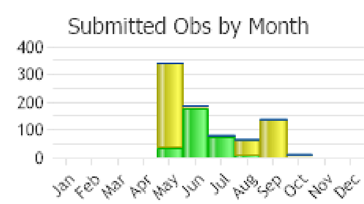


General Description

Small to medium-sized warbler (10-13 cm in length). Male in alternate plumage is plain and lacks distinctive markings; the crown and nape are grayish, contrasting with bright olive green upperparts and whitish underparts. Distinct blackish eye-stripe and narrow white supercilium. Female in alternate plumage is similar but duller, with less contrast between the head and remaining upperparts, a less-defined eye-stripe and supercilium, and a yellowish wash across the breast and flanks. Basic-plumaged adults and immatures are similar: gray green above and underparts tinged yellow. Females are generally duller and more yellowish below than males. Immatures have more strongly washed yellow underparts than adults. (Rimmer and McFarland 2012)

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Distinguished from all other warbler species except Orange-crowned Warbler by overall plain plumage characterized by unmarked white to yellowish underparts, unmarked olive green upperparts, lack of distinct wing-bars or tail-spots, and dark eye-stripe below yellowish to whitish supercilium. Distinguished from Orange-crowned Warbler by white rather than yellow undertail-coverts; by lack of faint, blurred streaks on sides of breast; by richer, brighter green on mantle and scapulars; and by significantly shorter tail and generally longer supercilium. (Rimmer and McFarland 2012)

Habitat

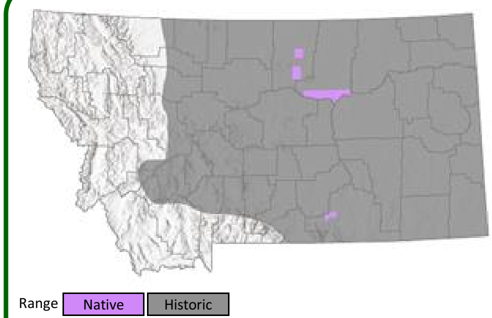
Breeds in the boreal zone in deciduous, mixed, and coniferous forests; found in a variety of successional stages. Associated with open areas with grasses, dense shrubs, and scattered clumps of young deciduous trees; strongly associated with shrubs. (Rimmer and McFarland 2012)

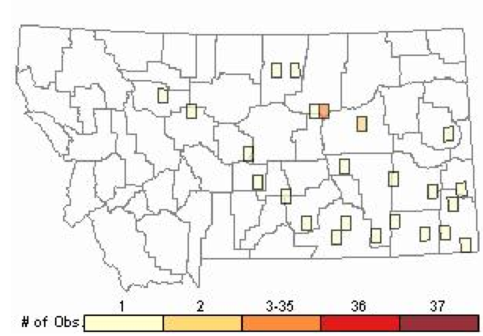
Black-footed Ferret
Mustela nigripes

View in Field Guide

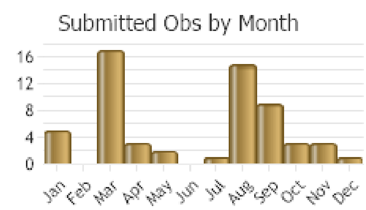
Species of Concern
Native Species
Global Rank: G1
State Rank: S1

Agency Status
USFWS: LE; XN
USFS:
BLM: ENDANGERED
FWP SWAP: SGCN1





 # Observations: 62



General Description

Black-footed Ferrets are weasel-like in body shape and form but are heavier than other weasels. The torso is long with short legs and a long tail. The color of the body is a soft cream color with the ears, chin and throat fading to white. The dorsal portion of the torso is darker than the rest of the body. The legs and tip of the tail are dark brown and a mask of the same color extends in a band from below each eye across the forehead.

Diagnostic Characteristics

Although similar in size and shape to the American Mink (*Mustela vison*), the much lighter body color and prairie habitat of the Black-footed Ferret are distinctive. Long-tailed Weasels (*Mustela frenata*) are smaller and less robust and do not have the distinctive black mask and feet of the ferret.

Habitat

Black-footed Ferrets are intimately tied to prairie dogs (*Cynomys* spp.) throughout their range and have only been found in association with prairie dogs. They are therefore limited to the same open habitat used by prairie dogs: grasslands, steppe, and shrub steppe. Black-footed Ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of Black-footed Ferrets. It has been estimated that about 40 to 60 hectares of prairie dog colony is needed to support one Black-footed Ferret, and females with litters have never been found on colonies less than 49 hectares (Miller et al. 1996). Black-footed Ferrets scent-mark to maintain spatial separation (Richardson 1986).

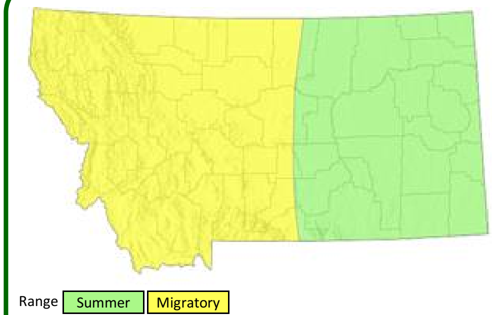
Montana Natural Heritage Program

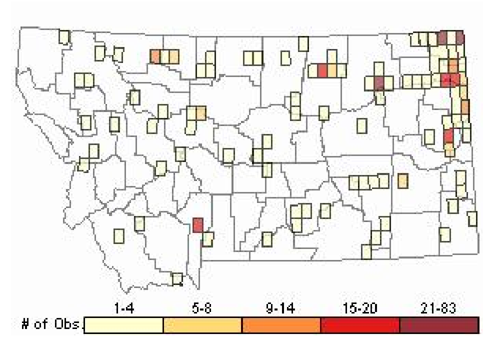
Black-and-white Warbler
Mniotilta varia

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S4B

Agency Status
USFWS: MBTA
USFS:
BLM:
PIF:





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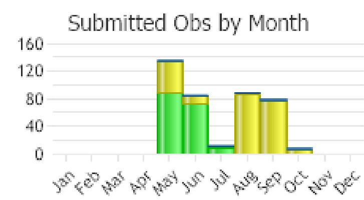


General Description

Distinctly striped in black-and white plumage with a slightly decurved bill for bark foraging, the Black-and-white Warbler moves vertically along tree trunks, exhibiting characteristics generally attributed to nuthatches. The adult body length ranges from 11 to 13 cm, with an average wingspan of 21 cm. Body mass ranges from 8.8 to 15.2 grams, and bill length from 10.0 to 13.7 mm. The female is the smaller of the two sexes. Males, exhibiting darker, more contrasted markings than females in both breeding and non-breeding plumages, are defined by conspicuous black and white coloration. In breeding plumage, the male crown has a broad white median stripe, black sides, and a broad white superciliary stripe that extends to the nape. The lores and ear coverts are black, while the submustachial stripe is white above a black throat with black and white streaked sides of the neck. A white eye-ring contrasts with black ear coverts. The upper and underparts are streaked with black and white, the underparts being the more distinct and boldly marked. The wings are black with two evident wing bars. The feathers of this warbler's truncate tail are dull black marked with white, revealing white tail spots. The female's breeding plumage is similar to the males, but with pale gray lores and ear coverts and less contrasting black and white markings overall. A narrow, black eye stripe, white throat, and a less defined streaking on the back also distinguish the female from the male. Additionally, the female's tail spots are less distinct and a faint buff wash on the flanks and sides of the throat is generally present (Kricher 1995). The eyes have a brown iris. The feet in the juveniles are a pinkish-buff, becoming darker to black with age.

The vocalization of the Black-and-white Warbler is described as a thin, high-pitched two syllable squeaky "weesee, weesee, weesee," or "squeaky, squeaky, squeaky," repeated upwards of ten times (Kricher 1995). One of the highest pitched of the wood warblers, the song of the Black-and-white Warbler is described as resembling the sound of a wet rag wiped repeatedly across glass (Bent 1953, Kricher 1995). During breeding, a variation of the primary song is of a longer, faster, and more varied pitch (Bent 1953). Although varied, the call note of this species can be described as a sharp "chip," "pit," or sharp rattling "stick" (Terres 1980, Sibley 2000).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Black-and-white Warbler is distinguished from similar warbler species by its distinctive black and white plumage and its nuthatch-like foraging behavior. Few other wood warblers forage in this manner, and those that do are not black and white in coloration. The two other black and white warblers in Montana, the Blackpoll Warbler and the Black-throated Gray Warbler, are noticeably different in plumage. The Blackpoll Warbler has an un-striped black crown and white cheek and throat, while the Black-throated Gray Warbler has a bright yellow spot in front of each eye, a solid black (or black and gray) un-striped head, and a mostly gray, un-striped back (Kricher 1995, Sibley 2000). Neither of these two species possess a decurved bill (Sibley 2000).

Habitat

Information on habitat use in Montana is limited. Existing records indicate observations in riparian habitat and woody draws, those of mixed deciduous and ponderosa pine (*Pinus ponderosa*), in the eastern part if the state (Skaar unpublished data). One observation record indicates a female feeding on Douglas-fir (*Pseudotsuga menziesii*) northeast of Helena, while numerous records exist for the deciduous habitat in the town park in Westby, as well as that of several backyards, specifically in the northeast portion of the state (Montana Bird Distribution Committee 2012).

In general, the Black-and-white Warbler inhabits young, medium-aged and mature deciduous and mixed forests during the breeding season (Bushman and Therres 1988, Kricher 1995). Studies of habitat selection have yielded conflicting results that appear to be due to geography, as well as variations in forest type and stand age. In the southern part of its range, this species appears to be most closely associated with relatively closed-canopied forests with low shrub density (Conner et al. 1983, Crawford et al. 1981, Noon et al. 1980, Wilson et al. 1995). In aspen forests in Alberta, however, stands with high shrub density were avoided (Westworth and Telfer 1993). Black-and-white Warblers were associated with high tree density and high canopy volume (indicative of mid- to late-successional forests) in mixed forests of central Ontario (Clark et al. 1983). The Black-and-white Warbler typically nests on the ground, often adjacent to a tree, shrub, rock, stump or log, under a shrub or dead branches, or, more rarely, atop stumps (Bent 1953, Kricher 1995).

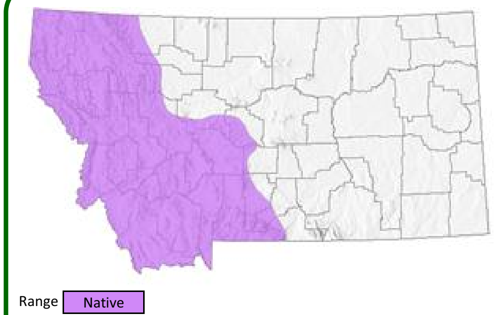
A wide variety of habitats are used during the non-breeding season, from early successional disturbed areas to mature forests (Kricher 1995). Caribbean habitats utilized include coastal forest, dry interior forest, wet forest, forest edge, pine woods, riparian areas, wetlands, urban habitats that provide plant cover, and some open areas (Arendt 1992). Cacao, citrus, mango, shade coffee, and pine plantations in Puerto Rico, Jamaica, and Costa Rica are also selected (Robbins et al. 1992). Even though it showed a preference for undisturbed habitats, particularly forest, this species is considered a habitat generalist in western Mexico (Hutto 1992). Primary forest is preferred to other habitat types in the Yucatan Peninsula, Mexico (Greenberg 1992, Lynch 1989) and in Veracruz, Mexico (Rappole et al. 1992). In the Virgin Islands, they exhibited a preference for moist forest (90.5% of detections) over other habitat types (Askins et al. 1992).

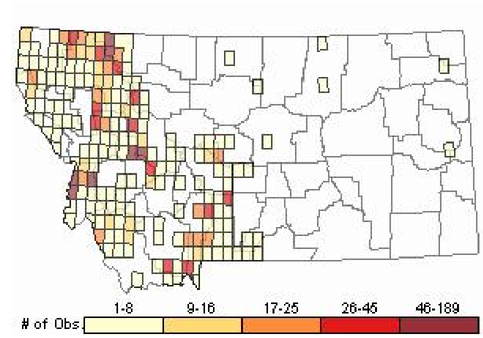
Wolverine
Gulo gulo

View in Field Guide

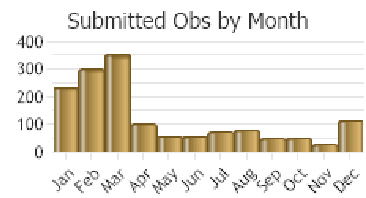
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS: Sensitive
BLM: SENSITIVE
FWP SWAP: SGCN3





 # Observations: 1951



General Description

The Wolverine is a bear-like mustelid with massive limbs and long, dense, dark brown pelage, paler on the head, with two broad yellowish stripes extending from the shoulders and joining on the rump. Variable white or yellowish markings are often present on the throat and chest. The tail is bushy. The feet are relatively large (6.5 to 11.3 centimeters total length) with robust claws. Wolverines weigh between 7 and 32 kilograms and range from 0.9 to 1.1 meters in length. Females average about 10% less than males in linear measurements and 30% less in mass (Ingles 1965, Hall 1981, Nowak 1991).

Diagnostic Characteristics

Wolverines are most similar to Fishers (*Martes pennanti*) but are nearly twice as large. Fishers also lack the light colored lateral markings of the Wolverine and the tail is less bushy. Badgers have shorter legs and are much lighter colored with a distinctive black and white pattern on the face.

Habitat

Wolverines are limited to alpine tundra, and boreal and mountain forests (primarily coniferous) in the western mountains, especially large wilderness areas. However, dispersing individuals have been found far outside of usual habitats. They are usually in areas with snow on the ground in winter. Riparian areas may be important winter habitat. When inactive, Wolverines occupy dens in caves, rock crevices, under fallen trees, in thickets, or similar sites. Wolverines are primarily terrestrial but may climb trees.

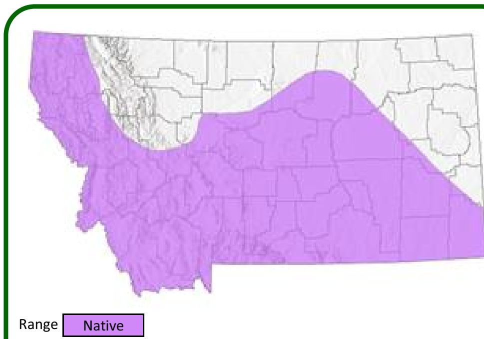
In Montana, Hornocker and Hash (1981) found most Wolverine use in medium to scattered timber, while areas of dense, young timber were used least. Wolverines avoided clearcuts and burns, crossing them rapidly and directly when they were entered at all. Hash (1987) reported Wolverines in the Northern Rocky Mountain region were associated with fir, pine, and larch. Aspen stands were also used, as were cottonwoods in riparian areas. Ecotonal areas appeared to be important habitat components (Hash 1987). Hatler (1989) believed Wolverines are not dependant on any particular vegetative habitat type. Banci (1986) reported "habitat requirements appear to be large, isolated tracts of wilderness supporting a diverse prey base, rather than specific plant associations or topography." South of the boreal forest, most habitat descriptions in the literature agree with Grove's (1988) characterization of "large, mountainous, and essentially roadless areas."

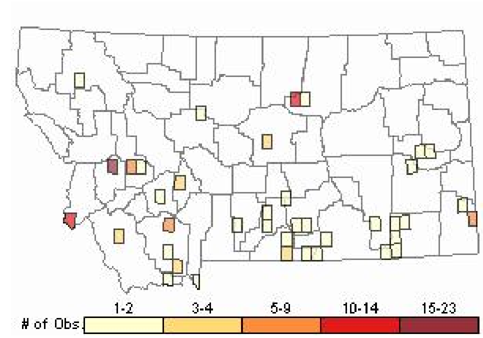
Vivid Dancer
Argia vivida

[View in Field Guide]

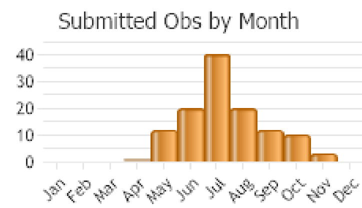
Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S5

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 118



General Description

Information on this species is incomplete.

Habitat

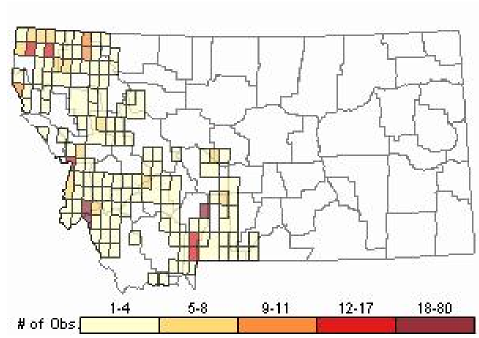
Vivid Dancer habitat includes vegetated spring-fed streams, seeps, and pools, as well as small streams with emergent vegetation and a riparian component, hot springs and irrigation canals with flow (Westfall and May 1996, Nikula et al. 2002, Acorn 2004, Paulson 2009). Habitats with sedge vegetation and rocks, as well as nearby woody vegetation are important for roost sites (Paulson 2009).

Boreal Owl
Aegolius funereus

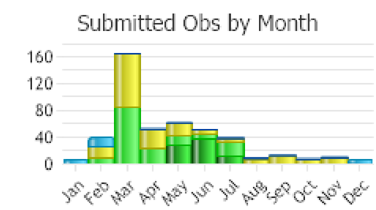
View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S4

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGIN
PIF: 3



 # Observations: 514



General Description

Round-headed, although head appears rectangular. Eyes yellow, bill yellow/white. Facial disk white, surrounded by distinct black trim. Forehead spotted. Ventrally, white with brown vertical streaks along chest, sides, and flanks. Dorsally, brown with large conspicuous white spots. Juveniles have a dark brown/black facial disk, white forehead, and are light chocolate brown throughout the upper chest, grading into light brown on the belly. By early winter, juveniles resemble adults in plumage. SIZE: nine to 11 inches. WEIGHT: four to six ounces. VOICE: "To, to, to, to" given rapidly and varying in number. Voice is similar to Common Snipe.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Saw-whet Owl is smaller, bill is black, has reddish/brown on the facial disk, and ventral streaking.

Habitat

High elevation spruce/fir forest, with lodgepole pine sometimes present. Mature spruce/fir forests with multilayered canopies and a highly complex structure, at elevations greater than 1500m with a mosaic of openings or meadows (Hayward 1989). In central Idaho, owls nested in mixed conifer (40%), spruce-fir (18%) Douglas-fir (21%) and aspen stands (21%) (Hayward 1989). One nest in MT was found in a dead broken-topped subalpine fir; nest opening measured 73X64 mm (Holt and Ermatinger 1989). Nests in MT have been exclusively lodgepole pine and spruce fir; no owls were found below 1292m in MT or ID (75% occurred above 1584m) (Hayward and Verner 1994).

Giant Sulphur
Colias gigantea

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:

 # Observations: 0

General Description

Variously considered a subspecies of *Colias scudderi* and a full species (Klots 1940; Ferris and Brown 1981; Scott 1986; Ferris 1987; Guppy and Shepard 2001; Pyle 2002; Hammond and McCorkle 2008). The subspecies of *C. gigantea* considered most prevalent and widespread in Montana has recently been renamed from *harroweri* to *kohleri*, both still retained as subspecies of *C. scudderi* (Hammond and McCorkle 2008), with *kohleri* perhaps originating through hybridization between *C. scudderi* and *C. occidentalis* and converging in appearance to *C. gigantea*! Given the taxonomic uncertainty and instability, this account probably includes information pertaining to more than one species.

[From Ferris and Brown 1981; Scott 1986; Opler and Wright 1999; Glassberg 2001; Pyle 2002] Forewing 2.4-2.8 cm. Medium sized. Wing fringes yellow tinged with pink in male, all-pink in female. Uppersurface of male yellow with narrow and complete black border, lower edge of forewing straight; females dimorphic, pale yellow form (often) and white form, both with black border often reduced or absent to apically pronounced in the forewing. In both sexes, undersurface of forewing lacking submarginal black spots or patches, hindwing undersurface with large pink-rimmed and elliptical cell spot (wider than high), often with small satellite spot above it.

Phenology

One flight; late June to August (Scott 1986). Mainly July to mid-August (Glassberg 2001). Late July to August in the Rocky Mountain states (Ferris and Brown 1981; Ferris 1987), late June through July in British Columbia (Guppy and Shepard 2001).

Diagnostic Characteristics

Usually distinguished by a combination of the wing fringes yellow tinged with pink in male, all-pink in female, the uppersurface of male yellow with narrow and complete black borders; female in 2 forms, yellow or white, both may have black border reduced or lacking to apically pronounced in forewing; undersurface without submarginal black spots, hindwing with large pink-rimmed and elliptical cell spot (wider than high), often with small satellite spot above it.

Habitat

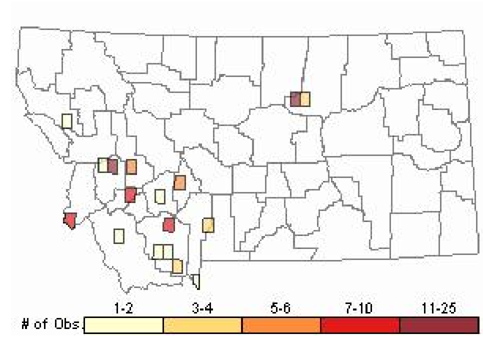
Montane willow bogs, open boggy meadows, riparian bogs, seepage areas in semi-open lodgepole pine forest, tundra and taiga bogs (Klots 1940; Oosting and Parshall 1978; Ferris and Brown 1981; Scott 1986, 1992; Ferris 1987; Opler and Wright 1999; Hamond and McCorkle 2008). In Montana, reported from subalpine meadows, on mountain slopes, along creeks, in hydric montane meadows, always in open dwarf-willow bogs (Hammond and McCorkle 2008; Debinski et al. 2013); in Greater Yellowstone Ecosystem reported from wet willow bogs (Debinski and Pritchard 2002).

Flame Skimmer
Libellula saturata

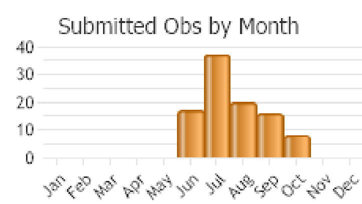
View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S4

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 98



General Description

This striking red dragonfly generally occupies habitat in and around warm to hot springs or the ponds associated with them.

Habitat

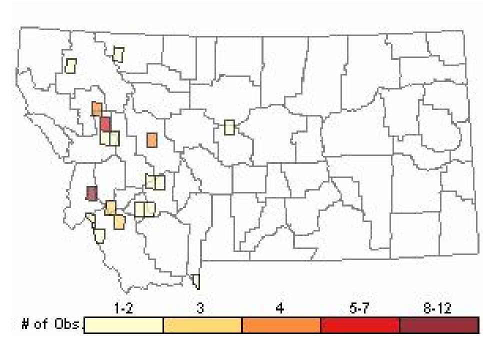
Flame Skimmers select a broad range of habitat choices including lakes, ponds, ditches, pools, slow streams and stream pools, as well as hot springs in the north and high altitudes (Dunkle 2000, Nikula et al. 2002, Paulson 2009).

Ocellated Emerald
Somatochlora minor

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S4

Agency Status
USFWS:
USFS:
BLM:



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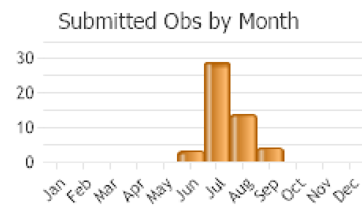


General Description

Information on this species is incomplete.

Habitat

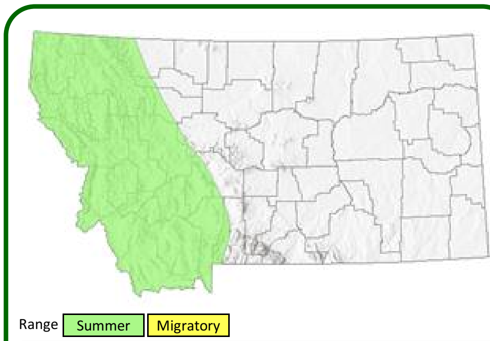
The Ocellated Emerald prefers clear, small to medium, flowing forest streams without emergent vegetation as habitat, especially stream pools and areas where streams leave the forest and open into meadows (Dunkle 2000, Paulson 2009).

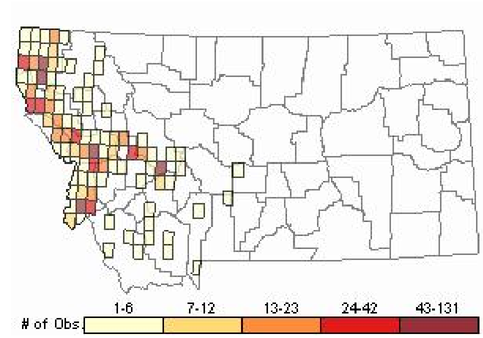
Flammulated Owl
Psiloscops flammeolus

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 1





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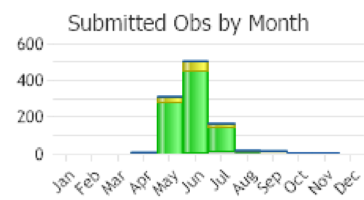


General Description

At 6.75 inches and only 60 grams, Flammulated Owls are one of the smallest owls in North America. Only Elf Owls (*Micrathene whitneyi*) are smaller. Other than females being somewhat larger than males, the sexes are extremely similar in appearance. The species has short ear tufts and an incomplete facial disk beginning at the ears and ending at the moustache. The eyes are dark. The wings are longer and more pointed in comparison to other species in the genus. The plumage of Flammulated Owls is gray with dark streaks and crossbars (McCallum 1994a). Also, some rufous coloration is visible, especially near the face and on the shoulders. It is unsure whether a distinct red phase exists.

Flammulated Owls are usually heard more often than seen. The song of the male is described as a low-pitched, short, soft hoot like "*poop*" or "*pooip*" which is repeated every two to three seconds (Sibley 2000). Females are usually higher-pitched, longer in duration, and more quavering (McCallum 1994a).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The dark eyes of Flammulated Owls distinguish them from any other North American owl of similar size. Also, their size and short ear tufts distinguish them from all North American *Megascops* species. Lastly, the low-pitched, soft, monosyllabic hoots will rule out any other forest owl in North America, except for Long-eared Owls (*Asio otus*). Flammulated Owls' small size, vocalization, eye color, and head/ear shape in combination are diagnostic.

Habitat

Information on breeding habitat in Montana is limited to one study in the Bitterroot Valley (Wright 2000). In Montana, Flammulated Owls are associated with mature and old-growth xeric Ponderosa Pine/Douglas-fir stands (Holt and Hillis 1987, Wright et al. 1997) and in landscapes with higher proportions of suitable forest and forest with low to moderate canopy closure (Wright et al. 1997). They are absent from warm and humid pine forests and mesic Ponderosa Pine/Douglas-fir (McCallum 1994a, Wright et al. 1997). Information gathered from other studies throughout their range suggest the breeding habitat of Flammulated Owls is montane forest; usually open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement Ponderosa Pine forests). The species shows a strong preference for Ponderosa Pine (*Pinus ponderosa*) and Jeffrey Pine (*P. jeffreyi*) throughout its range (McCallum 1994b). They prefer mature growth with open canopy avoiding dense young stands. Flammulated Owls are found in a cooler, semi-arid climate, with a high abundance of nocturnal arthropod prey and some dense foliage for roosting (McCallum 1994a). Most often they are found on ridges and upper slopes (Bull et al. 1990, Groves et al. 1997).

In British Columbia, Flammulated Owls use dry interior Douglas-fir (*Pseudotsuga menziesii*) where Ponderosa Pine may be a codominant, but pure Ponderosa Pine is avoided. Also sometimes they are in pure aspen and, locally, in spruce (*Picea* sp.)/Douglas-fir and Lodgepole Pine (*Pinus contorta*)/Douglas-fir. They prefer forests dominated by trees more than 100 years old. The highest densities are found in 140 year-old to more than 200 year-old forests; owls were restricted to forests with multi-layered canopies with an abundance of large, well-spaced trees interspersed with grassy openings up to 2 hectares in size, and where cavity-bearing snags were "moderately common" (Howie and Ritcey 1987, van Woudenberg 1999). A study in the Kamloops area testing a habitat model in Douglas-fir/Ponderosa Pine found three variables to be significant predictors for occupied habitat: elevation (between 850 and 1,150 meters), age class (older stands), and canopy closure (40 to 50 percent) (Christie and van Woudenberg 1997).

In Idaho, they are found mostly in mature stands of Ponderosa Pine, Douglas-fir, or mixtures of the two with relatively open canopies (Atkinson and Atkinson 1990), occasionally in stands of pure Douglas-fir or aspen where Ponderosa Pine is absent. Sixty-five percent of detections were on upper slopes or ridges. Tree densities were approximately 500 per hectare and the mean DBH (diameter at breast height) for all trees was 32 centimeters (Groves et al. 1997). One nest cavity, excavated by a Northern Flicker, was in a 6.5 meter tall, 34 cm dbh, Douglas-fir snag (Atkinson and Atkinson 1990). In northeast Oregon, nest trees were located in stands of old-growth Ponderosa Pine or mixed conifers near small clearings (Bull and Anderson 1978). In Colorado, they show strong preference for old-growth Ponderosa Pine and Douglas-fir, using older trees for foraging and singing (Reynolds and Linkhart 1992, Linkhart and Reynolds 1997).

Territories consistently occupied by breeding pairs were those containing the largest portion (more than 75 percent) of old-growth (200 to 400 years), whereas territories occupied by unpaired males and rarely by breeding pairs contained 27 to 68 percent old-growth (Linkhart and Reynolds 1997). Aspen (*Populus tremuloides*) is often a component of nesting habitat in Colorado and Nevada (Reynolds and Linkhart 1987b, McCallum 1994b). In northern Utah, the species has successfully nested in nest boxes in montane deciduous forests dominated by aspen with some scattered firs (Marti 1997).

Flammulated Owls prefer to forage in yellow pine and/or Douglas-fir, and these forest types apparently support a particular abundance of favored lepidopteron prey (McCallum 1994b). In Oregon, they forage in Ponderosa Pine and Douglas-fir types with low to medium stem density, but show particular preference for forest/grassland ecotones (Goggans 1986, cited in McCallum 1994b). In Colorado, they preferred to forage in old-growth (more than 200 years), which was related both to an abundance of lepidopteron prey and to the open crowns and park-like spacing of trees which allowed greater room to maneuver for the owls (Reynolds et al. 1989). The species may focus foraging in a few "intensive foraging areas" within the home range, averaging 1 hectare per range (Linkhart 1984, cited in McCallum 1994b).

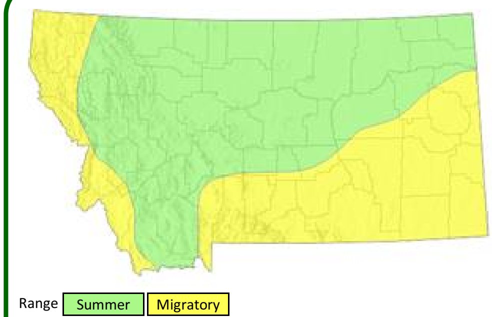
Flammulated Owls roost in dense vegetation and thickets that provide shade and protection from predators. They often roost close to trunks in fir or pine trees, or in cavities (McCallum 1994b, USDA Forest Service 1994). In Oregon, they use mixed coniferous forest rather than pure Ponderosa Pine (Goggans 1986, cited in McCallum 1994a). In Colorado, large Douglas-firs or pines with a spreading form are used (Linkhart 1984, cited in McCallum 1994a). They roost close to nests (20 to 25 meters) during the nestling stage and just before fledging, and farther away before and after (McCallum 1994a). In British Columbia, Flammulated Owls roosted in regenerating thickets of Douglas-fir (Howie and Ritcey 1987). Migration habitat is in wooded and open areas in lowlands and mountains, including riparian areas and breeding habitat (McCallum 1994a).

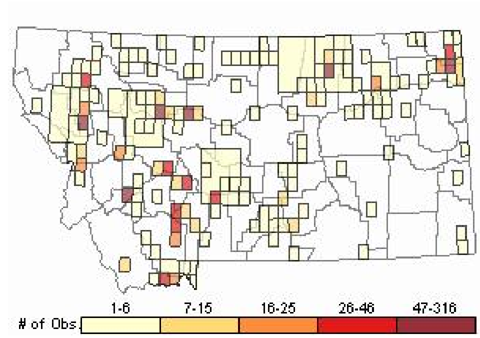
Forster's Tern
Sterna forsteri

View in Field Guide

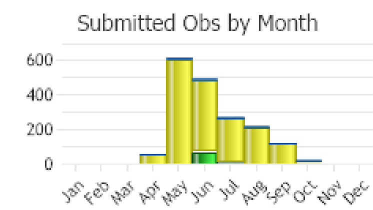
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





 # Observations: 1793



General Description

The Forster's Tern is a medium-sized, primarily white tern with a black cap and dark eyes. The back and wings are a pale silvery-gray, contrasting with the white of the neck and belly. The primaries and the deeply forked tail on the breeding adult bird are also a pale gray, with the primaries appearing as white as they become worn. During the breeding season, the large bill is orange and tipped in black, and the legs are bright orange or orange-red. In non-breeding plumage the bill is black and the legs are a duller red-brown (McNicholl et al. 2001). During non-breeding season, the primaries are dark silvery-gray and the crown is white with an evident large black patch encompassing and extending behind the eye (Sibley 2000). The bird is approximately 13 inches (33 cm) in length with a 31 inch (79 cm) wingspan.

The common call of this bird is a simple descending "*kerrrr*", described as lower and more raspy and wooden-sounding than the Common Tern (Sibley 2000). Sibley (2000) notes the species also has a "*kit*" or "*kuit*" common call; a begging "*kerr kerr kerr*" during courtship; and a very low "*zaaaar*" during defensive attack.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

White wings and underparts give the Forster's Tern a lighter and brighter overall appearance than the Common Tern. The Forster's Tern is also distinguishable from the Common Tern by its longer and stouter bill, longer tail, and more orange, rather than red, colored bill (McNicholl et al. 2001).

Habitat

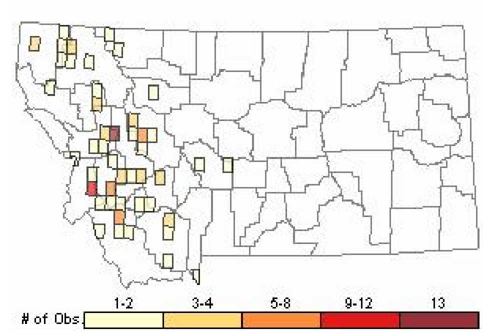
Large marshes with extensive reed beds or Muskrat houses that provide nesting structures are the preferred breeding habitat for the Forester's Tern. It is also occasionally found along marshy borders of lakes and reservoirs in Montana. The species generally nests colonially, with as many as five nests recorded on one Muskrat house (Johnsgard 1992). Preferred nesting locations include both nesting and foraging sites within close proximity. Saltmarsh bulrush (*Scirpus maritimus*) was used as nesting substrate at Benton Lake National Wildlife Refuge (Montana Bird Distribution Committee 2012). A study in the Lewistown District of the Bureau of Land Management documented that five of the six sites selected by the Forster's Tern were larger than 100 acres, with emergent vegetation covering more than 25% of the shoreline (Feigley 1997). Four of the nesting sites were on permanent bodies of water, with the remaining two on temporarily flooded sites (Feigley 1997).

Sedge Darner
Aeshna juncea

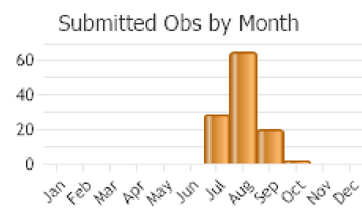
View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S5

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 116



General Description

The Sedge Darner is a a fairly uncommonly occurring member of the family Aeshnidae in Montana, and a potential species of concern. Darners are among the largest and fastest-flying North American dragonflies. This is a pale species, bluish areas being ampler than in most other Aeschnas. Face greenish blue, more or less overspread with brownish except on sides of the frons and facial lobes of postclypeus. Black crossbands on fronto-clypeal suture and on both front and rear margins of labrum. Black T spot above has an ill-defined front margin; its stalk is widened to its confluence with black of vertex. Top of vertical tubercle broadly yellow, occiput obscurely so. All pale stripes of thorax broad and all carinae narrowly black. Two stripes on front broadly widened laterally under crest. Between the two on each side, a short intervening half stripe terminates wide at top and tapers to a point halfway down toward spiracle. Legs brown, paler basally. Wings dull hyaline, with tawny costa and stigma. Cells in fork of radial sector and on both radial and median planates rather more numerous and irregular than is usual in Aeschna. Abdomen brown, broadly marked with blue; black on all carinae and on joinings of middle segments. Two swollen basal segments have a middorsal yellow line; sides of 2 streaked with brown and yellow, and all yellow below auricle in male. Each auricle armed with four minute teeth. Segment 3 moderately constricted. Darkening segments beyond 3 have usual spots larger than in other species, postero-dorsal one increasing markedly to rearward, covering most of depressed dorsum of 10. Mid-dorsal tubercle of 10 low and erect. The nymphs of Aeschna are among the most graceful of odonate nymphs, streamlined of body and neatly patterned in markings of green and brown that tend to run in longitudinal bands when among the green stems of water plants, in camouflage. The head is a little flattened. The legs are slender and pale, usually ornamented with rings of brown or of lighter and darker greens. The abdomen is widest in the middle and tapers gracefully to its slender tip (Needham and Westfall, 1955).

Habitat

Sedge Darners occupy ponds, lakes, pools, bays, and marshes with extensive sedge vegetation, as well as mossy fens, semipermanent ponds, ditches with emergent vegetation, and quiet stream portions in forested areas (Dunkle 2000, Paulson 2009). This species is known to hunt on and around tree trunks late into evening (Dunkle 2000).

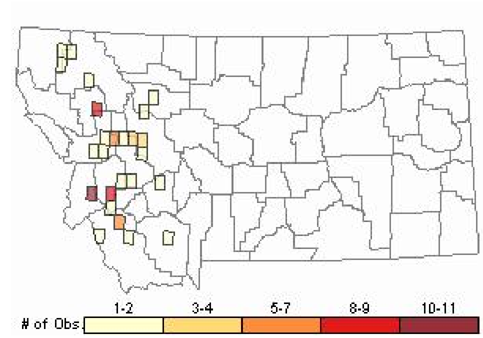
Zigzag Darner

Aeshna sitchensis

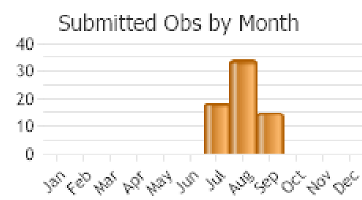
[View in Field Guide]

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 67



General Description

The Zigzag Darner is a relatively small, fairly uncommonly occurring member of the family Aeshnidae in Montana and a potential species of concern. Preferred habitat includes small bog pools with little to no emergent vegetation as well as fens and other shallow cold water pools with some moss cover and nearby wooded uplands. Many breeding sites chosen by this species dry up during the summer months (Dunkle 2000, Paulson 2009). The zigzag darner is distinctive with its zigzag thoracic stripes and a brown abdomen with pale blue spots.

Diagnostic Characteristics

The zigzag darner is distinctive with its zigzag thoracic stripes, small size and a brown abdomen with pale blue spots.

Habitat

Zigzag Darners prefer small bog pools with little to no emergent vegetation as well as fens and other shallow cold water pools with some moss cover and nearby wooded uplands. Many breeding sites chosen by this species dry up during the summer months (Dunkle 2000, Paulson 2009). Away from breeding sites this species can often be found perching on light-colored substrates located on the ground, on logs and trees in the nearby wooded uplands or in open clearings and logging roads. Although males mostly feed at breeding sites, both sexes also feed away from the water, but not late into the evening or swarms (Dunkle 2000 Paulson 2009). They have also been observed in wet meadows (Miller and Gustafson 1996).

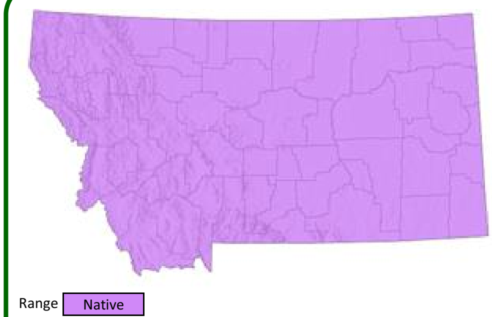
Alkali Bluet

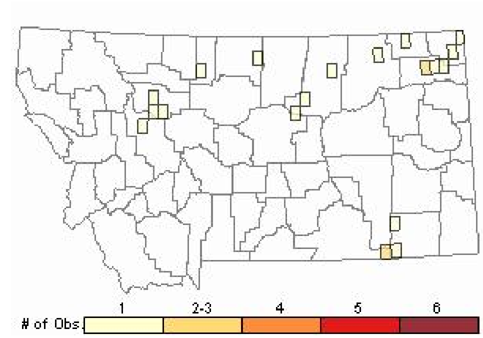
Enallagma clausum

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S4

Agency Status
USFWS:
USFS:
BLM:





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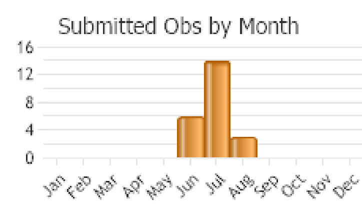


General Description

Information on this species is incomplete.

Habitat

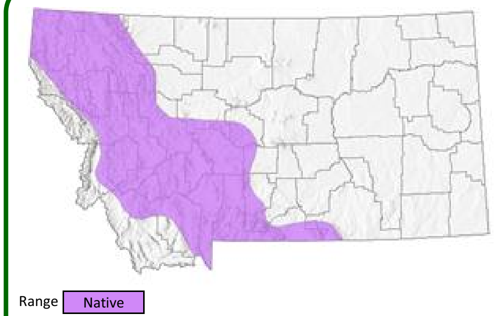
The Alkali Bluets habitat preferences include saline and alkaline, as well as freshwater lakes and ponds and large rivers with or without emergent vegetation. In the west, this species can be found in habitats too alkaline for any other odonate to occupy (Westfall and May 1996, Acorn 2004, Paulson 2009).

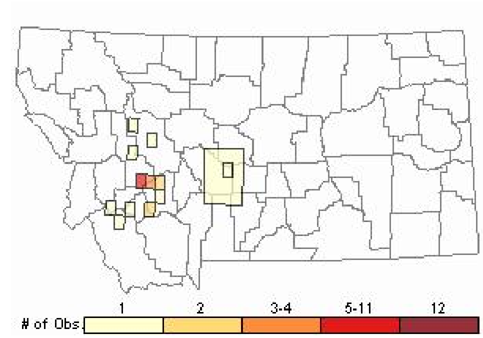
Boreal Whiteface
Leucorrhinia borealis

View in Field Guide

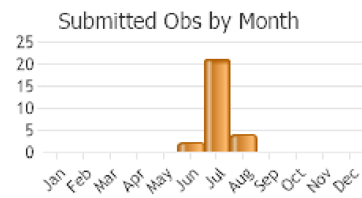
Species of Concern
Native Species
Global Rank: G5
State Rank: S1

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 28



General Description

Leucorrhinia borealis is a medium sized dragonfly with a white-face and crimson-gold patches on the top of the thorax and abdomen. It is widely distributed across much of the United States and Canada, exhibiting habitat preferences for well-vegetated ponds, bogs, and deep-water sedge meadows. Drought and water-level manipulations are the greatest immediate threats to this species,

Diagnostic Characteristics

L. borealis can be distinguished from others in this genus because, the tops of most abdominal segments have reddish-gold shield-like spots, and the spot on the 7th abdominal segment is longer than wide and extends to the end of the segment (Paulson 2007).

Habitat

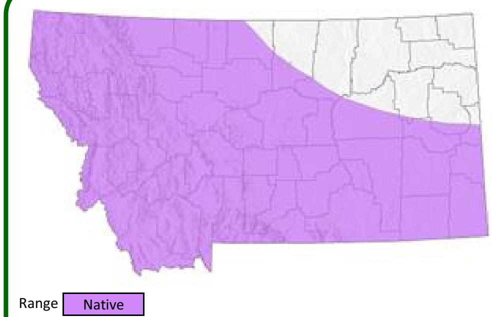
The habitat of Boreal Whitefaces includes sedge marshes, mossy fens and bogs, and vegetated ponds and lakes. They are presumably on prairie lakes and ponds as well (Dunkle 2000, Paulson 2009).

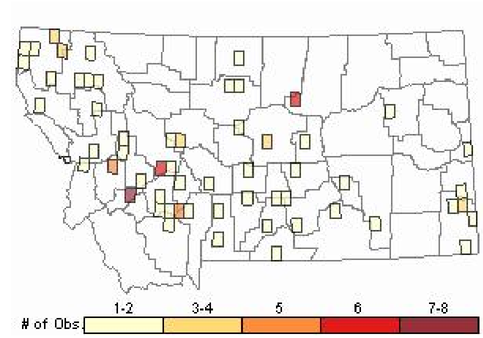
California Darner
Rhionaeschna californica

View in Field Guide

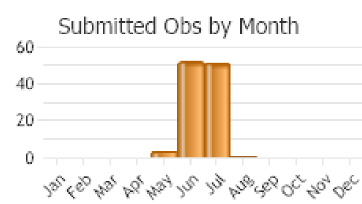
Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S5

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 107



General Description

Information on this species is incomplete.

Habitat

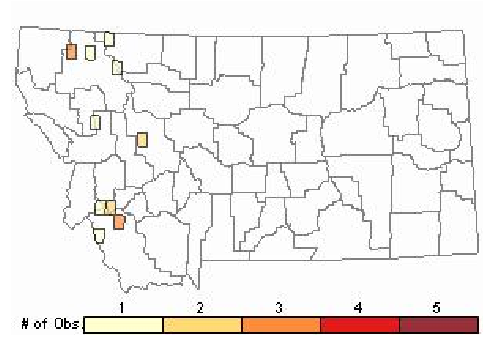
The California Darner prefers habitats like lakes, ponds, marshes and stream pools with edge vegetation including many with alkaline water conditions(Dunkle 2000, Paulson 2009).

Hudsonian Emerald
Somatochlora hudsonica

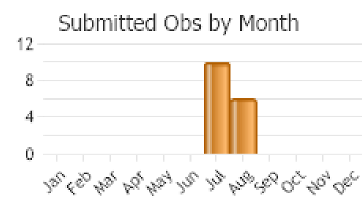
View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S4

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 16



General Description

The Hudsonian emerald dragonfly is typical of all emeralds with having brilliant green thoracic stripes and eyes. Dunkle (2000) characterized the habitat of Hudsonian emerald dragonfly as being that of deep, sedge-bordered lakes and ponds, but also as ponds with lake inlets, boggy edges, and sedge marshes. They may also be found at boggy slow streams, ditches, and sloughs. The larvae are found mostly in “mucky” edges of woodland streams and bogs (Needham et al.2000).

Diagnostic Characteristics

Dunkle (2000) characterizes most species as possessing one or two pale lateral stripes or spots on the thorax and brilliant green eyes (can be red in juveniles); thorax often coated with metallic green wax; pale dorsally with a pale ring between S2 and S3.

Habitat

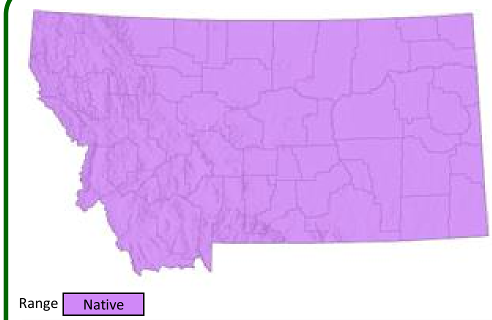
Hudsonian Emeralds prefer sedge-bordered lakes, ponds and marshes, boggy slow streams with pools, lake inlets, as well as ditches and sloughs (Dunkle 2000, Paulson 2009).

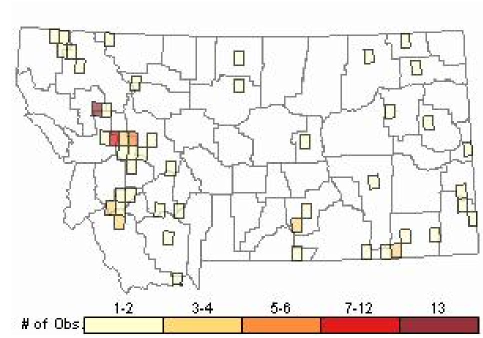
Red-veined Meadowhawk
Sympetrum madidum

View in Field Guide

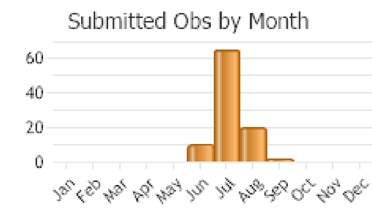
Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S3

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 97



General Description

Information on this species is incomplete.

Habitat

The Red-veined Meadowhawk prefers shallow, often saline and usually temporary, marshy ponds that often dry up during the summer months, as well as marshy pools in slow streams (Dunkle 2000, Paulson 2009).

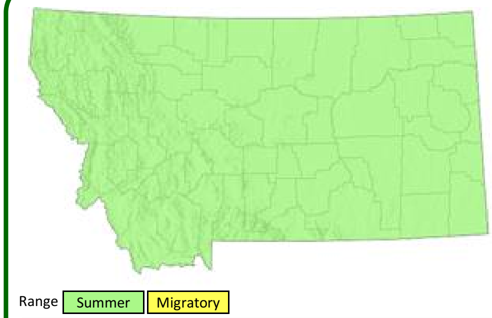
Black Tern

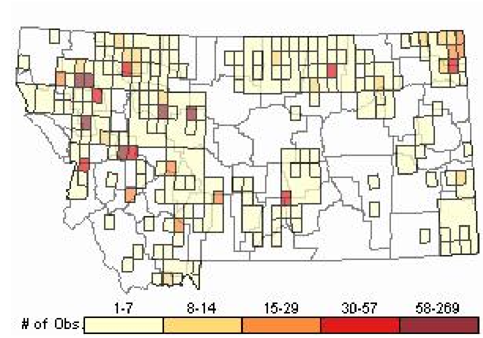
Chlidonias niger

View in Field Guide

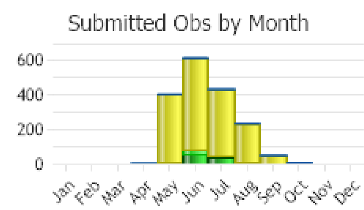
Species of Concern
Native Species
Global Rank: G4G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10; BCC11; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





 # Observations: 1789



General Description

The head and body of breeding Black Terns are black, fading to gray on the rump. The undertail coverts are white. The upper surface of the wings and tail are dark gray, and the wing linings are pale gray. The leading margin of the wing from the body to the first digit is white. The bill is black and the feet are a dark reddish-purple (Goodwin 1960, Farrand 1983). Females are somewhat duller black than males, but this difference is often difficult to distinguish in the field (Goodwin 1960). Black Terns begin their prebasic (postbreeding) molt in late June when eggs begin to hatch. White feathers appear first around the eyes and cheeks, then on the forehead, neck, throat and breast, and finally on the abdomen. Heavily molting adults take on a peculiar, piebald appearance. The prebasic molt is completed during fall migration (Goodwin 1960). In basic (winter) plumage, the underparts are pure white except for a small, dark patch on each side of the breast. The back becomes a shade of gray similar to the wings and tail. A blackish cap joins black ear coverts on the otherwise white head (Goodwin 1960, Farrand 1983). The juvenile plumage is similar to the basic plumage, but the feathers of the back are darker and the wing coverts and cap are barred and scalloped brown (Goodwin 1960, Farrand 1983). The total length of adults is 23 to 26.5 cm (9 to 10.5 inches).

Vocalizations include shrill, somewhat metallic alarm notes, described as "*kik*" or "*keek*", depending upon intensity and level of motivation, and a complex of contact calls described as "*kyew*", followed by one to four additional syllables, as "*kyew-dik*", "*kyew-dik-ik*", etc. (Goodwin 1960). The "*kik*" call commonly serves as a signal of impending danger in the nesting area. It may also be given during the ascent portion of the courtship flight. The "*keek*" call is similar to, but more shrill and forceful than, the "*kik*" call, and is given during aggressive attacks on enemies in close proximity to the nest. The frequency of repetition increases as they become more aggressive. The "*kyew*" calls are given as parents approach and leave the nest, during foraging flights, by adults accompanied in flight by young, by parents calling to young at or near the nest, by parents at the nest during incubation, brooding and feeding, and during the courtship flights (Goodwin 1960).

Black Tern eggs are ovate with a tendency toward ovate-pyriform (Bent 1921). Ground color varies from dark olive to light buff with markings of dark brown and gray. Markings vary from small dots and scrawls to very large blotches and are often particularly heavy around the larger end of the egg (Goodwin 1960). The average dimensions for 122 eggs in the U.S. National Museum were 34 x 24 mm (Bent 1921).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The distinctive black head and underbody, with gray wings, back, and tail easily distinguishes this species from any other tern species. Their size is also a key to recognition. They are very small compared to other tern species in the state. Only the Interior Least Tern (*Sterna antillarum athalassos*) is of similar size. Color will preclude any misidentification between these two species.

Habitat

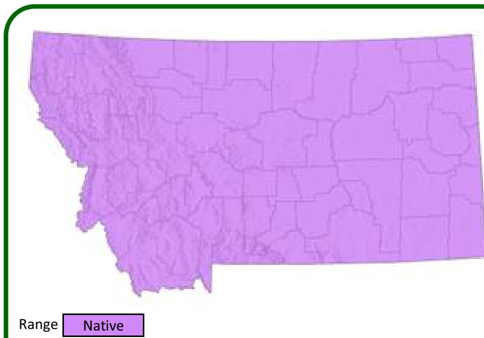
Black Tern breeding habitat in Montana is mostly wetlands, marshes, prairie potholes, and small ponds. However, several locations are on man-made islands or islands in man-made reservoirs. Across all Montana sites where Black Terns are present, approximately 30%-50% of the wetland complex is emergent vegetation. Vegetation within known breeding colonies includes alkali bulrushes, canary reed-grass, cattail spp., sedge spp., rush spp., reed spp., grass spp., *Polygonum* spp., *Juncus* spp. and *Potamogeton* spp., indicating a wide variety of potential habitats are usable by Black Terns. Water levels in known breeding localities range from about 0.5 m to greater than 2.0 m with most having depths between 0.5 m and 1.0 m (Montana Natural Heritage Program Point Observation Database).

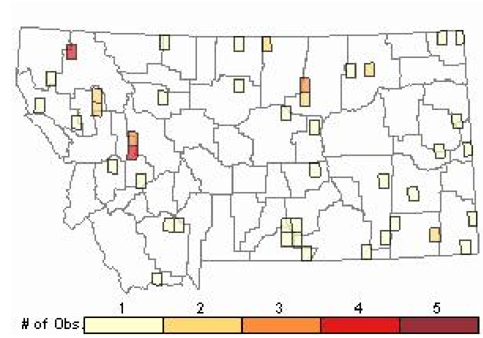
Lance-tipped Darner
Aeshna constricta

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S1S3

Agency Status
USFWS:
USFS:
BLM:





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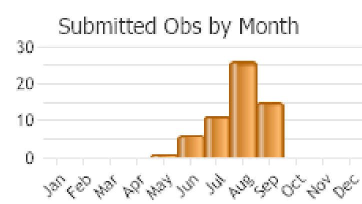


General Description

The Lance-tipped Darner is a member of the family Aeshnidae. Darners are among the largest and fastest-flying North American dragonflies, 2 1/4-4 3/4" (57-120 mm) long. These brilliant blue, green, or brown insects have large, clear wings spanning up to 5 7/8". Their compound eyes meet on top of the head. The female hovers above water usually attached or guarded by the male and, using a well-developed ovipositor for slicing into emergent plants, thrusts eggs one at a time in the stems. Preferred habitat includes open, shallow marshy ponds, including some that are temporary, as well as the edges of larger open lakes, bogs, and slow streams. Wetland systems: Western Emergent Marsh, Northern Rocky Mountain Wooded Vernal Pool and the Rocky Mountain Subalpine-Montane Fen, Great Plains Open Freshwater Depressional Wetland, Great Plains Prairie Pothole

Habitat

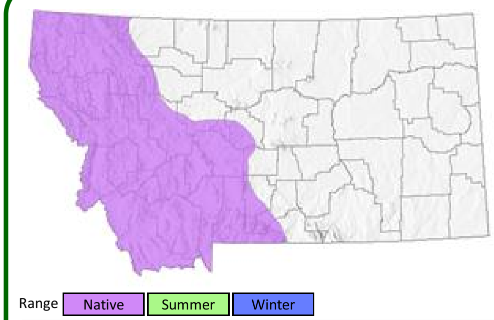
Lance-tipped Darners inhabit open, shallow marshy ponds, including some that are temporary, as well as the edges of larger open lakes, bogs, and slow streams. Many of the ponds selected for breeding dry up during the year (Dunkle 2000, Paulson 2009). They hunt, often in swarms, over marshes and fields and tend to perch vertically on low vegetation and shrubs, but will also perch on trees and branches (Dunkle 2000, Paulson 2009).

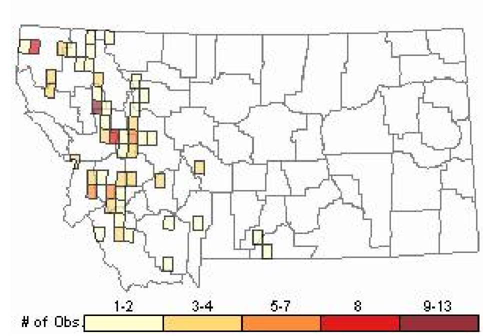
Lake Darner
Aeshna eremita

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S4

Agency Status
USFWS:
USFS:
BLM:





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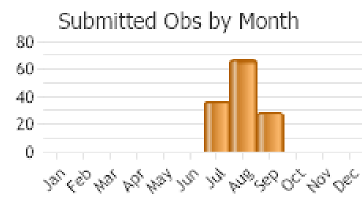


General Description

The Lake Darner is a member of the family Aeshnidae. Darners are among the largest and fastest-flying North American dragonflies, 2 1/4-4 3/4" long. These brilliant blue, green, or brown insects have large, clear wings spanning up to 5 7/8". Their compound eyes meet on top of the head. The female hovers above water usually attached or guarded by the male and, using a well-developed ovipositor for slicing into emergent plants, thrusts eggs one at a time in the stems. Preferred habitat is sparsely vegetated or woody lakes and ponds, as well as marshes, fens, bogs and slow-flowing streams. Wetland systems: Western Emergent Marsh, Northern Rocky Mountain Wooded Vernal Pool and the Rocky Mountain Subalpine-Montane Fen.

Habitat

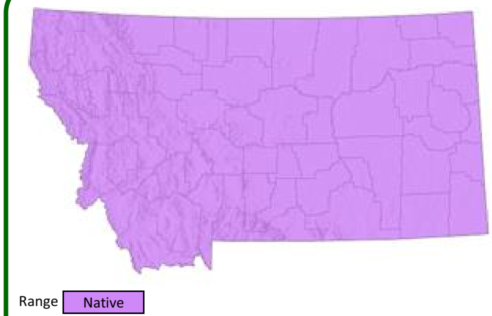
Lake Darners prefer sparsely vegetated or woody lakes and ponds, as well as marshes, fens, bogs and slow-flowing streams. They feed at forest openings and will perch on trees, branches and sometimes on the ground (Dunkle 2000, Paulson 2009).

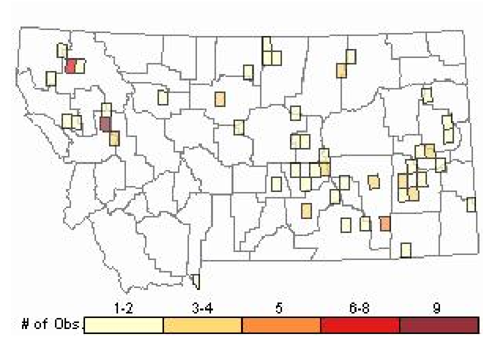
Emma's Dancer
Argia emma

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S5

Agency Status
USFWS:
USFS:
BLM:





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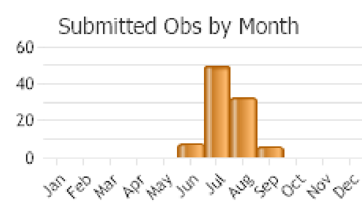


General Description

Information on this species is incomplete.

Habitat

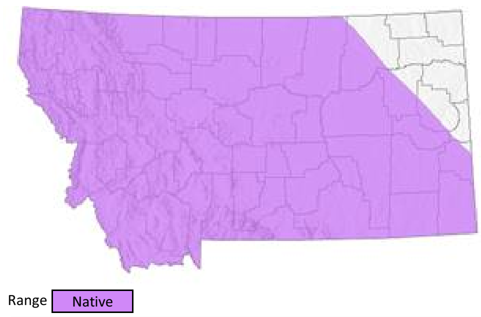
Emma's Dancers occur in rapid rocky mountain streams and moderate to large rivers with sandy or mud substrates and open or shrubby banks, as well as large lakes with open rocky shores in forested and open landscapes (Westfall and May 1996; Paulson 2009). Miller and Gustafson (1996) have reported them as abundant in cool springs as well.
Larvae Emma's Dancers are apparently difficult to collect as they occupy the entire streambed and are quick to scatter when disturbed (Westfall and May 1996).

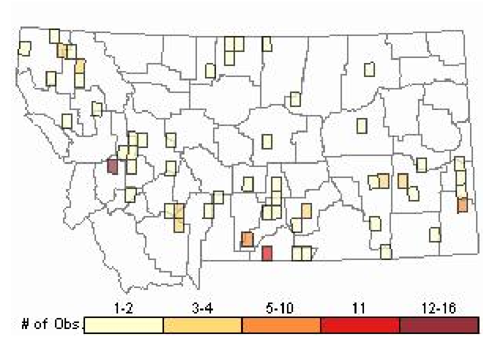
Blue-eyed Darner
Rhionaeschna multicolor

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S2S4

Agency Status
USFWS:
USFS:
BLM:





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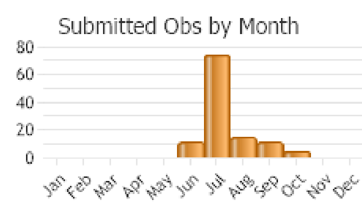


General Description

Information on this species is incomplete.

Habitat

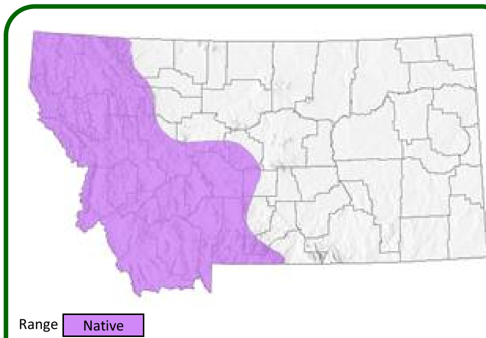
The habitat of Blue-eyed Darners includes lakes, ponds, marshes, and slow streams with edge vegetation, as well as acid bogs. This species can also tolerate alkaline water conditions (Dunkle 2000, Nikula et al. 2002, Paulson 2009).

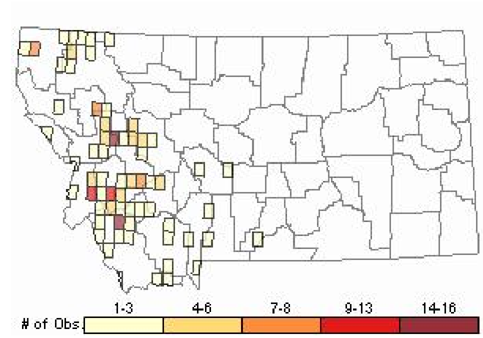
Mountain Emerald
Somatochlora semicircularis

[View in Field Guide](#)

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S5

Agency Status
USFWS:
USFS:
BLM:





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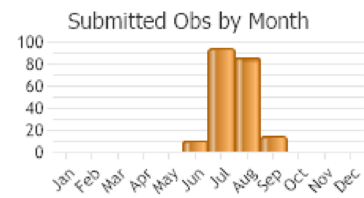


General Description

Information on this species is incomplete.

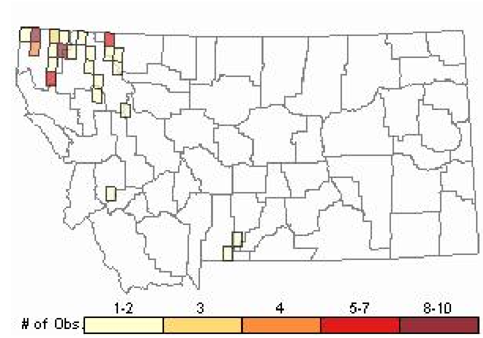
Habitat

The preferred habitat of the Mountain Emerald includes ponds, marshes, fens, bogs and swamps, as well as wet meadows associated with small streams. This species tends to avoid lakes unless an extensive sedge margin is present (Dunkle 2000, Nikula et al. 2002, Paulson 2009).

Upward-lobed Moonwort
Botrychium ascendens [View in Field Guide](#)

Species of Concern
Native Species
Global Rank: G3
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 4
C-value: 4



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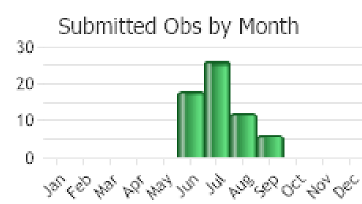


General Description

Upward-lobed Moonwort is a small, perennial fern with a single aboveground frond. The frond is usually about 10 cm tall, yellow-green, and divided into two segments which share a common stalk. The mostly sterile segment is once pinnatifid with up to six pairs of strongly ascending, narrowly triangular pinnae which have deeply lacerate margins. The sterile segment often has a few sporangia on the margins of the pinnae or on small branches. The fertile segment is longer than the sterile segment, is branched, and bears grape-like sporangia. Spores germinate underground and develop into minute, subterranean, non-photosynthetic gametophytes which depend on an endophytic fungus for nourishment.

Phenology

Frond maturing in June-July.

Diagnostic Characteristics

Strongly ascending pinnae with lacerate margins and a yellow-green color are diagnostic of *B. ascendens*. It may be easily confused with *B. crenulatum, B. minganense*, and *B. montanum*. Reliable field determination of moonworts depends on the careful use of technical keys and on comparison with silhouette outlines of verified specimens. Identification can be complicated because there is often a high degree of morphological variability between individuals in a population and between populations of the same species; several species may grow together at the same site. Also, the few diagnostic characters may not be apparent in small plants.

Habitat

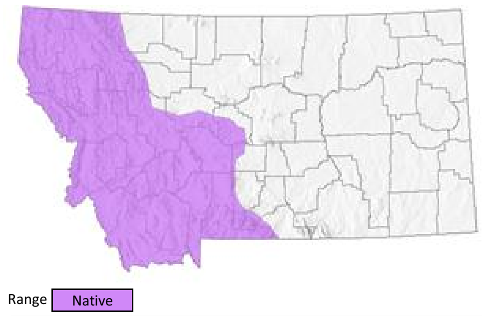
Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats.

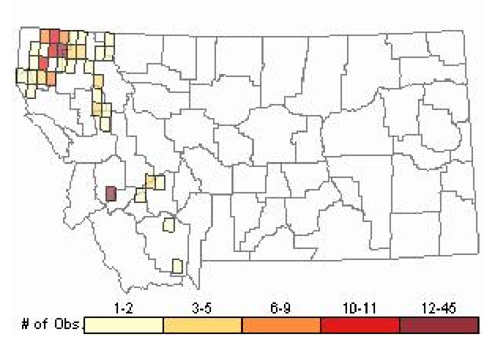
Wavy Moonwort
Botrychium crenulatum

View in Field Guide

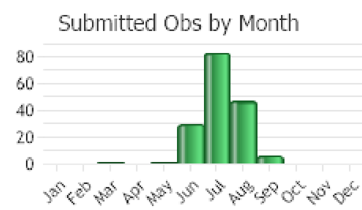
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 4
C-value: 4





 # Observations: 171



General Description

Wavy Moonwort is a small, perennial fern with a single aboveground frond. The frond is usually 10 cm or less tall, yellow-green, and divided into two segments which share a common stalk. The mostly sterile segment is once pinnatifid with usually three or four well separated pairs of thin textured, broadly fan-shaped pinnae which have distinct veins and crenulate margins. The fertile segment is longer than the sterile segment, is branched (often like a tiny Christmas tree), and bears grape-like sporangia. Spores germinate underground and develop into minute, subterranean, non-photosynthetic gametophytes which depend on an endophytic fungus for nourishment.

Phenology

Fronds mature in June-July.

Diagnostic Characteristics

Yellow-green color and well separated, thin textured, broadly fan-shaped pinnae with crenulate margins and prominent veins are diagnostic of *B. crenulatum*. It may be easily confused with *B. ascendens, B. lunaria* and *B. minganense*. Reliable field determination of moonworts depends on the careful use of technical keys and comparison with silhouette outlines of verified specimens. Identification can be complicated because there is often a high degree of morphological variability between individuals in a population and between populations of the same species; several species may grow together at the same site, and the few diagnostic characters may not be apparent in small plants.

Habitat

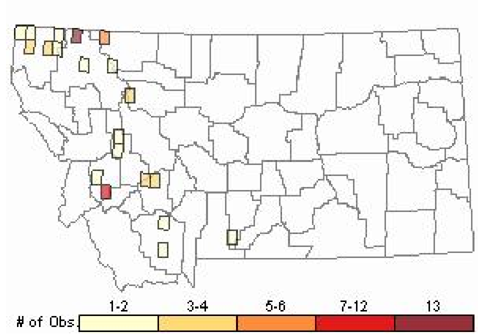
Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats. Sites may be partially shaded or open.

Peculiar Moonwort
Botrychium paradoxum

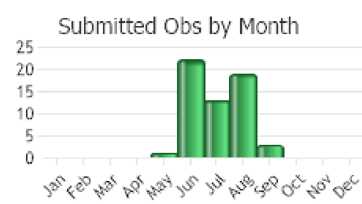
View in Field Guide

Species of Concern
Native Species
Global Rank: G3G4
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
MNPS Threat Rank: 4
C-value:



 # Observations: 61



General Description

Peculiar moonwort is a small perennial fern with a single above ground frond. The frond varies in height up to about 15 cm tall, is glaucous green, somewhat succulent, and divided into two similar segments which share a common stalk. The segments may be unbranched in small plants or branched in larger plants and are both fertile and bear grape-like sporangia. Spores germinate underground and develop into minute, subterranean, non-photosynthetic gametophytes which depend on an endophytic fungus for nourishment.

Phenology

Fronds mature in July.

Diagnostic Characteristics

Botrychium paradoxum is perhaps the easiest of moonworts to recognize, being the only species to lack a sterile laminar frond segment, but other species could be mistaken for it if the sterile segment has been browsed or bears marginal sporangia. Reliable field determination of moonworts depends on the careful use of technical keys and comparison with silhouette outlines of verified specimens. It is complicated because there is often a high degree of morphological variability between individuals in a population and between populations of the same species, several species may grow together at the same site, and the few diagnostic characters may not be apparent in small plants.

Habitat

Mesic meadows associated with spruce and lodgepole pine forests in the montane and subalpine zones; also found in springy western red cedar forests.

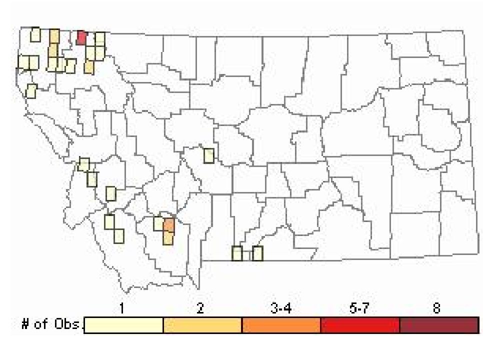
Least Moonwort

Botrychium simplex

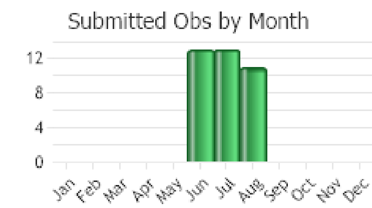
View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 4
C-value: 6



 # Observations: 38



General Description

Trophophore light green, lanceolate, to 5 cm long with up to 7 pairs of ascending, fan-shaped pinnae with wavy margins; the lowest often deeply divided and overlapping the ones above. Sporophore 1 to 2 times pinnate, 1 to 8 times length of trophophore (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Phenology

Leaves appearing in midspring to early fall.

Habitat

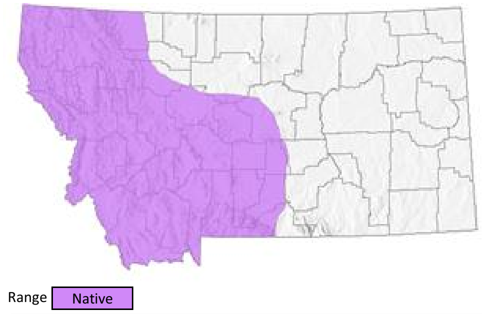
Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats. Sites are generally open with montane meadows and grasslands being the most common habitats occupied by the species.

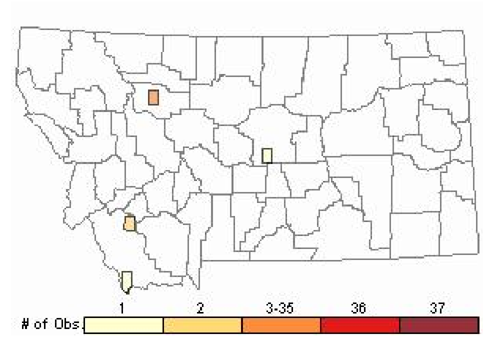
Low Braya
Braya humilis

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 6





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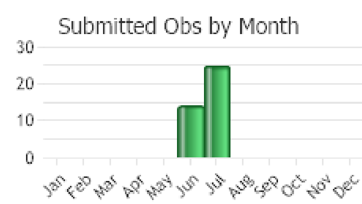


General Description

Plants: Braya is a short-lived perennial with 1 to several erect to prostrate stems, 3-20 cm long, which arise from a simple or branched rootcrown and taproot.

Leaves: The numerous basal leaves are lance-shaped and 1-3 cm long with entire or toothed margins. The widely spaced stem leaves are alternate and smaller. Foliage is sparsely to densely covered with simple and branched hairs.

Flowers: Borne on short stalks in terminal clusters that expand as the fruit matures. Each flower has 4 white petals, which are 3-4 mm long, 4 sepals, 4 long stamens, and 2 short stamens.

Fruit: The erect or spreading linear fruits (siliques) are puberulent (Lesica 2012), ca 1-3 cm in length, 0.6-2 mm in width, and typically straight, but occasionally torulose (constricting between the seeds) (FNA 2010).

Phenology

Flowering from mid-June at lower elevation sites to late July in alpine settings.

Habitat

Sparsely vegetated, vernally moist, calcareous soil in the alpine zone and similar sites with sparse vegetation cover dominated by *Potentilla fruticosa*, *Carex scirpoidea*, *Phlox kelsey* and *Zigadenus elegans* in montane settings along the Rocky Mtn Front.

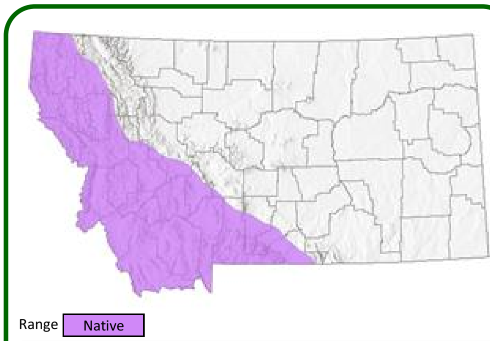
Hutchinsia

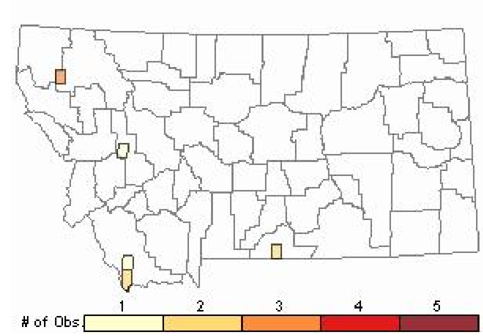
Hornungia procumbens

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S2

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 4





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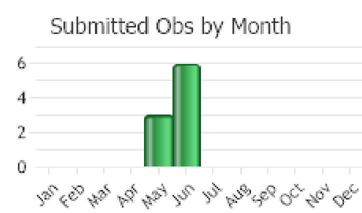


General Description

Hornungia procumbens is an annual with branched, erect stems that are 2-10 cm high. Alternate, narrowly lance-shaped leaves, 5-20 mm long with entire margins or a pair of basal lobes, are largest at the base of the plant. Foliage is glabrous. Numerous tiny, stalked flowers are borne at the top of the stems in a spreading, elongate inflorescence. Each flower has 4 white, separate petals that are ca. 1 mm long, which fall shortly after opening. The glabrous, egg-shaped fruits, or siliques, are 3-5 mm long and borne on spreading stalks that are up to 10 mm long.

Phenology

Flowering in June, mature fruit in July.

Diagnostic Characteristics

The lack of a basal rosette separates *Hornungia* from *Draba*. *Lepidium*, *Thlaspi* and *Alyssum* have fruits that are notched or flattened on top. Small mustards such as *Hornungia* may be difficult to identify. A technical manual should be consulted, and a hand lens may be required.

Habitat

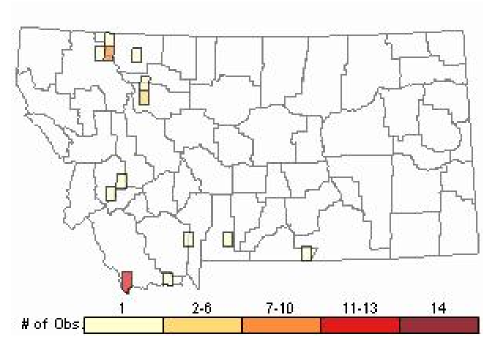
Vernally moist, alkaline soil of sagebrush steppe in the valley to lower montane zones.

Simple Kobresia
Kobresia simpliciuscula

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 9



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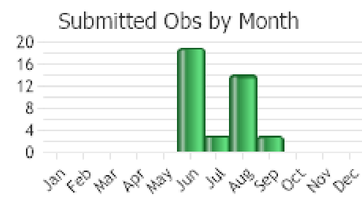


General Description

Stems 5–20 cm. Leaves flat, 1–2 mm wide. Inflorescence of several aggregated spikes 3–6 mm long; bracts 3–4 mm long. Spikelets: upper male, 1-flowered; lower female or bisexual, 1- or 2-flowered. Perigynia brown, 2.5–3 mm long. Achenes ca. 3 mm long (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Phenology

Mature fruit in late July-August.

Diagnostic Characteristics

This species could easily be mistaken for a true sedge (*Carex*), but is distinguished by having a bract wrapped around the ovary, rather than a closed perigynium. *Kobresia myosuroides* , which can occur in the same habitat, is distinguished by having a solitary spike rather than multiple spikes.

Habitat

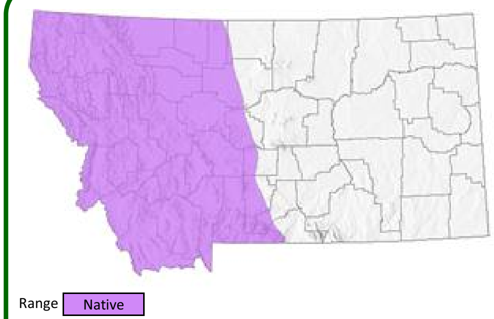
Montane fens to moist tundra in the alpine zone.

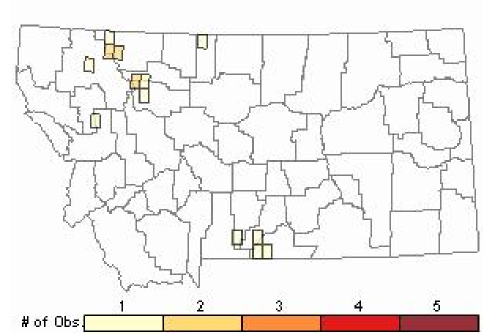
Northern Buttercup
Ranunculus pedatifidus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 9





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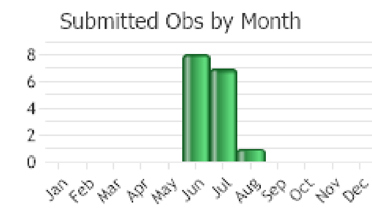


General Description

Northern Buttercup is an herbaceous perennial with fibrous roots and 1 to several erect stems that are 1-3 dm high. Each basal leaf has a petiole that is 3-8 cm long and a spade-shaped blade that is 5-12 cm long and deeply palmately lobed. The few stem leaves have 5-7 linear lobes and become sessile upward. Foliage is sparsely to densely covered with long hair. The 1 to several long-stalked flowers have 5 spreading, hairy sepals that are 5-6 mm long, and the 5 yellow petals are 8-10 mm long. The 25-80 finely short-hairy to glabrous achenes are 2 mm long have a curved beak that is 1 mm long, and are borne in an egg-shaped cluster.

Phenology

Flowering in June-August.

Diagnostic Characteristics

Ranunculus is a large genus; a technical manual should be consulted for identification. *R. verecundus* has smaller petals than *R. pedatifidus*, and the leaf margins of *R. cardiophyllus* are merely toothed.

Habitat

Moist meadows and open woodlands in the montane to alpine zones.

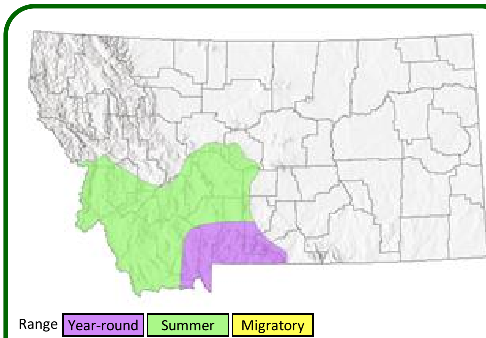
Montana Natural Heritage Program

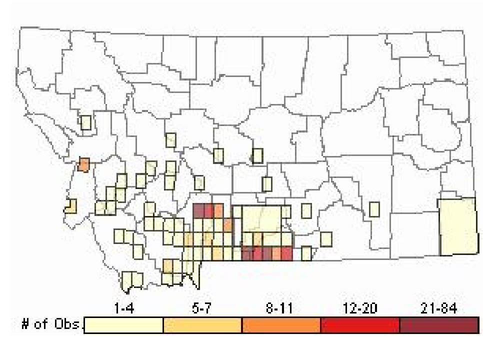
Black Rosy-Finch
Leucosticte atrata

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S2

Agency Status
USFWS: MBTA; BCC10
USFS:
BLM:
FWP SWAP: SGCN2, SGIN
PIF: 2





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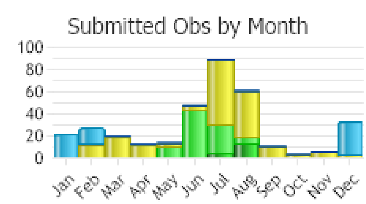


General Description

The Black Rosy-Finch is a medium-sized, slightly stocky finch of about 14 to 16 cm in length and 22 to 32 grams in weight, with a medium-sized bill for eating seeds. The sexes are similar in size and coloration, but the male plumage contrasts more and is more colorful. Males are a uniform dark brownish-black on the back, breast, neck, and face below the eye. The feathers of the belly, rump, upper- and under-tail coverts, and the bend of the wing (wrist) are broadly tipped with pink (more narrowly and reddish in summer). The forecrown is black; there is a silver-gray band around the hindcrown. The nasal tufts are white, and the tail is notched. The bill is yellow in winter and black during the breeding season. The legs are black and the under wings appear silvery during flight. Females are similar but with the body a lighter grayish-brown, the back more streaked, and the pink feathers reduced or absent; the gray on the hindcrown is often absent by midsummer. Juveniles are similar in appearance to females, but lighter (usually more gray-brown), and lacking the silver-gray hindcrown, black forehead, and pink on the feather margins (Johnson 2002).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Black Rosy-Finch is most likely to be confused only with other rosy-finches. The Gray-crowned Rosy-Finch is much lighter and brownish overall, with more extensive pink to red feather margins that contrast less with the brown plumage. The Brown-capped Rosy-Finch lacks the silver-gray on the head and is much lighter and browner-bodied (almost golden in males). Ranges of the three species rarely overlap during the breeding season (Johnson 2002).

Habitat

Habitat use in Montana has not been studied, but is similar to other regions (P. Hendricks, personal observation), where Black Rosy-Finches are known to nest in crevices in cliffs and talus among glaciers and snowfields above timberline (also possibly in abandoned buildings above treeline) and forage in barren, rocky or grassy areas adjacent to the nesting sites; in migration and winter they also occur in open situations, fields, cultivated lands, brushy areas, and around human habitation (American Ornithologists' Union 1983, Johnson 2002). They may roost in mine shafts or similar protected sites. During some winters individuals move out onto the shortgrass and midgrass prairies to feed (Hendricks and Swenson 1983, Johnson 2002).

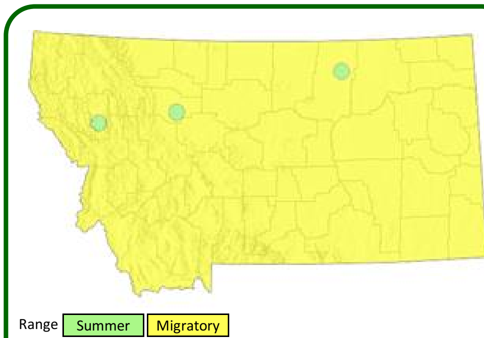
Clark's Grebe

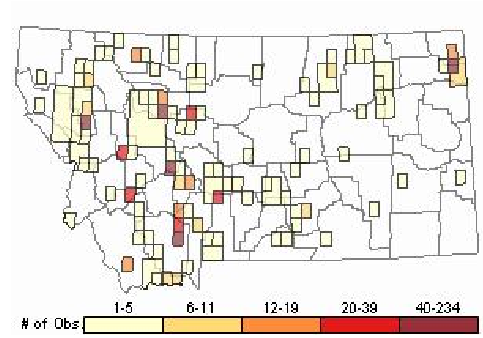
Aechmophorus clarkii

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA; BCC10; BCC11
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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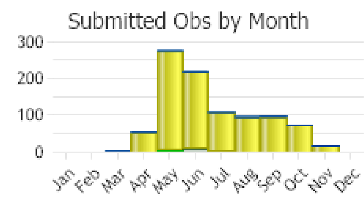


General Description

Sexes similar in size and plumage. Clark's Grebe possesses a black crown, yellow bill, a narrow body with a long and thin white neck; back of neck gray. Top of body is mostly gray with speckled white spots. Coverts white with speckled gray.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Clarks Grebe best distinguished from the Western Grebe by having white up the side of the head to include the eye (the black crown of Western Grebe extends down the side of the head to include the eye) and a yellow bill (not yellowish-green).

Habitat

Clark's Grebes are reported breeding only at very large lakes and reservoirs in Montana.

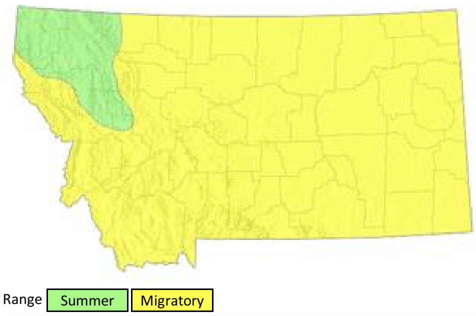
Montana Natural Heritage Program

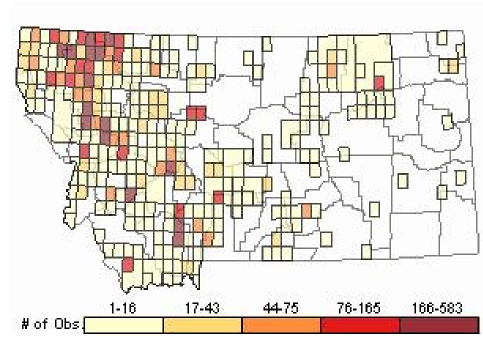
Common Loon
Gavia immer

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS: SENSITIVE
BLM:
FWP SWAP: SGCN3
PIF: 1





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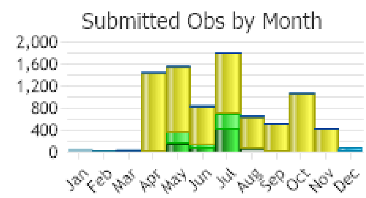


General Description

The Common Loon is a large and mainly aquatic bird. Males are generally larger than females. Adult body length ranges from 71 to 92 cm (28 to 36 inches) with wingspans to 147 cm (58 inches). Weight varies ranging from 1.6 to 8 kg (3.5 to 17.6 lb.) with an average of about 3 to 4 kg (6.6 to 8.8 lb.) (McIntyre 1988, McIntyre and Barr 1997). The feet are located far back on the body and are large, webbed, and sweep to the side rather than forward under the belly. This trait makes it difficult for Common Loons to walk on land but allows more efficient swimming underwater.

Sexes are indistinguishable based on plumage. The head and neck of breeding adults are black with a green gloss. The back, wings and sides are also black. Scapulars and wing-coverts have large white markings, which is a distinctive field mark. The eye is red. Common Loons have a broad patch of vertical white stripes on the side of the neck and a smaller patch on the upper foreneck. The breast and belly are white and the bill is straight, heavy and black (McIntyre and Barr 1997). In the non-breeding plumage, the head, neck and upper parts are dark gray to dark brown. The cheeks, throat, and underparts are white. The bill is brownish-gray to pale bluish-gray or horn colored. The iris is brown. The tail is dark brown, tipped with white (Bent 1919, Johnsgard 1987, McIntyre 1986, 1988). Juvenile plumage is similar to the adult non-breeding plumage, although the upperparts have the most pale and more conspicuous feather margins than those of adults, and the throat and sides of the neck are more finely streaked with brown. This plumage is worn until the following summer when the birds molt into more adult-like basic plumage (Palmer 1962, McIntyre 1988).

Common Loons are known for their distinctive calls, three of which are heard on summer breeding lakes. The wail, a long almost mournful cry, the tremolo, a high pitched, rapid, five-beat call, and probably the best known is the yodel which is given only by males during territorial confrontations. Common Loons generally lay 2 subelliptical to ovoid shaped eggs which vary from deep olive to light brown in color, with irregular dark brown or black spots.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The Common Loon is a large loon with a heavy, black bill and an easily recognizable breeding plumage. The large size of the Common Loon distinguishes it from the Pacific Loon (*G. pacifica*) and the Red-throated Loon (*G. stellata*), as well as the Arctic Loon (*G. arctica*), which has never occurred in Montana. Only the Yellow-billed Loon (*G. adamsii*) is comparable in size. It, however, has a distinctive yellow bill as well as subtle differences in plumage (McIntyre and Barr 1997).

Habitat

In Montana, Common Loons will not generally nest on lakes less than about 13 acres in size or over 5000 feet in elevation (Skaar 1990). Successful nesting requires both nesting sites and nursery areas. Small islands are preferred for nesting, but herbaceous shoreline areas, especially promontories, are also selected. Nursery areas are very often sheltered, shallow coves with abundant small fish and insects (Skaar 1990). Most Montana lakes inhabited by Common Loons are relatively oligotrophic and have not experienced significant siltation or other hydrological changes.

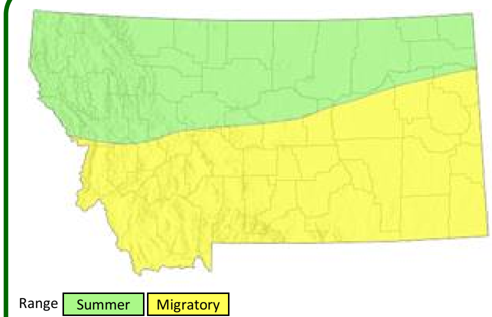
The quantity and quality of nesting habitat limits the Common Loon population of northwest Montana. Skaar (1990) estimated the state's "carrying capacity" at 185 potential nesting territories, based on the size and number of lakes within the species' breeding distribution. He assumed 100 ha of surface area per pair. Kelly (1992) documented a density of 72.2 surface ha of water per adult Common Loon for the Tobacco, Stillwater, Clearwater, and Swan River drainages.

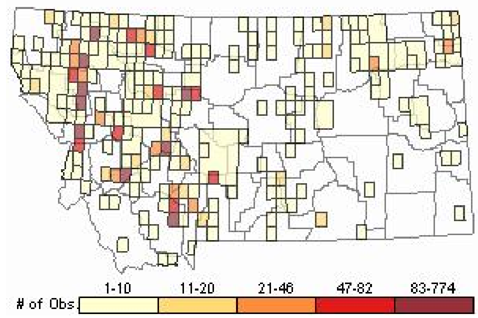
Horned Grebe
Podiceps auritus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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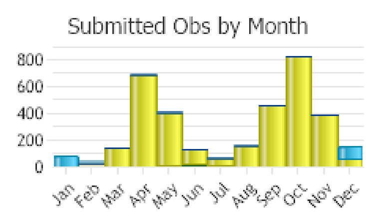


General Description

Nonbreeding plumage (September-March) is black and white. The head is topped with a gray crown bordering on white cheeks; this border extending in a rather straight line from behind the eyes. The front of the neck, flanks and belly are dingy white. In breeding plumage, the neck and flanks are ruddy in color, the crown and cheeks are black and a stripe of white to gold feathers extends back from the eye.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Most easily confused with the Eared Grebe, but differs from this species by having the forehead rise to a peak at the rear of the crown rather than in the middle (as with the Eared), a thicker neck and thicker bill with the lower mandible lacking an up-turned tip (all features of Eared Grebes), and a less rounded back without the fluffier rear-end. Eared Grebe also lacks the whitish patch at the base of the forewing that are visible in flight.

Habitat

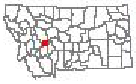
Horned Grebes use shallow freshwater ponds and marshes with beds of emergent vegetation (especially sedges, rushes and cattails), including in Montana (Dubois 1919, Weydemeyer 1932). In spring and fall the Horned Grebe is found mainly on large sized bodies of water, including rivers and small lakes. The winter range consists of large sized bodies of fresh and more commonly salt water; usually inshore (Stedman 2000).

MONTANA
Natural Heritage Program

1515 East 6th Avenue
Helena, MT 59620
(406) 444-5363
mtnhp.org

Invasive and Pest Species

from Environmental Summary



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Summarized by: 010N003W035 (Buffered PLSS Section)

Suggested Citation: Montana Natural Heritage Program. Environmental Summary Report. Custom Field Guide. Summarized by: 010N003W035 (Buffered PLSS Section). Retrieved on 6/23/2022.

Offline Field Guide

Note: This PDF version of the Montana Field Guide is intended to assist in offline identification and field work. It is not intended to replace the online Field Guide, as that version contains more information and is updated daily. For the most up-to-date information on Montana species, please visit **FieldGuide.mt.gov**

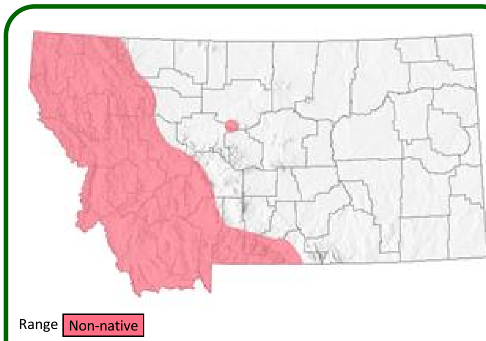
Montana Field Guide

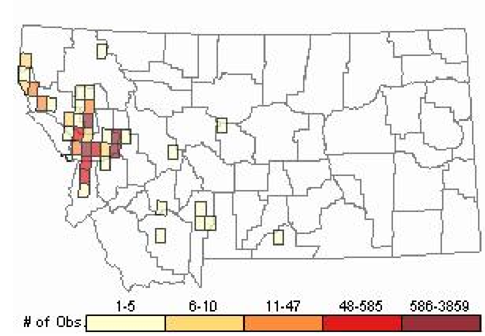
Yellowflag Iris
Iris pseudacorus

View in Field Guide

Noxious Weed: Priority 2A
Aquatic Invasive Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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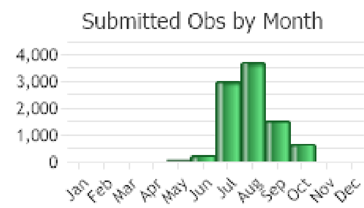


General Description

PLANTS: Herbaceous perennials that grow from 1 to 1.5 meters tall with showy flowers and thick rhizomes (DiTomaso and Healy 2003). Stems are clumped (Lesica 2012). Rhizomes are up to 5 inches wide, have black sap, and produce roots that range from 4 to 12 inches long (Jacobs et al. 2011).

LEAVES: Each plant has up to several equitant leaves that fold in half length-wise and enclose the base of the next higher leaf (Jacobs et al. 2011; Lesica 2012). Thus, leaves emerge from the ground resembling a spreading fan (Jacobs et al. 2011). Each leaf resembles a sword's tip, and is from 50-100 cm (20-40 inches) tall and 10-30 cm (0.4-1.2 inches) wide.

INFLORESCENCE: An erect raceme of 3-10 yellow flowers, that branches in its upper portion (Lescia 2012). Bracts (spathes) are leaf-like, 4-7 cm long, and enfold the stem; the outer are keeled (Lesica 2012).

The genus name "Iris" is derived from Iris, the greek goddess of the rainbow and messenger to the gods (Ramey and Peichel 2001). The specific epithet name "pseudacorus" means false (pseud) sweet flag (Acorus) referring to the similarity with the genus Acorus (Ramey and Peichel 2001).

Phenology

Flowers bloom from May to July, and are pollinated by insects. Seeds are produced between July and October. Germination primarily occurs the following spring.

Diagnostic Characteristics

Montana has two *Iris* species: Rocky Mountain Iris (*Iris missouriensis*) and Yellowflag. The native Rocky Mountain Iris has a similar appearance, but develops 1-3 blue flowers and Yellowflag Iris has 3-10 yellow flowers. Both iris species occupy similar habitats. Rocky Mountain Iris grows in moist to wet meadows and irrigation ditches, but can tolerate drier conditions (thickets and woodlands). Yellowflag Iris requires moist to wetter habitats. In addition, Rocky Mountain Iris plants tend to be shorter (10-50 cm), have shorter (10-40 cm) and narrower (3-8 mm) leaves, and their rhizomes lack the black sap (Jacobs et al. 2011; Lesica 2012).

Cattail (Typha latifolia and T. angustifolia) leaves sheath at the base and appear similar when young, but their stems are round (not flattened).

Habitat

Disturbed wetland habitats: marshes, wet meadows, irrigation ditches, pond margins, and riparian areas in the valleys (Lesica 2012).

Management

Montana's Yellowflag Iris Task Force is led by Jed Little who can be contacted at: (406) 258-4220 or mapping@missoulaeduplace.org

Yellowflag Iris was introduced to North America as a horticultural plant. Many cultivars of this species have been developed (Tu 2003). Because of its growth form, Yellowflag Iris has been planted for erosion control and in sewage treatment ponds (Tu 2003). It has been used to collect sediment and to remove copper and iron heavy metals from wastewater (Tu 2003).

PREVENTION
It is a beautiful plant that will continue to be spread by gardeners, garden dealers, and sales on the internet until the sale of the species is banned. Preventing new infestations is the best means for controlling the plant. It is difficult to eradicate because it reproduces vegetatively and by seed, is adaptable to a wide range of moisture and soil conditions, and has few pests or predators (Tu 2003).

CHEMICAL CONTROL [Adapted from Tu 2003.]
Herbicides are effective at controlling populations. However, the type of herbicide, herbicide concentration, timing of chemical control, and other factors will determine its effectiveness. Always wear protective clothing designed for chemicals, follow chemical label instructions, and use restrictions. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Because it grows in or adjacent to water, an aquatic-labelled herbicide and adjuvant must be used. Glyphosate, under the trade names of Rodeo®, Aquamaster® or Glypro®, has been used successfully to kill Yellowflag Iris; however, plants are resistant to Terbutryne. Use Glyphosate in a 25 percent solution (13 percent a.i.) with a dripless wick/wiper applicator, or spray it using a 5-8 percent solution, and in combination with the appropriate non-ionic surfactant adjuvant. It is recommended to use a dye to better track sprays. The herbicide can be applied directly to leaves or to freshly cut leaves/stems. Spot-treat plants and do not broadcast spray in order to protect other native plants, animals, and water quality.

MECHANICAL CONTROL [Adapted from Tu 2003.]
Mechanical control is labor-intensive, but new or small patches can be controlled by physically removing the entire plant. It is essential to remove the entire rhizome, since small pieces of rhizome can re-sprout. Protective gear should be worn since resinous substances in the leaves and rhizomes can irritate the skin.

Mowing can provide control if done annually, but it will not remove the plant. Likewise, removing the flowers/fruits (dead-heading) will reduce its ability to spread, but will not kill the plant. Plants are poisonous if ingested by grazing animals.

BIOLOGICAL CONTROL [Adapted from Tu 2003.]
There are no known biological controls available for Yellowflag Iris. Many invertebrates and fungi do feed upon iris, and specific species are listed in the document, Element Stewardship Abstract for Iris pseudacorus L. by Mandy Tu of The Nature Conservancy (2003). In addition, the iris root rot called Pseudomonas iridis causes leaves to yellow and rhizomes to rot. However, none of these insects, fungi, or pathogen significantly kill plants or control populations.

CULTURAL [Adapted from Tu 2003.]
Prescribed fire is not recommended for controlling Yellowflag Iris. Plants grow in wet environments which are often poorly affected by fire and where other native plants are not adapted to fire. Rhizomes can re-sprout in response to low-severity fires.

Contact information for local county Weed District Coordinators can be found on the Montana Weed Control Association Contacts Webpage.

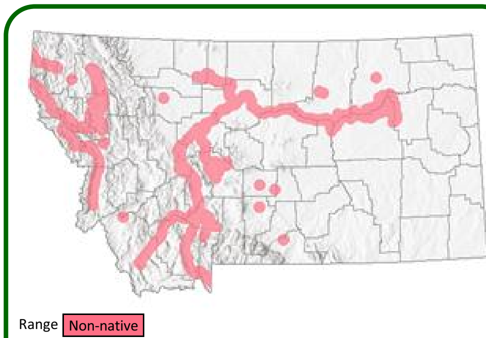
Contact information for Aquatic Invasive Species personnel:
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

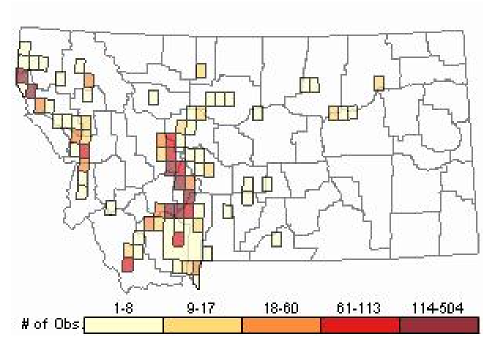
Curly-leaf Pondweed
Potamogeton crispus

View in Field Guide

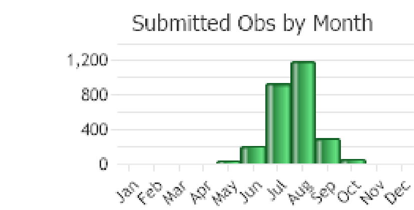
Noxious Weed: Priority 2B
Aquatic Invasive Species
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





 # Observations: 3381



General Description

PLANTS: Aquatic perennials that produce turions (starch-containing stem buds), terminal on a stem or in leaf axils. Stems are flat and alternately branched. Sources: Parkinson et al. 2016; Lesica 2012; Haynes and Hellquist *in* Flora of North America (FNA) 2000).

LEAVES: All leaves are submersed; true-floating leaves are absent. Leaves are alternately arranged, fairly stiff, and range in color from red-brown to olive-green. Leaves are linear-oblong (3–8 cm × 4–10 mm) with serrate, wavy margins and a sessile, clasping base. Leaf tips are rounded. Stipules are 3–7 mm long and shred early. Sources: Parkinson et al. 2016; Lesica 2012; Haynes and Hellquist *in* Flora of North America (FNA) 2000).

INFLORESCENCE: Emersed spikes of 1–2 cm long, continuous, and composed of inconspicuous flowers (Lesica 2012, Parkinson et al. 2016).

Phenology

Inflorescence develops in early summer. Turions germinate in fall, grow shoots and roots in late winter to early spring, and go dormant in mid-summer to fall.

Diagnostic Characteristics

For positive species identification, all members of Potamogeton should be collected in fruit. Montana has more than 20 species of pondweeds, and users of this field guide are encouraged to identify specimens using the Manual of Montana Vascular Plants (Lesica 2012).

The combination of slightly flattened stems and submersed leaves with wavy margins (resembling a lasagna noodle) that are also minutely toothed and clasp the stem distinguishes Curly-leaf Pondweed. Young leaves may lack wavy margins. Leaf shape is also linear to oblong. Turions are present in fall and winter (DiTomaso and Healy 2003).

Richardson's Pondweed (*Potamogeton richardsonii*) also has alternately arranged leaves that clasp the stem and have wavy leaf margins, but margins lack teeth (entire), leaf tips are pointed, and leaf shape is lanceolate to ovate (Parkinson et al. 2016). The stems are round with little branching.

White-stemmed Pondweed (*Potamogeton praelongus*) also has alternately arranged leaves that clasp the stem and have minutely wavy leaf margins, but margins lack teeth (entire), leaf tips are pointed, and some leaves are greater than 10cm long (Parkinson et al. 2016). The stems are round and zig-zag, and there is little branching.

Habitat

Shallow to deep (18 feet), fresh or saline water of ponds, lakes, and slow streams in the plains and valleys (Lesica 2012; Parkinson et al. 2016). It can tolerate a moderate current (Parkinson et al. 2016). It is typically found at depths from 3.2 to 10 feet. It grows best in alkaline, calcareous water (Parkinson et al. 2016). Substrates range from sandy to hard bottoms; it grows best on substrates that contain 10-25% organic matter and are not too coarse or too fine (Parkinson et al. 2016).

Management

Curly-leaf Pondweed has been a listed noxious weed in Montana since 2010. Its spread from one water body to another has primarily occurred through plant fragments containing turions that are on boat trailers and recreational equipment (Parkinson et al. 2016).

PREVENTION (adapted from Parkinson et al. 2016)
* Thoroughly rinse any mud and debris from all equipment and wading gear, and drain the water from the boat before leaving access areas. Use boat-washing stations when available.
* Remove all plant fragments from the boat, propeller, and boat trailer.
* Dry boats and equipment for 5 days before transporting them to a new water body.
* Do not dispose aquarium water or plants into water bodies.
* Desiccate plant material and/or dispose by securely sealing in plastic bags and placing in the trash for disposal.
* Learn to identify Curly-leaf Pondweed and report your findings to the Montana Department of Agriculture; Montana Fish, Wildlife and Parks; County Extension agent; or Weed Coordinator.

CHEMICAL CONTROL (adapted from Parkinson et al. 2016)
Diquat (Resard, Weedtrine-D), Endothall (Aquathol, Hydrothol 191), and Fluridone (Sonar A.S, Sonar SRP) have been used to herbicide plants in water bodies. The timing of chemical control, water temperature, and herbicide concentration, and other factors are critical to effectively hinder Curly-leaf Pondweed and reduce negative impacts to native vegetation – see Parkinson et al. 2016, and always follow chemical label instructions and use restrictions. These herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control of Curly-leaf Pondweed. Curly-leaf Pondweed initiates growth prior to the native plants, which can help reduce negative impacts from herbicides on native vegetation. However water temperatures must still be appropriate for the herbicide to work on Curly-leaf Pondweed.

MECHNICAL CONTROL (adapted from Parkinson et al. 2016)
Raking and hand-cutting can be effective for controlling smaller populations of Curly-leaf Pondweed. All plant material should be bagged and desiccated before placing in the trash for disposal. Raking and hand-cutting should be done in spring to early summer to prevent the formation of turions, which will disrupt its life cycle. These methods need to be repeated for many years, and monitored thereafter to ensure the plant does not re-establish. See Parkinson et al. 2016 for further details.

PHYSICAL CONTROL (adapted from Parkinson et al. 2016)
Benthic barriers are mats that are laid down on the floor of the water body around docks and other high-use areas. They prevent light from penetrating and prevent plants from rooting. They are usually effective, but kill all vegetation and are long-lasting.
Drawdowns that lower the water levels in the fall can be effective, but requires extensive planning and permitting, and can hurt non-targeted vegetation and animal life.
Dredging excavates the floor of the water body. This deepens the water body to prevent light penetration. This control can be effective, but requires extensive planning and permitting, and can hurt non-targeted vegetation and animal life.

BIOLOGICAL CONTROL (adapted from Parkinson et al. 2016)
Grass carp have been used in portions of the United States to control Curly-leaf Pondweed. However, these fish feed on other aquatic plants and destroy habitat. They are not legally allowed in Montana.

CULTURAL CONTROL (adapted from Parkinson et al. 2010)
To avoid accidentally introducing non-native plants to surrounding water bodies, never place your water-garden near or allow water to overflow into wetlands, streams, rivers, lakes, or ponds. Non-native water-garden plants should never be dumped into natural water bodies. Before purchasing plants, verify that the plant is not invasive.

<u>Contact information for Aquatic Invasive Species personnel:</u>

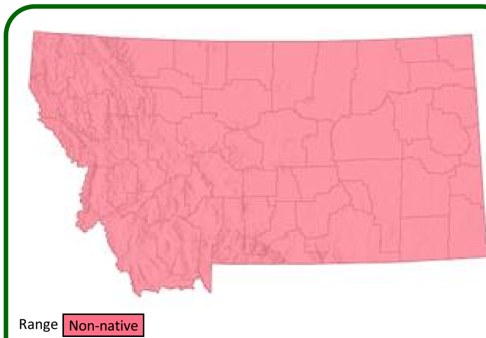
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

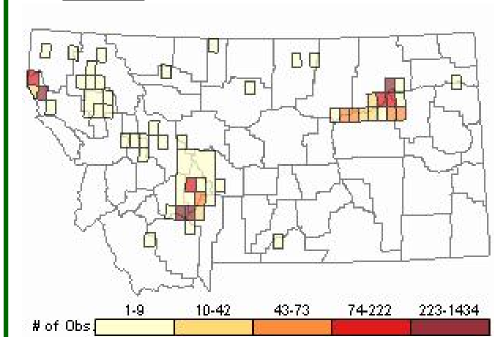
Eurasian Water-milfoil
Myriophyllum spicatum

View in Field Guide

Noxious Weed: Priority 2A
Aquatic Invasive Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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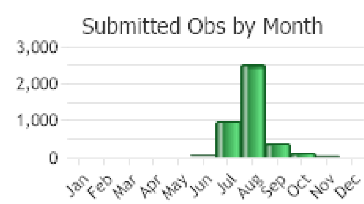


General Description

PLANTS: Aquatic perennials with rhizomes and finely dissected, whorled leaves. Stems are branched and tawny colored when dry. Wintering buds (turions) are absent. Sources: DiTomaso and Healy 2003; Parkinson et al. 2011.

LEAVES: Submerged leaves are well-develop, in whorls of 4 to 5, and to 25 mm long. Each submerged leaf is pinnately divided into 24 to 50 linear segments. Emerged leaves are actually bracts; they are small, grow during flowering (or when water levels recede), occur below the flowers, and are oppositely arranged. Sources: DiTomaso and Healy 2003; Lesica et al. 2012.

INFLORESCENCE: Terminal spike of 4-8 cm long that grows erect above the water (emerged). The spike consists of separate male and female flowers growing in the axils of oppositely arranged leaf-like bracts. Sources: DiTomaso and Healy 2003; DiTomaso and Healy 2003.

Phenology

Flowering in Montana has been observed from July through September.

Diagnostic Characteristics

Montana has 1 exotic and 3 native Water-milfoil species. Their identification requires a close examination and users should consult either the *Manual of Montana Vascular Plants* (Lesica et al. 2012) or *Flora of the Pacific Northwest-2nd Edition* (Giblin et al. [eds] 2018).

Eurasian Water-milfoil - *Myriophyllum spicatum*, exotic, noxious, invasive:
* Combination of flowering spikes with emergent leaves less than 4 mm and whorled submerged leaves with 14 to 24 pairs of segments that ascend.
* Submerged leaves have linear segments that are mostly equal in length.
* Vegetative shoot tips are often dense.
* Plants readily collapse when removed from water.
* Turions (cylinders or balls of small leaves) are absent.

Common Water-milfoil - *Myriophyllum sibiricum*, native, desirable:
* Combination of flowering spikes with emergent leaves less than 4 mm and whorled submerged leaves with 4 to 16 pairs of segments that mostly spread or are perpendicular to the apex.
* Submerged leaves are often in whorls of 4 with 6-16(-24) segments. Segments spread or lay perpendicular to the rachis at base, but may ascend towards the apex.

* Plants remain stiff when removed from water.
* Lower pair of segments are longest and gradually shorten towards the leaf tip.
* Turions present: dark green, broadly cylindrical, composed of reduced and thickened leaves, and may remain persistent on next year's new growth.

Hybrid Eurasian X Common Water-milfoil, exotic, noxious, invasive:
Historically, the relationship of *Myriophyllum spicatum* and *Myriophyllum sibiricum* has been unclear, but recent treatments indicate they are unique species. Where both species are present, the populations can intergrade producing hybrids with intermediate characteristics (DiTomaso and Healy 2003). Genetic testing is necessary when morphological characteristics are in doubt (Thum personal communication). In Montana the hybrid has been found in waterbodies where both species occur and will grow invasively. Hybrids have not been found in water bodies that lack one of these species, indicating they are self-reproducing (Thum personal communication). Herbicides that traditionally control Eurasian Water-milfoil are not effective on hybrid plants (Thum personal communication).

Whorled Water-milfoil - *Myriophyllum verticillatum*, native, desirable:
* Emergent leaves are longer than the flowers and fruits and pinnately divided or lobed more than half-way to mid-vein.
* Flowers have 8 stamens.
* Submerged leaves are generally in whorls of 4, often with 12-22 segments.
* Fruit segments are round(-ish) with shallow, longitudinal ridges and no wings or cross-ribs.
* Turions present (balls of small leaves that develop from tips of vigorous vegetative shoots): brown to red-brown and 1-5 cm long.

Common Hornwort - *Ceratophyllum demersum*, native, desirable:
* Submerged leaves have linear-forked segments that whorl around the stem. They are not pinnately divided (no central mid-rib).
* Flowers are submerged, but usually plants are sterile and reproduction is mostly by overwintering turions (Lesica et al. 2012).

Habitat

Open water of reservoirs; valleys (Lesica 2012). It tolerates moving water and wave action facilitates fragmentation (Parkinson et al. 2011).

Management

Eurasian Water-milfoil spreads primarily through plant fragments on boat trailers, recreational equipment, and waterfowl. It can also disperse between water bodies by wind and water flow. Following introduction, populations expand rapidly and may be undergo cycles of dominance and dieback.

DETECTION [Adapted from Newton et al. 2016]
A traditional polymerase chain reaction (PCR) assay was developed to detect pure and hybridized Eurasian Water-milfoil. In 2013 a pilot study tested its use in the laboratory and at four sites in Jefferson Slough, Jefferson County, Montana and Half Moon Lake, Michigan. Results showed that the environmental DNA (eDNA) PCR assay was able to detect both pure and hybridized Eurasian Water-milfoil. The research recommended that further studies to refine the sensitivity of the assay be conducted. The technique of using eDNA for early detection of Eurasian Water-milfoil is possible.

PREVENTION [Adapted from Parkinson et al. 2011]
* Thoroughly rinse any mud and debris from all equipment and wading gear, and drain the water from the boat before leaving access areas. Pump the bilge before entering another water body as Eurasian Water-milfoil can remain alive in bilge water for several days. Use boat-washing stations when available.
* Remove all plant fragments from the boat, propeller, and boat trailer. Fragments as little as 1-inch long with two nodes are able to root and colonize.
* Dry boats and equipment for 5 days before transporting them to a new water body.
* Do not dispose aquarium water or plants into water bodies.
* Desiccate plant material and/or dispose by securely sealing in plastic bags and placing in the trash for disposal.
* Learn to identify Eurasian Water-milfoil and report findings to the Montana Department of Agriculture; Montana Fish, Wildlife and Parks; County Extension agent; or Weed Coordinator.

CHEMICAL CONTROL [Adapted from Parkinson et al. 2011]
Diquat, Endothall, 2,4-D, Triclopy, and Fluridone have been used to herbicide Eurasian Water-milfoil plants in

water bodies. Native water-milfoil are also susceptible to some of these herbicides. The herbicide concentration, exposure time before dissipating, timing of chemical control, and other factors are critical to effectively hinder Eurasian Water-milfoil and reduce impacts to native vegetation – see Parkinson et al. 2011, and always follow chemical label instructions and use restrictions. These herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

MECHANICAL CONTROL [Adapted from Parkinson et al. 2011]
Raking and hand-harvesting can be effective for controlling small populations or early infestations. However, the risk of spread by fragmenting the plants is very high. Fragment barriers around harvest operations have been developed. All plant material should be bagged and desiccated before placing in the trash for disposal. Single harvests should be done when biomass is at its peak. It is recommended to harvest several times during the growing season, and for consecutive years. Areas harvested once can re-generate.

PHYSICAL CONTROL [Adapted from Parkinson et al. 2011]
Benthic barriers are mats laid down on the floor of the water body around docks and other high-use areas. They prevent light from penetrating and prevent plants from rooting. They are usually effective, but kill all vegetation. They are removable once the infestation has been destroyed. Barriers must be monitored because sediment will accumulate and provide a substrate for Eurasian Water-milfoil to colonize. Plants can root in 4 cm (1.5 inches) of soil.
Drawdowns lower the water levels to expose plants. This method has been effective at killing plants and reducing infestations when timed with freezing temperatures for 96 hours. This control may require extensive planning and permitting, and may hurt non-targeted vegetation and animal life.

BIOLOGICAL CONTROL [Adapted from Parkinson et al. 2011]
Two insects are being studied for their ability to control Eurasian Water-milfoil: Watermilfoil Moth (Acentria ephemerella) [native to Europe] and milfoil weevil (Euhrychiopsis lecontie) [native to North America].

CULTURAL CONTROL [Adapted from Parkinson et al. 2011]
Non-native water-garden plants should never be dumped near to or within wetlands, streams, rivers, lakes, or ponds. Before purchasing plants, verify that the plant is not invasive.

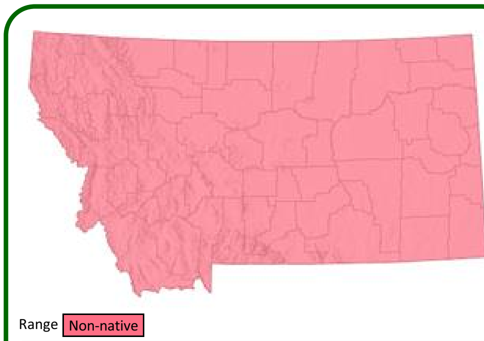
Contact information for Aquatic Invasive Species personnel:
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

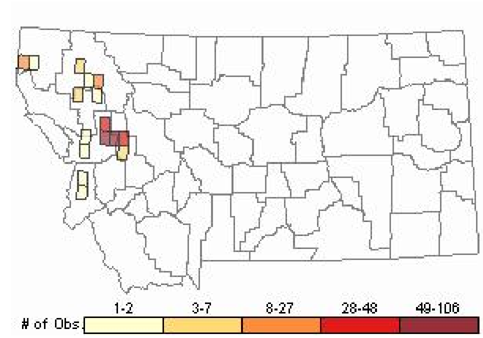
American Water-lily
Nymphaea odorata

View in Field Guide

Aquatic Invasive Species
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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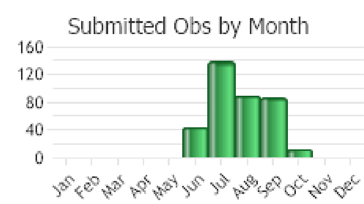


General Description

PLANTS: Aquatic perennials with floating leaves and floating, showy flowers. Rhizomes are 2-3 cm in diameter, long, branched, creeping, and covered with short, black hairs. Sources: Lesica et al. 2012; DiTomaso and Healy 2003.

LEAVES: Large, floating, nearly orbicular, and 8-20 cm long. Leaves are green above and green to purple below. Margins are entire (smooth) and bases are cordate-shaped, like the top of a heart. Petioles are long and attached to a rhizome. Sources: Wiersema *in* FNA; Lesica et al. 2012.

INFLORESCENCE: Singular flowers have at least 17 white, showy petals, 4 green or reddened sepals of at least 3 cm long, and float with a long flower stem (peduncle). Sources: Wiersema *in* FNA; Lesica et al. 2012.

Phenology

Flowering occurs from spring to summer, or into early fall for more southern populations (DiTomaso and Healy 2003).

Diagnostic Characteristics

In Montana three genera represent the "water-lily family": *Brasenia* (water shield), *Nuphar* (pond-lily), and *Nymphaea* (water-lily).

Brasenia species have round to elliptical floating leaves with no basal sinus or split in the leaf.

Nuphar species have heart-shaped floating leaves that appear split, yellowish sepals, and inconspicuous petals.

Nymphaea species have heart-shaped floating leaves that appear split, 4 green sepals, and numerous white petals. In Montana *Nymphaea odorata* and *Nymphaea leibergii* differ in their fragrance, sepal length, and number of petals. *Nymphaea odorata* has fragrant flowers (Hitchcock et al. 1964), at least 17 white petals, and sepals of at least 3 cm long (Lesica et al. 2012). *Nymphaea leibergii* lacks fragrant flowers (Hitchcock et al. 1964), has 7 to 15 petals, and sepals of 3 or less cm long (Lesica et al. 2012).

Our plants in Montana are *Nymphaea odorata* subspecies *odorata*.

Habitat

Acidic to alkaline lakes and ponds in valleys (DiTomaso and Healy 2003; Lesica 2012).

Management

The Missoula County Weed Board received a petition on March 3, 2020 to list Fragrant Water-lily as a noxious county plant (Slotnick et al. 2020). The County Weed Board reviewed the status and known impacts of the species in neighboring Montana counties, states, and provinces and recommended that listing as noxious was in the best interest of the public (Slotnick et al. 2020). On December 10, 2020 the Board of Missoula County Commissioners passed a resolution to designate *Nymphaea odorata* Aiton as noxious in Missoula County, Montana (Slotnick et al. 2020).

Contact information for Aquatic Invasive Species personnel:
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

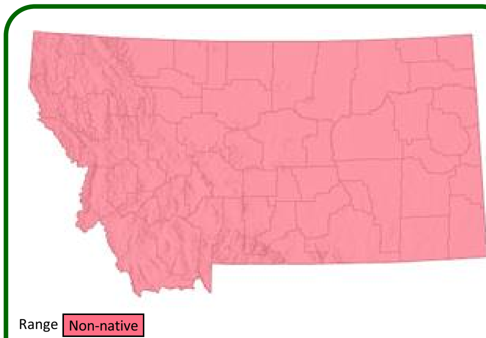
Dyer's Woad

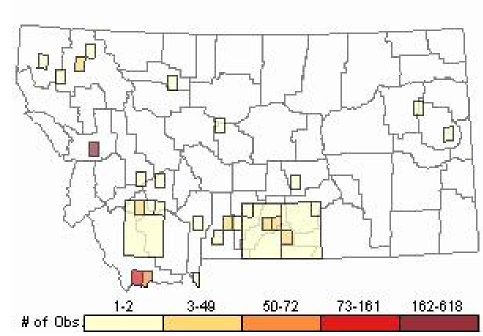
Isatis tinctoria

View in Field Guide

Noxious Weed: Priority 1A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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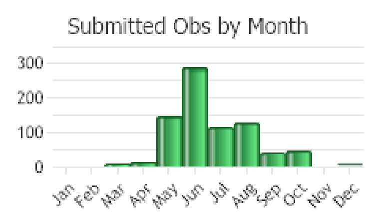


General Description

PLANTS: Typical biennial forbs. Stems are erect, simple, and 30–100 cm tall. Plants develop a taproot and several lateral roots. The taproot can be 3-5 feet long to access deeper water sources. Within the upper 12 inches of soil, several lateral roots grow outwards to access shallow water sources.

LEAVES: Basal leaves form a rosette where blades are blue-green, petiolate, oblanceolate, 5–18 cm long, and with entire margins. Stem leaves are arranged alternately. Stem leaves have blades that are blue-green, lanceolate, sessile, and clasp the stem (auriculate). Vestiture hirsute with simple hair at the stem base, otherwise glabrous.

INFLORESCENCE: Collectively, the inflorescence is branched (panicle); yellow flowers are arranged in a raceme on each of the upper branches. At maturity flowers appear bright yellow with a hint of chartreuse green. Sources: McConnell et al. *in* Sheley and Petroff 1999; Lesica et al. 2012.

The genus *Isatis* comes from a Greek word used for a dye plant (FNA 2010).

Phenology

Flowers April through June. Fruits June through July.

Diagnostic Characteristics

See also General Description and Reproductive Characteristics.
Unlike most mustards, the fruits of Dyer's Woad do not split open to expose the seeds, but rather fall intact.
Basal and stem leaves have a cream-colored midrib on the upper surface.

Habitat

Roadsides, fields, pastures, grasslands, sagebrush hillsides, prairies, railroad embankments, waste areas (FNA 2010). Valleys in Montana (Lesica et al. 2012).

Management

PREVENTION [Adapted from McConnell et al. *in* Sheley and Petroff 1999]
Successful management seeks to prevent infestations and to inventory land annually to detect occurrences early.

MECHANICAL and PHYSICAL CONTROL [Adapted from McConnell et al. *in* Sheley and Petroff 1999]
Hand-pulling is very effective for containment or control because plants are easy to identify and easy for volunteer groups to remove. It works well in difficult to reach areas, like fence rows, and in difficult or sensitive

areas. Pulling sessions should be timed with approaching full bloom. The entire plant and taproot must be removed to prevent re-growth. A follow-up session should occur 3-4 weeks later to pull any plants that re-grew or that were missed from the first session. Plants should be bagged and burned or be allowed to fully desiccate before disposing in the landfill. Plants with green pods are capable of germinating. Several examples in Montana, Utah, and other places have shown the effectives of hand-pulling in areas as large as 62 acres over an 8 year period. The level of effort required also diminishes with time, even after one treatment.

Mowing done during the flower bloom stage (before fruit development) will reduce seed production and may increase plant mortality.

Cultivation: Tillage works to reduce Dyer's Woad in fields planted with annual or row crops. Seedlings that emerge after tilling cannot bolt and mature until after they undergo a cold period. Herbicides in combination with tillage can remove late emerging plants. Alfalfa crops that are not irrigated can be cultivated in the spring with a flex-tine harrow. A combination of crop rotation, tillage, and herbicide treatments should be used where Dyer's Woad has infested alfalfa fields.

CHEMICAL CONTROL [Adapted from McConnell et al. *in* Sheley and Petroff 1999]
The most effective herbicide treatment to control Dyer's Woad is Metsulfuron (0.75 ounce per acre) or Chlorsulfuron (1.0 ounce per acre) combined with 2,4-D (3 pints per acre). Using either Metsulfuron or Chlorsulfuron also requires applying a nonionic surfactant. The herbicide mixture should be applied to rosettes and stems up to the late bloom stage in order to prevent seed set and viable seed production.

On its own 2,4-D will kill rosettes, but when applied to flowering plants it will not prevent seed production.

Imazapic (8-12 ounces per acre) with methylated seed oil (MSO 1 quart per acre) will kill rosettes or bolting plants. Alternatively, flowering stalks could be removed manually (and bagged) and their rosettes and stem herbicided.

GRAZING MANAGEMENT [Adapted from McConnell et al. *in* Sheley and Petroff 1999]
A study in Utah found that sheep ate at about 16% of Dyer Woad plants and about 39% of the leaves on rosettes up to May 18th. Afterwards, sheep selected other plants.

BIOLOGICAL CONTROL [Adapted from McConnell et al. *in* Sheley and Petroff 1999]
Puccinia thlaspeos is a native rust pathogen that infects Dyer's Woad plants and prevents seed production. Studies have focused on abilities to inoculate this rust into Dyer's Woad populations and on the interactions among rust, herbicides, and plants.

Montana's Dyer's Woad Task Force is led by Amber Burch who can be contacted at: (406) 683-3790 or aburch@beaverheadcounty.org

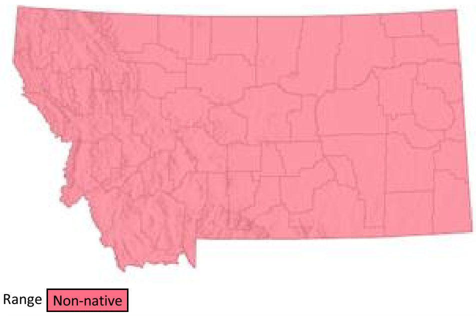
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

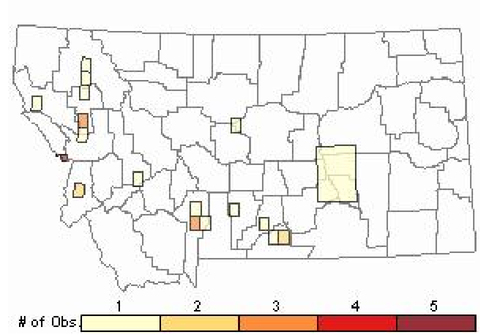
Yellow Starthistle
Centaurea solstitialis

View in Field Guide

Noxious Weed: Priority 1A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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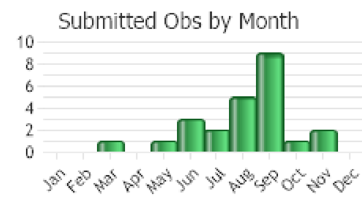


General Description

PLANTS: An annual with erect, branched, and winged stems that grow 10–80 cm (Lesica et al. 2012). Plants are scabrous and gray-tomentose (Lesica et al. 2012).

LEAVES: Basal leaves form a rosette are are deeply lobed and approximately 5 cm wide and 20 cm long (Sheley and Petroff 1999). Stem leaves are entire, linear-oblanceolate, 5–15 cm long, short-petiolate, and have thin woolly hairs (Sheley and Petroff 2009; Lesica et al. 2012).

INFLORESCENCE: Corymbiform. Yellow flower heads are solitary on open leafy stems (FNA 2006). Involucres are ovoid and 13–17 mm tall (Lesica et al. 2012). The outer bracts are pale green and armed with a stout, straw-colored spine of 1-2 inches (2.5-5 cm) long (Sheley and Petroff 2009; Lesica et al. 2012). The spines radiate out into a star-shape. The inner bracts are lanceolate with swollen tips (Lesica et al. 2012). Corollas are 13–20 mm long. Pappus is absent or of white, unequal bristles of 2-4 mm long (FNA 2006). Fruits (cypselae) are 2–3 mm long and of two types: outer fruits are dark brown without a pappus and inner fruits are mottled white/light brown and with a pappus (FNA 2006).

Phenology

Flowering mostly from summer through autumn, but year-round in frost-free coastal areas (FNA 2006).

Diagnostic Characteristics

Yellow Starthistle is a winter annual with bright yellow flowers. The flower head (involucral) bracts are tipped with stout, straw-colored spines of 2.5-5.0 cm (1-2 inches) long (Sheley and Petroff 1999). The spines radiate from the flower head in a star shape. In the western U.S. and depending upon the growing conditions plants can be 10 cm to 1.5 meters tall (Sheley and Petroff 1999).

Habitat

Grasslands, rangeland, pastures, woodlands, roadsides, and wastelands (FNA 2006; Lesica et al. 2012).

Management

Successful control requires integrating strategies to prevent new, eradicate or containing existing, and controlling large populations.

PREVENTION [Adapted from Sheley et al. *in* Sheley and Petroff 1999]
Targeting actions that prevent or reduce seed production will hinder its ability to grow and spread. Spread can be

reduced through many actions, such as, a) preventing vehicles from driving through and animals from grazing within infested areas, b) thoroughly washing the undercarriage of vehicles that have travel through infested areas, c) developing educational campaigns to teach people to not pick and transport the yellow flowers, and d) encouraging landowners to frequently monitor their land for new infestations and, when found to implement effective control methods.

BIOLOGICAL CONTROL [Adapted from Sheley et al. *in* Sheley and Petroff 1999]
As of 1996 three weevils (*Bangasternus orientalis, Eustenopus villosus, Larinus curtus*) and three flies (*Chaetorellia autralis, Urophora sirunaseva, Urophora jaculata*) that attack Yellow Starthistle flower heads have been approved for released. They were released on plants in Canada and the Pacific Northwest, but apparently are not in Montana.

CHEMICAL CONTROL [Adapted from Sheley et al. *in* Sheley and Petroff 1999]
Herbicides are effective, especially when properly managed with other tactics. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Picloram at the 0.25 pound per acre rate can provide selective control when applied to seedlings, rosettes, or plants beginning to bolt without harm to well-established grasses. It cannot be used in sandy soils, near surface waters, or in areas with a high-water table.
2,4-D at the 0.5 pound per acre rate can be effectively used in riparian areas or around homesteads.

Clopyralid at the 1.2 pound per acre rate can be applied before plants produce flower buds and in areas with high water tables.

Glyphosate at the one pint per acre rate will kill all plants and can be used in revegetation projects that need to prepare an initial seedbed for seeding desirable vegetation.

PHYSICAL & CULTURAL CONTROLS [Adapted from Sheley et al. *in* Sheley and Petroff 1999]
Hand-pulling is very effective because it is an annual. Pulled plants should be bagged and dessicated or preferably burned before disposing to ensure that seeds are not viable. Hand-pulling small infestations, around gardens and homesites, and within crop fields, riparian areas, and along waterways will eradicate or slowing its spread. Systematic surveys and repeated removal should be conducted every 2-4 weeks throughout the growing season.

Tilling and discing severs roots below the soil surface and will kill plants, but it should be done periodically through the growing season. This will deplete the seed source and lessen the severity for re-invasion. Once the ability for re-invasion has been controlled then desirable plants can be established.

Mowing is not effective because plants respond by growing more prostrate. Mowing in dry years might reduce seed production. Mowing before it rains will stimulate growth and increase seed production.

Burning populations will increase infestations. Fire releases nutrients and Yellow Starthistle seeds are quick to capture them, germinate, and grow.

Revegetation should follow any control method. A mix of perennial grass cover is best to interrupt the cycle of re-invasion because they compete strongly for light, nutrients, and water resources. This may require the use of particular cultivars of exotic and/or native grasses. Successful seeding will depend upon the particular grass species/cultivars, the density that establishes, environmental conditions, and the land manager’s ability to maintain grass vigor. It is recommended to not fertilize new grass seedings that are infested with yellow starthistle because it will increase the forb’s production.

GRAZING CONTROLS [Adapted from Sheley et al. *in* Sheley and Petroff 1999]
Grazing and grazing management can be effective at controlling Yellow Starthistle. Cattle or sheep can suppress Yellow Starthistle if grazed when plants bolt, but before they develop spines. Prior to developing spines, the crude protein content of plants ranges from 5-10%. Repeated grazing is necessary to suppress growth, but the intensity and frequency should depend upon environmental conditions. In revegetated areas, the desirable rangeland plants should achieve full recovery before being grazed, to ensure they are most competitive against Yellow Starthistle.

Useful Links:

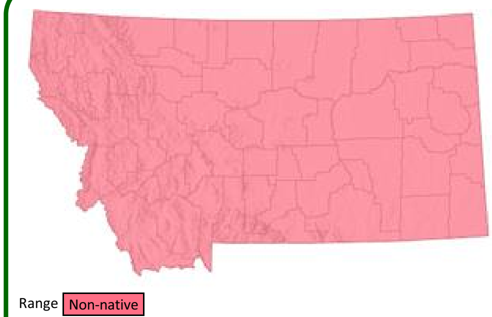
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

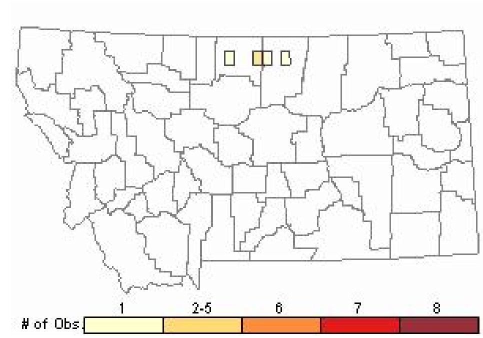
European Common Reed
Phragmites australis ssp. australis

View in Field Guide

Noxious Weed: Priority 1A
Non-native Species
Global Rank: G5T5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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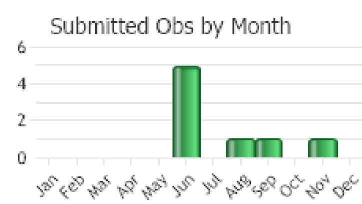


General Description

PLANTS (species level): Cool season, rhizomatous perennial. Stems 1.5-3.5 m, forming dense stands (Lesica 2012).

LEAVES (species level): Blades 2–4 cm wide, flat and lax to ascending; sheaths with overlapping margins; ligules hairy, 3–6 mm long (Lesica 2012).

INFLORESCENCE (species level): A plumose panicle 15–32 cm long. Spikelets 11–14 mm long, with 3 to 8 florets, the florets covered by silky hairs from the rachilla; glumes shorter than the florets. Lemmas hairless, with an awn-like tip; the rachilla with long silky hairs; palea well developed. Disarticulation above the glumes; unit of dispersal the floret (Lesica 2012).

In Montana, common reed consists of two subspecies (ssp.): ssp. americanus is native and more common while ssp. australis is introduced and very localized. Populations can be easily identified to the subspecies level (see diagnostic characteristics).

Diagnostic Characteristics

The MTNHP is tracking locations of common reed grass at the subspecies level. It is possible that both subspecies can be found adjacent to each other, yet be distinguishable. Consider submitting your observation data to MTNHP.

Phragmites australis subspecies *americanus* is native [Adapted from Michigan State University Extension (no date)]:
STEM COLOR/LEAF SHEATHS: Sheaths easily fall off, exposing the stem which will turn bright red when exposed to sunlight.
LIGULES: The width of the ligule membrane (not including the fringe of hairs at the top) is the critical measure. The ligule membrane is slightly wider, ranging from 0.4-1.0 mm tall.
GLUMES: In a spikelet, the first (or lowest) glume is relatively longer, ranging from 4-7 mm.
GROWTH FORM: It is less robust, typically reaching 6 feet. It grows a bit more scattered, allowing for light to penetrate through the canopy and for other plants to colonize. Where nutrient availability is high, it will grow denser and taller. Stems break down easily over winter, allowing for other plants to grow.

Phragmites australis subspecies *australis* is exotic [Adapted from Michigan State University Extension (no date)].
STEM COLOR/LEAF SHEATHS: Sheaths cling tightly to stem, covering the dull, tan stem. It grows stolons, which are horizontal stems that spread on the soil surface.
LIGULES: The width of the ligule membrane (not including the fringe of hairs at the top) is the critical measure. The ligule membrane is slightly narrower, ranging from 0.1-0.4 mm tall.
GLUMES: In a spikelet, the first (or lowest) glume is relatively shorter, ranging from 2.6-4.2 mm.
GROWTH FORM: It forms dense monocultures, outcompeting native species. Stems can grow to 18 feet. Where

nutrient availability is high, it will grow denser and taller. Stems do not break down slowly, maintaining a thick thatch.

Sterile specimens of *Phragmites* are superficially similar to *Arundo*, a weedy, non-native species that gets as far north as Malheur County, Oregon (Lesica 2012). The genera can be distinguished based on glumes. The glumes of *Phragmites* are glabrous and shorter than the lemmas. The glumes of *Arundo* longer than the florets and covered with soft, whitish hairs 6-8 mm long.

Habitat

Margins of ponds, marshes, and river floodplains (Lesica 2012). Often where there is disturbance.

Management

Management of *Phragmites australis* is dependent upon the subspecies. It is important to accurately identify the subspecies before implementing any management action. In Montana, land managers are encouraged to maintain and native common reed populations while eradicating non-native populations. The establishment, spread, and increase in abundance of the non-native *Phragmites australis* subspecies *australis* is associated with human-caused disturbances, such as from land development, tidal manipulation, and waterway construction.

The native *Phragmites australis* subspecies *americanus* has attributes (rhizomatous and dense growth form) that make can make it desirable in reclamation projects, such as in controlling erosion. Care should be taken to ensure that only the native subspecies is seeded or planted. In Montana, native *Phragmites australis* subspecies *americanus* stands appear to be small monocultures that occur in a matrix with other plant communities; however, plants can create enough openings to allow other plants to co-exist.

In portions of the U.S. *Phragmites australis* been called an "ecosystem engineer" because dense, monotypic stands can change plant richness, soil properties, sedimentation rates, animal habitat use, and food webs (Gucker 2008). Large stands of *Phragmites australis* have been found to decrease plant diversity due to its growth form and ability to trap sediment and collect common reed leaf litter. In New Jersey, *Phragmites australis* stands had lower water salinity, depth to water table, and topographic relief than stands dominated by saltmeadow cordgrass and saltgrass in brackish tidal marshes (Gucker 2008). Further these differences were determined to be significant within three years of *Phragmites australis* establishment. For a synthesis of studies evaluating impacts or ecosystem changes with respect to *Phragmites australis* and various native plant habitats, please consult the Fire Effects Information System for *Phragmites australis* (2008) webpage.

In many parts of the U.S. large monocultures of the non-native *Phragmites australis* subspecies *australis* has warranted management actions that includes altering hydrology, herbicide application, applying fire, planting competitive vegetation, and other tactics. It is recommended that *Phragmites australis* management be site-specific, goal-specific, and value-driven (Gucker 2008). Further, it is imperative to understand the biological, chemical, and physical impacts at the particular site in order to determine the management strategy and process.

PREVENTION
Large, monocultures of *Phragmites australis* can be prevented through management actions that encourage competing vegetation and minimize nutrient loads (Gucker 2008). *Phragmites australis* spreads faster in areas with high-nutrient availability, particularly where competing vegetation has been removed or reduced. The timing and intensity of hydrological changes can also impact *Phragmites australis* stands. Please consult the Fire Effects Information System for *Phragmites australis* (2008) webpage for a synthesis of studies and literature on this subject.

FIRE
Prescribed fire is not recommended for controlling the *Phragmites australis* subspecies *australis*. Plants grow in wet environments which are often poorly affected by fire and where other native plants are not adapted to fire. *Phragmites australis* subspecies *australis* plants may be top-killed by fire, but their rhizomes usually survive and will re-sprout(Gucker 2008). Unless rhizomes are killed, fire can stimulate re-sprouting (Gucker 2008). In the short-term, fire may decrease plants, but if viable rhizomes remain than stands will re-colonize (Gucker 2008).

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.

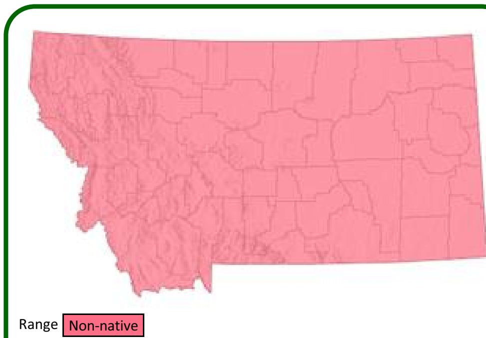
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

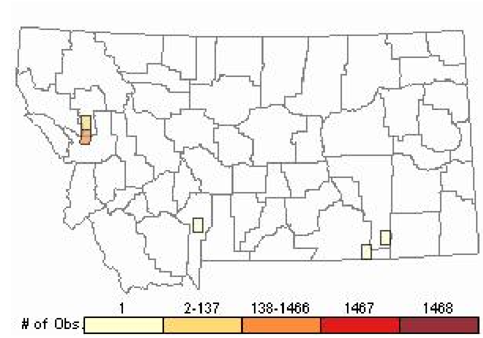
Medusahead
Taeniatherum caput-medusae

View in Field Guide

Noxious Weed: Priority 1A
Non-native Species
Global Rank: G4G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value:





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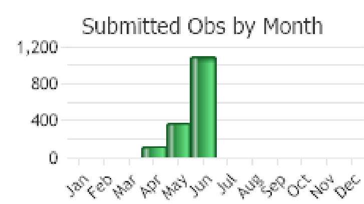

General Description

PLANTS: An annual grass that grows (2)8 to 20(27) inches tall and can produce tillers. Sources: Miller et al. *in* Sheley and Petroff 1999; FNA 2007.

LEAVES: Blades are 0.7-2.5mm wide, flat to rolled. Auricles are usually present, 0.1-0.5 mm long. Sources: Miller et al. *in* Sheley and Petroff 1999; FNA 2007.

INFLORESCENCE: Stems typically produce a single spike though large plants may have multiple spikes. A spike typically has 2-3 spikelets per node, but only 1 becomes fertile. Both lemmas and glumes have flat awns. Glumes arise from below the seeds (fruits) at the nodes and remain on the plant after seed dispersal. Glumes are tipped with shorter awns and are 7-80 mm long, erect to reflexed, and have barbs that point upward; they are felt when rubbed in the opposite direction. The long awns attach to the lemmas that hug the seeds; the long awns are 30-100 mm long and remain attached to the seed when dispersed. Sources: Miller et al. *in* Sheley and Petroff 1999; FNA 2007.

See video on Identifying Invasive Annual Grasses in Montana.

Phenology

Grows May to July (FNA 2007).

Diagnostic Characteristics

Taeniatherum caput-medusae (adapted from Miller et al. *in* Sheley and Petroff 1999): As a seedling leaves appear delicate, slender, and bright green. Developing seedheads are wrapped in leaves with their awn tips visible. As the plant matures the seedhead becomes fully visible and the awns stick straight up. Mature plants are wiry, slender, and have a few short, narrow leaves. As the plant dries it turns from a purplish to tan color, and the awns twist.

Taeniatherum (Medusahead) plants are exotic annuals. Plants have 2-3 sessile spikelets at each node which bear 1 fertile floret and 2 sterile, reduced florets. Lemmas are rounded with few to no scabrous hairs.

Hordeum (Barley) plants are native perennials or annuals or exotic annuals. Plants have 3 spikelets at each node. The central spikelet is sessile while the lateral spikelets have a stalk (pedicel). Each spikelet bears 1 floret. Sometimes there is only 1 fertile floret and 2 sterile, reduced florets. Cultivated plants may differ from this description.

Secale (Cereal Rye) plants are exotic annuals to short-lived perennials. Spikelets mostly 1(2) per node and with 2 florets. Lemmas are strongly keeled and scabrous. Cultivated plants that may occur along roadsides or in fields.

Elymus (Wildrye) plants are native perennials. Spikelets mostly 2-3+ per node, and more than two are fertile. Lemmas are rounded with few to no scabrous hairs. Lemmas are awned. Upper surface of leaf blades may have unequally spaced, prominent veins.

Habitat

Plants invade stony soils of disturbed sites in the western states (FNA 2007).

Management

Useful Links:
Montana Invasive Species website
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Montana Weed Control Association Contacts Webpage.
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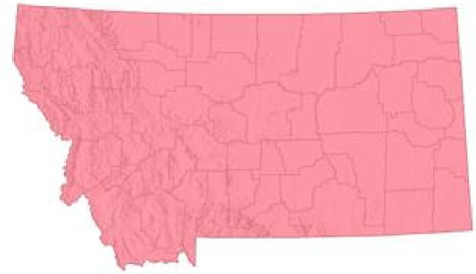
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

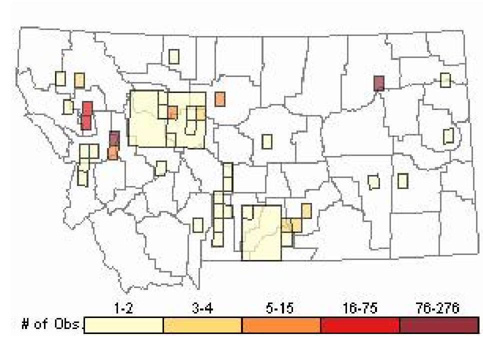
Purple Loosestrife
Lythrum salicaria

View in Field Guide

Noxious Weed: Priority 1B
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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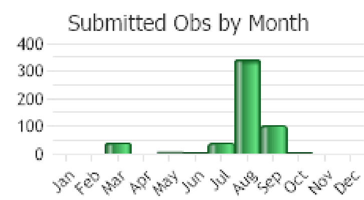

General Description

PLANTS: An erect perennial forb that grows to 3 meters tall, often forming clusters or clumps (DiTomaso and Healy 2003). Plants are nearly hairless (glabrate) to pubescent (hairy) (Lesica 2012).

LEAVES: Leaves are oppositely arranged, sessile (no leaf stem), and entire (smooth leaf margin). Leaves are narrowly lanceolate, about 3-10 cm long, and with a cordate leaf-base (Lesica 2012). Upper stem leaves become alternate (DiTomaso and Healy 2003). Sometimes lower stem leaves are whorled (DiTomaso and Healy 2003).

INFLORESCENCE: Spike-like panicles of showy pinkish-purple to magenta flowers and leaf-like bracts terminate stems (Lesica 2012; DiTomaso and Healy 2003).

Diagnostic Characteristics

Species of *Lysimachia* are also called Loosestrife, but are native members of the Myrsine Family (Myrsinacaeae), or in older taxonomic treatments are placed in the Primrose Family (Primulaceae). Our native Montana *Lysicmachia* species also have opposite, entire leaves, and grow in moist areas to wetlands, but their flowers are 5-6 parted and yellow. Depending upon the species, leaves are sessile or not. Users of this field guide are encouraged to identify specimens using the Manual of Montana Vascular Plants (Lesica 2012).

Habitat

Perennial and seasonal wetland habitats, especially where disturbed: marshes, pond margins, ditches, and streams in valleys (DiTomaso and Healy 2003; Lesica 2012). Plants tolerate a wide range of soil types (clay, sand, muck, and silt), but grow best in slightly acidic to neutral soils (The Nature Conservancy 1987; DiTomaso and Healy 2003). During the growing season, plants do not tolerate inundation (DiTomaso and Healy 2003). It usually grows in full sun, but can tolerate 50 percent shade (The Nature Conservancy 1987).

Management

Montana's Purple Loosestrife Task Force is led by Dave Burch who can be contacted at: (406) 444-3140 or dburch@mt.gov

Purple Loosestrife was introduced from Eurasia for its ornamental and medicinal qualities, but escaped cultivation and has become a noxious weed in many portions of North America (DiTomaso and Healy 2003). Surveys to identify populations should be conducted in July and August when the plant is flowering (TNC 1987). The magenta colored flowers are easy to locate, and may be identifiable from aerial photographs.

CHEMICAL CONTROL
Glyphosate controls Purple Loosestrife (TNC 1987). On dry land trade names of RoundUp and Rodeo (developed by Monsanto) can be used. On water aquatic-labeled formulas must be used in combination with a non-ionic

surfactant (TNC 1987). Herbicide applications should spot-spray (and not broadcast spray) plants because they are non-selective and will kill all plants. The safest method for applying a glyphosate herbicide is to cut stems to a height of about 6 inches and then paint or drip the cut surface with a 20-30 percent solution (TNC 1987).

Other recommendations for using glyphosate products include spraying plants after their peak bloom, spraying no more than 50 percent of the foliage to prevent damage to desirable plants, and to follow-up in the same growing season in order to assess effectiveness and control missed plants (TNC 1987). It is important to maintain strong competition from the desirable plant community or else Purpose Loosestrife will return to dominate (TNC 1987).

Herbicides designed to kill only broadleaf (dicot) plants, such as 2-4-D have also controlled Purple Loosestrife infestations. Broadleaf herbicides will not harm monocots, which includes all grasses, sedges and rushes (Juncus spp.). Herbicides such as 2,4-D can be applied to Purple Loosestrife in the spring after the plants have obtained 10-15 percent of their mature growth (TNC 1987). A combination of 2,4-D and Dicamba have also been used with good success (TNC 1987).

MECHANICAL CONTROL
Newly established plants should be hand-pulled before they develop flowers to ensure that seeds have not developed (DiTomaso and Healy 2003). This will prevent their spread. Root fragments that remain in the soil can re-sprout. All parts of the Purple Loosestrife plants must be bagged and removed from the site to ensure that they do not re-sprout (TNC1987). If possible, bagged plants should be tied and left in the hot sun to wither and die before disposing. It is important to not damage the desirable plant community in order to keep them competitive against Purpose Loosestrife’s will to survive (TNC 1987).

Wetlands should be seeded with native and desirable plant species. If Purple Loosestrife is mixed with desirable plants, then returning to help distribute seeds from desirable species may help. Otherwise a native seed mix of 5-9 species that are also approriate for the site should be developed and applied using best standards and practices.

BIOCONTROL
The Black-margined (Galerucella calmariensis) beetle, Golden Loosestrife (Galerucella pusilla) beetle, and Loosestrife Root-Weevil (Hylobius transversovittatus) were released in 1992 into some northern states (DiTomaso and Healy 2003). By 1994 the beetles were established in Washington, Oregon, Montana, and Idaho (DiTomaso and Healy 2003). As of 2017 in Lake County, Montana, Galerucella pusilla and Hylobius transversovittatus are thriving and inhibiting the plant’s abilities to develop viable seed heads (Lake County Weed District Coordinator, personal communication). These insects are moving on their own to other areas where Purple Loosestrife occurs (Lake County Weed District Coordinator, personal communication).

The loosestrife flower-feeding weevil (Nanophyes marmoratus) was released in 1994 into Washington, Oregon, Montana, and Colorado (DiTomaso and Healy 2003). However, its status in Montana is unknown (Lake County Weed District Coordinator, personal communication).

Useful Links:
Montana Invasive Species website
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Montana Department of Agriculture - Noxious Weeds
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Montana Weed Control Association Contacts Webpage.
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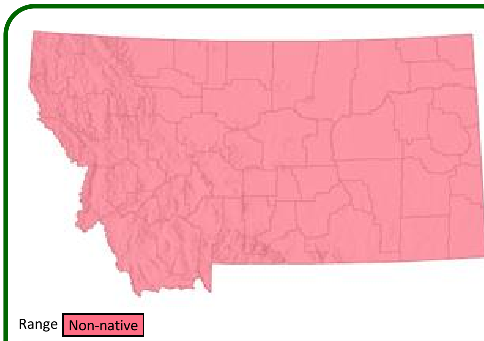
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

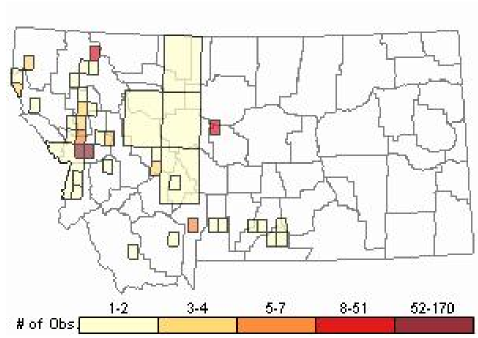
Japanese Knotweed
Polygonum cuspidatum

View in Field Guide

Noxious Weed: Priority 1B
Non-native Species
Global Rank: GNRTNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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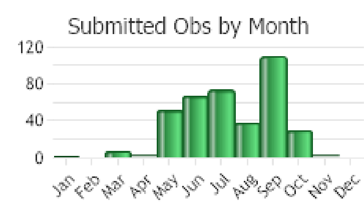

General Description

PLANTS: Large, rhizomatous, herbaceous perennials with erect, branched stems that reach to 2 meters (6 feet) tall in Montana. In other states they may reach to almost 6 meters (19 feet) in height. Sources: Parkinson and Mangold 2017; Lesica et al. 2012.

LEAVES: Petiolate and alternately arranged. Blades are ovate, 8–20 cm long with pointed tips and a truncate base. Stipules occur at leaf nodes and are brown, glabrous, and 4–6 mm long. Source: Lesica et al. 2012.

INFLORESCENCE: Flowers arranged in panicles at leaf axils. The greenish-white to creamy-white flowers appear perfect with stamens and pistils, but functionally are unisexual. Each flower is 5–7 mm long with a tubular base and pedicels (stems) of 3–5 mm long. The petals and sepals look-alike (tepals) and are white to pink. Fruit is an achene that is shiny-brown, 2–4 mm long, 3-sided, and enclosed by an inflated perianth (tepals). Source: FNA 2005; Lesica et al. 2012.

Phenology

Flowering occurs in August to September and fruits/seeds develop in September (Parkinson and Mangold 2017).

Diagnostic Characteristics

The **Japanese Knotweed complex** includes Japanese Knotweed, Giant Knotweed, and Bohemian Knotweed which is a hybrid between the Japanese and Giant Knotweeds. Japanese, Giant, and Bohemian plants are often mis-identified with each other. A strong hand-lens is required. Schutter Diagnostic Laboratory at Montana State University, Bozeman can assist in identifying good quality plant specimens.

Plants in the **Japanese Knotweed complex** exhibit flowers with fringed stigmas and erect, hollow stems that grow in clumps, resembling bamboo. Unlike bamboo, leaves of the knotweed complex are ovate in shape and have brown papery or membranous sheaths at the leaf nodes. Other ***Polygonum*** species may be commonly called **Knotweed** or **Smartweed**, but are either less than 1 meter tall or are vines or have mostly basal leaves and few stem leaves, and species in the “complex” only have hollow stems.

Japanese Knotweed - *Polygonum cuspidatum, Fallopia japonica*, or *Reynoutria japonica*
* Leaf blades are 1-4 inches (3-10 cm) long.
* The leaf tip is abrupt and also acuminate.
* Veins on the lower surface of leaf are minutely scabrous (roughened) with swollen cells or knobs. Hairs if present are short, less than 0.1mm tall, unicellular, and with blunt tips.
* Mid-branch leaves with a leaf base that is flat where it joins the petiole - truncate to rarely slightly cuneate in shape.
* Inflorescence is usually longer than the subtending mid-branch leaf.
* Plants are approximately 5-8 feet (1.5-2.5 meters) tall, tending to be shortest in the complex.

* Plants usually don’t produce seeds.

Giant Knotweed - *Polygonum sachalinense, Fallopia sachalinensis*, or *Reynoutria sachalinensis*
* Leaf blades are 7.8-16 inches (20-40 cm) long.
* The leaf is more evenly tapered to a blunt or acute tip.
* Veins on the lower surface of leaf have multicellular hairs of 0.2-0.6 mm tall.
* Mid-branch leaves with a leaf base that is deeply heart-shaped where it joins the petiole - cordate in shape.
* Inflorescence is much shorter than the subtending mid-branch leaf.
* Plants are approximately 9.9-19.8 feet (3-6 meters) tall and branches sparingly. It is the tallest in the complex.
* Plants usually produce seeds.

Bohemian Knotweed - *Fallopia* x*bohemica*, a hybrid
* Leaf blades are 2-12 inches (5-30 cm) long. Largest mid-stem leaves are usually greater than 20 cm long.
* The leaf tip is usually not abrupt (cuspidate), but is acuminate.
* Veins on the lower surface of leaf are obscure (puberulent), not roughened, short, and acute at the tip.
* Mid-stem leaves with a leaf base that is flat to slightly heart-shaped where it joins the petiole – truncate to slightly cordate in shape.
* Inflorescence is either shorter or longer than the subtending mid-branch leaf.
* Plants are approximately 6.6-16.5 feet (2-5 meters) tall.
* Plants occasionally produce seeds.

Sources: Zika and Jacobson 2003; Flora of North America 2005; Lesica et al. 2012; Parkinson and Mangold 2017.

Habitat

In its native habitat it is an early successional plant and can colonize volcanic slopes (Parkinson and Mangold 2017). In Europe and North America it was planted into yards and managed landscapes, but has escaped into moist habitats that include riverbanks, canals, wetlands, lakeshores, utility right-of-ways, strip-mining areas, and roadways (Parkinson and Mangold 2017). In Montana it grows in gardens and lawns and along streambanks and reservoirs in valleys (Lesica et al. 2012).

Japanese Knotweed is considered shade intolerant and has been found in soil with pH ranging from 4.5 to 7.4 (Parkinson and Mangold 2017). Plants are not limited by soil type and can establish, grow, and have good survival rates in nutrient-poor to nutrient-rich soils. In the Cascade Range, Japanese Knotweed has been found in open canopies with Black Poplar (*Populus nigra*), Red Alder (*Alnus rubra*), and Douglas-fir (*Pseudotsuga menziesii*) which implies that open-canopy forests in Montana could be vulnerable (Parkinson and Mangold 2017).

Management

Proper identification, early detection, and control of Japenese Knotweed in previously non-infested sites is the key to preventing establishment of new colonies in Montana. Plants are found scattered in Montana, but have not yet developed impenetrable patches along our roadways and rivers; therefore, we must prevent spread while suppressing and eradicating existing infestations. Efforts to control Japanese Knotweed will require a combination of techniques for many years (Parkinson and Mangold 2017). Upon eradication or control, a 60-foot swatch around the population should be monitored yearly to determine if growth resumes.

PREVENTION [Adapted from Parkinson and Mangold 2017.]
Identify and suppress existing patches. Do not spread soil from infested areas because the soil will contain root fragments that can re-generate in other areas.

MECHANICAL and PHYSICAL CONTROLS [Adapted from Parkinson and Mangold 2017.]
Placing a heavy black plastic tarp tightly to the ground for more than one year can suppress plants. This is recommended for small infestations. However, rhizomes can go dormant for 20 years and frequently monitoring is required to document presence/absence.

Hand-pulling or digging is effective for small populations where plants are young. Plants should be pulled in moist soil and twice each month to remove new sprouts.

Stem Cutting is labor intensive, but effective. Cutting should occur 3 times each year for consecutive, multiple years, in order to reduce the reserves in the rhizomes. Further the last cutting in a year should occur before plants lose their leaves (which is near the onset of winter).

Mowing is effective if done close to the ground and repeated when plants reach 6 inches tall. Mowing should occur through the entire growing season.

Tilling alone is not recommended because it breaks rhizomes and encourages re-sprouting. However, it can be effective to stimulate leaf growth prior to a herbicide application.

Revegetation in combination with other techniques is recommended. On its own Revegetating sites will not be enough. Sites that appear to be eradicated or greatly suppressed, should be planted with competitive shrubs that are appropriate for the site. Competitive grasses can also be used in combination with shrubs. Potential shrubs could include species of willow (*Salix* spp.), Blue Elderberry (*Sambucus cerulean*), Red/Black Elderberry (*Sambucus racemosa*), Green Alder (*Alnus viridis*), Speckled Alder (*Alnus incana*). Potential grasses to plant with shrubs could include: Streambank Wheatgrass (*Elymus lanceolatus*) or great Basin Wildrye (*Elymus cinereus*).

CHEMICAL CONTROL [Adapted from Parkinson and Mangold 2017.]
Herbicides are effective, especially when properly managed with other tactics. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control. Chemical information is also available at Greenbook.

Stem injection is commonly used and involves using a hand-operated injection device that delivers repeated, pre-measured doses. Prior to injection, a hole must be made using an awl or similar tool. All stems must be treated. Glyphosate (0.17 ounce or 5 mL) injected into the hollow stem between the second and third node or about six inches above the ground has been used successfully. Glyphosate and 2,4-D (0.2 ounce or 6 mL) injected into the hollow stem between the second and third node has been used successfully.

Foliar applications have been used successfully. Aminopyralid broadcast sprayed at 7-14 ounces per acre when plants are 3-4 feet tall has been used successfully. Imazapyr and Metsulfuron Methyl chemicals are not selective and kill all plants and should only be used in non-crop sites. These chemicals have been broadcast sprayed at 25 ounces per acre after plants emerge. Imazapyr can also be applied at 4-6 pints per acre when plants are actively growing and a surfactant is recommended. In and around water, Imazapyr can be used on actively growing foliate at 3-4 pints per acre and use an adjuvant that is approved for aquatic use.

GRAZING CONTROLs [Adapted from Parkinson and Mangold 2017.]
Young shoots are palatable to sheep, goats, cattle, and horses. Grazing does not kill plants, but does weaken them. When grazing pressure is high, the establishment and growth of Japanese Knotweed is reduced.

BIOLOGICAL CONTROL [Adapted from Parkinson and Mangold 2017.]
No bio-control insects, pathogens, or fungi have been approved there are candidates being tested and screened for use in the U.S.

Useful Links:
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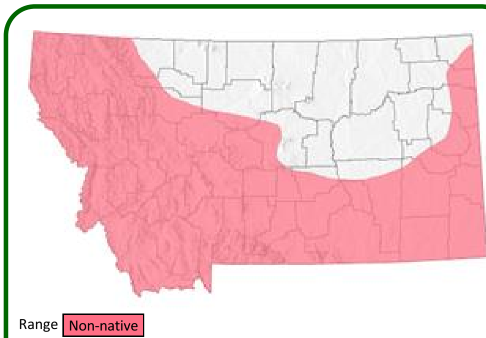
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

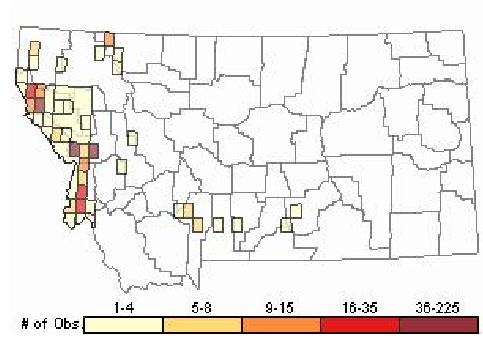
Blueweed
Echium vulgare

View in Field Guide

Noxious Weed: Priority 1B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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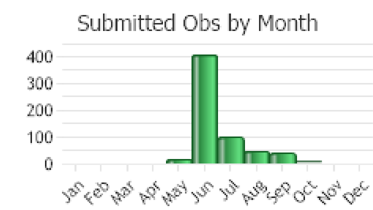

General Description

PLANTS: A taprooted biennial or short-lived perennial forb. Stems are single to many, erect, and 20–80 cm tall. Plants have two types of hairs: hispid hairs that are stout, spreading, and have a swollen red, purple, or black base, and strigose hairs that are smaller, stiff, straight, sharp, and appressed. The hispid hairs with the swollen base give the plant a spotted appearance. Sources: Graves et al. 2010; Lesica et al. 2012.

LEAVES: Leaves are basal and cauline and have the same hair types found on the stems. Basal leaves are simple with entire margins, oblanceolate in shape, petiolate, and about 6–20 cm long by 0.5-3.0 inches wide. Stem leaves are arranged alternately, linear-lanceolate in shape, and become smaller and sessile above. Sources: Graves et al. 2010; Lesica et al. 2012.

INFLORESCENCE: An elongate, bracteate raceme of helicoid cymes. Plants may have up to 50 cymes with each cyme bearing up to 20 flowers. Source: Graves et al. 2010; Lesica et al. 2012.

Phenology

Flowers June to October.

Diagnostic Characteristics

Blueweed could be confused with Phacelia species or members of the Borage Family.

Blueweed is identified by the following characteristics:
basal rosette with long, lance-shaped leaves; upper stem leaves are sessile; stems and leaves with both long and short hair types; stem appears spotted due to the swollen hairs; brightly colored blue funnel, shaped flowers growing on curled cymes; and bright pink or red stamens with 5 stamens of unequal length.

Linearleaf Phacelia - *Phacelia linearis* is differentiated by these characteristics:
Annual plants that lack a basal rosette; stem leaves have short-petioles (stalks); flowers are similar, but petals are lavender and more bell-shaped; the 5 stamens are exserted, but white; and the calyx is also hispid. Plants don’t have a spotted appearance.

Common Hound’s-tongue - *Cynoglossom officinale* is differentiated by these characteristics:
Plants have one hair type (villous) which are dense long, crooked, but unmated. Flowers (petals) are reddish-purple. Plants don’t have a spotted appearance.

Common Bugloss - *Anchusa officinalis*
Plants have one hair type, spreading hispid hairs which lack a swollen, colored base. Flowers (petals) are purple-blue and expand from a tube (salverform), and are not funnel-shaped. The 5 stamens are short and inserted within the length of the petals. Plants don't have a spotted appearance.

Habitat

Roadsides, fields, vacant lots, waterways, overgrazed pastures, and other disturbed areas (Graves et al. 2010). In Montana it grows in valleys (Lesica et al. 2012).

Management

Successful management of Blueweed requires an integrated weed management strategy that promotes a weed-resistant plant community and uses surveying, monitoring, and/or grazing management strategies in combination with hand-pulling, herbicide control, and/or revegetation.

PHYSICAL and CULTURAL CONTROLS [Adapted from Graves et al. 2010]
Hand-pulling is effective for smaller infestations if the soil is moist. Pulling should be done before flowering to avoid dispersing seeds. The entire taproot should be removed in order to prevent re-sprouting. Plants should be burned (see "burning" below) or bagged and left to desiccate before disposing into the landfill. Standard practice for hand-pulling any plant includes protecting yourself by using long-sleeves and gloves. Blueweed's stiff hairs can irritate the skin.

Mowing can reduce seed production, but will allow plants to re-sprout and produce flowers and seeds below the blade level.

Proper vegetation management will discourage invasion. Blueweed prefers sites with low soil nutrients and sparse vegetation. Over-grazing creates gaps in the vegetation, allowing blueweed (and other weeds) to colonize. Proper management of lawns, pastures, and rangelands will promote viable populations of desirable plants. Lawns and pastures should be fertilized to increase soil fertility and competitiveness of desirable plants. Revegetation of disturbed sites may be necessary (refer to Revegetation Guidelines for Western Montana: Considering Invasive Weeds by Goodwin et al. 2006).

Burning is not an effective control because plants do not dry out well and large-scale burns can maintain a disturbed environment which favors Blueweed. Blueweed plants do not burn well, and after hand-pulling will likely require several days of air drying.

CHEMICAL CONTROL [Adapted from Graves et al. 2010]
Herbicides may be effective, especially when properly managed with other tactics. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Studies in Ravalli County, Montana found Metsulfuron at 1 ounce per acre or Chlorsulfuron at 1 ounce per acre applied to rosettes in the spring or fall provided nearly 100% control one year after treatment. These studies also found that Metsulfuron (0.5 ounce per acre) mixed with Chlorsulfuron at (0.5 ounce per acre) provided nearly 100% control one year after treatment.

Pasture formulations containing 2,4-D LVE (1-2 quarts per acre) successfully controlled Blueweed when applied to the rosette state during active growth. For complete control, several applications may be necessary.

BIOLOGICAL CONTROL [Adapted from Graves et al. 2010]
There are no biological control organisms established in the U.S. for use on Blueweed. However, in the eastern U.S. three insect species are known to feed on Blueweed: a lace bug (*Dictyla echii*), a moth (*Ethmia bipunctella*), and a chrysomelid beetle (*Longitarsus melanurus*). All have been observed to cause damage to plants. These species are not present in the western U.S., though related species of the moth and beetle are present in Montana.

Montana's Blueweed Task Force is led by Kellieann Morris who can be contacted at: (406) 777-5842 or kmorris@rc.mt.gov

Useful Links:

Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
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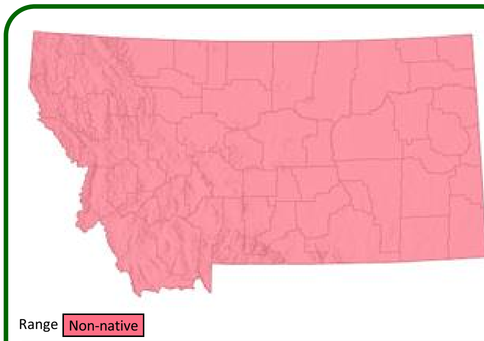
Weed Publications at Montana State University Extension - MontGuides

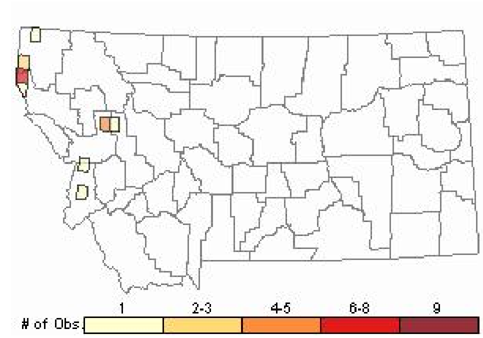
Scotch Broom
Cytisus scoparius

View in Field Guide

Noxious Weed: Priority 1B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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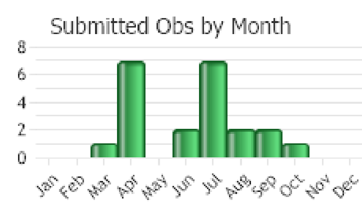

General Description

PLANTS: Perennial deciduous shrubs that grow to about 3 meters tall with a profusion of yellow flowers. Stems are green and strongly angled. Sources: Graves et al. 2010; Lesica et al. 2012.

LEAVES: Arranged alternately along the stem. The lower portions of stems have leaves composed of 3 leaflets that are nearly sessile (clover-like). The upper portions of stems may have leaves that are simple (1 blade). The leaflets are elliptic but widest above their middle, 6–15 mm long, have a pointed tip with smooth (entire) margins, and lack stipules. Leaflets are sometimes hairy. Sources: Graves et al. 2010; Lesica et al. 2012.

INFLORESCENCE: Bright, yellow flowers occur in long, terminal racemes or as 1 to 3 flowers in the axils of leaves. Sources: Graves et al. 2010; Lesica et al. 2012.

Phenology

Flowering in spring and seed dispersal occurring from mid-July to mid-August.

Diagnostic Characteristics

Scotch Broom is identified by the combination of these characteristics:
* true shrubs with bright yellow flowers,
* clover-like leaves (1-3 leaflets) that lack a petiole (leaf stem) and stipules,
* square stems with no spines, and
* pods that turn black with hairs that only occur along the suture.

Amorpha, Robinia, Dalea, or ***Caragana*** are shrubs also in the Pea Family, but they lack bright yellow flowers and have at least five leaflets pinnately arranged.

Thermopsis rhombifolia and ***Thermopsis montana*** **[Golden Pea]**:
* robust forbs that can appear woody at their base,
* showy yellow flowers that grow in leaf axils and terminal on banch-ends.
* clover-like leaves that have 3-leaflets, a petiole (stem), and a stipule.
* have two types of stipules: Stipules on the lower stems are brown and paper and grow at leafless nodes. Stipules on the upper stems occur at the leaf node, are green, and resemble leaflets.

Although not currently known in Montana the closest look-alikes are:
* **Portuguese Broom**(*Cytisus striatus*) has bright yellow flowers and hairy seed pods.

* **White Spanish Broom**(*Cytisus striatus*) has white flowers and hairy seed pods.
* **Gorse**(*Ulex europaeus*) has shiny, bright yellow flowers and nasty spines.

Habitat

Shrubs grow in disturbed areas, particularly along moist roadsides and in utility right-of-ways, pastures, open forests, gravel pits, and cultivated fields (Graves et al. 2010; Lesica et al. 2012). In other states it has also colonized undisturbed shrubland, grassland, and forests below 4,000 feet elevation (Graves et al. 2010).

Management

Proper identification, early detection, and control of Scotch Broom in previously non-infested sites is the key to preventing the establishment of new colonies in Montana.

PREVENTION [Adapted from Graves et al. 2010]
Preventing spread is key to keeping a small distribution that can be eradicated in Montana. Seed dispersal must be prevented. Dispersal by humans should be eradicated by avoiding infested areas and cleaning vehicles before moving from infested to non-infested areas.

Proper identification is critical. New or potential sitings should be confirmed by contacting your local county extension agent, weed district coordinator, or State herbarium at University of Montana-Missoula, Montana State University-Bozeman, or Montana State University-Billings.

It is essential to properly manage forests, lawns, pastures, roadsides, and rangeland to maintain desirable plants in a healthy condition because land disturbances invite Scotch Broom.

PHYSICAL and CULTURAL CONTROLS [Adapted from Graves et al. 2010]
Mowing or cutting stems at the end of the summer has been found to significantly reduce re-sprouting and eventually populations if conducted repeatedly. Soil should not be disturbed or that will stimulate seed germination. A rotary mower twists stems off, but does not cut, and can control Scotch Broom but does not eliminate re-sprouting and can damage non-target plants.

Burning using multiple prescribed fires can effectively control Scotch Broom. Burning is more-effective when done in mid-summer as new plants are sprouting. A high-intensity burn followed 2-3 years later by a low-intensity burn can provide long-term control. Higher intensity burns are needed to kills seeds, but may make it hard for establishing desirable vegetation, creating habitat for weed species. Burning trials conducted on French Broom (*Genista monspessulana*) in New Zealand and Australia found burning increased seed germination.

Revegetation may be necessary for disturbed areas in order to develop healthy, desirable vegetation. Herbicide application followed by re-seeding of desirable plants may be necessary.

GRAZING CONTROL [Adapted from Graves et al. 2010]
Scotch Broom is toxic to cattle, but has not been reported for goats or llamas. In a field trial in British Columbia, Canada sheet would not eat Scotch Broom. On the contrary in New Zealand, goats grazing shrubs for several seasons has successfully controlled Scotch Broom.

CHEMICAL CONTROL [Adapted from Graves et al. 2010]
The seed bank may make it necessary to apply herbicides after re-seeding or planting tree saplings. Repeated treatments may also be necessary. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Glyphosatewith a non-ionic surfactant (1.25-1.5 % solution) can be applied to fully-developed leaves to control established plants.

During active plant growth, 2,4-D plus Triclopyr can be used as a broadcast application (1.5 gallons per acre) or as a high-volume foliar application (1-1.5 % mixture). Triclopyr or Picloram can be used at label rates for either rnon-crop (pasture or rangeland) or forest preparation.

BIOLOGICAL CONTROL [Adapted from Graves et al. 2010]
In Montana no bio-control insects are known to occur.

In the 1970s and 1980s the Twig-boring Moth (*Leucoptera spartifoliella*) and a Seed Weevil (*Exapion fuscirostre*) were released in California for Scotch Broom control. The Twig-boring Moth is subject to insect parasitism. The Seed Weevil larvae consumes seeds, but does not negatively impact shrubs.

A Broom Seed Beetle (*Bruchidius villosus*) was released in Oregon. The adults feed on pollen while the larvae feed on seeds inside the pods.

Montana's Scotch Broom Task Force is led by Kellieann Morris who can be contacted at: (406) 777-5842 or kmorris@rc.mt.gov

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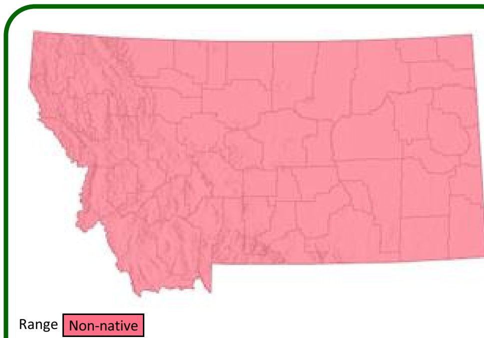
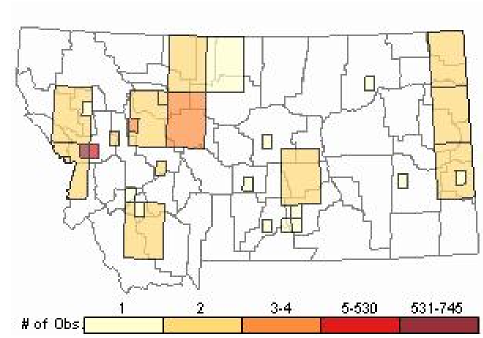
Common Buckthorn
Rhamnus cathartica

View in Field Guide

Noxious Weed: Priority 2A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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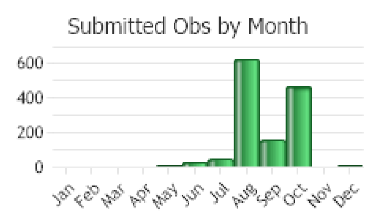

General Description

PLANTS: Large shrubs or small trees that have deciduous leaves and grow 2-6 meters tall. Twigs sometimes end in thorns. Source: Lesica et al. 2012

LEAVES: Both alternate and opposite leaf and bud arrangement can be found on the plant. Young twigs often have opposite or sub-opposite leaf arrangement. Leaf blades are simple, oval, dark green, and glossy. Leaf blades have 3-6 pairs of veins that arc from the mid-vein towards the leaf tip. Leaf margins are finely-toothed. Source: Lesica et al. 2012; Davis and Mangold 2018.

INFLORESCENCE: Plants are either male or female (dioecious). Female plants bear fruit. Female flowers are green, not showy, and have 4 sepals of 1-3 mm long that are longer than the erect petals. Fruits are a 4-seeded drupe, berry-like, and purplish-black at maturity. Source: Lesica et al. 2012; Davis and Mangold 2018.

The genus *Rhamnus* comes from the Greek word *rhamnos* meaning prickly shrubs, such as buckthorn (FNA 2016).

Phenology

April through June (FNA 2016).

Diagnostic Characteristics

Common Buckthorn – *Rhamnus cathartica*, exotic and Noxious:
* has both alternate and opposite to sub-opposite leaves and buds.
* Leaf blades have 3-6 pairs of veins that arc from the mid-vein towards the leaf tip.
* Leaf tips gradually narrow to a pointed tip.
* Flowers have 4 sepals and petals.

Cascara False Buckthorn – *Frangula purshiana*, exotic:
* has both alternate leaves and buds.
* Leaf blades have more than 8 pairs of parallel veins that angle from the mid-vein to the leaf margin.
* Leaf tips abruptly narrow to a short acuminate tip.
* Inflorescence has 4-40 flowers. Flowers have 5 sepals and petals.

Alderleaf Buckthorn – *Rhamnus alnifolia*, native and desirable:
* has both alternate leaves and buds.
* Leaf blades have fewer than 8 pairs of parallel veins that angle from the mid-vein to the leaf margin.
* Leaf tips are rounded to acute to abruptly short acuminate tip.
* Inflorescence has 2-5 flowers. Flowers have 5 sepals and petals.

Common Chokecherry – *Prunus virginiana*, native and desirable:
* has both alternate leaves and buds.
* Leaf blades have somewhat parallel veins that angle from the mid-vein, but arc near the leaf margin.
* Leaf blades are similar in shape, have finely toothed margins, and gradually narrow to a pointed tip.
* On the leaf petiole, but below the blade are two bumps (raised glands).
* Flowers are arranged in a 3- to 6- inch long raceme, which is conspicuous in the axils of the leaves. Flowers have 5 noticeable, white petals.

Habitat

In Montana, Common Buckthorn grows in fields, vacant lots, roadsides, fence rows, and riparian corridors in the plains and valleys (Lesica et al. 2012; Davis and Mangold 2018). It is more abundant in urban areas and adjacent forests (Davis and Mangold 2018). It grows best in moist areas that are not saturated, but have full sun to partial shade, such as along the edge of a forest (Davis and Mangold 2018). It also requires alkaline soils (Davis and Mangold 2018).

Management

Common Buckthorn was added to the Montana noxious weed list in 2017 (Davis and Mangold 2018).

Proper identification, early detection, and eradication is the best way to prevent Common Buckthorn from establishing. Large infestations are difficult to control. Methods should focus on controlling female shrubs which bear fruit and are responsible for dispersal. Control methods usually involve both mechanical and chemical methods. When prioritizing, sites with low-densities should be targeted because they are less costly to recover, are more likely to be returned to a native-dominant habitat, and efforts will aid in reducing spread by seed production (Davis and Mangold 2018).

PREVENTION
Landowners should frequently monitor their land for new infestations and, when found to implement effective control methods.

PHYSICAL and CULTURAL CONTROLS [Adapted from Davis and Mangold 2018]
Hand-pulling or mowing can be done on seedlings with stems up to 1.5 inches in diameter. Mowing will not kill plants.

Prescribed burning can kill plants, but will likely not eliminate plants. Spring burns can kill first-year seedlings and may eliminate established plants depending upon the burn (Panke and Renz 2012). However, burning also stimulates germination from the seed bank. Repeated burning or burning in combination with herbicides may be more effective. A 5-second exposure of flame around the stem with a propane torch will kill plants with a diameter of up to 2-inches (Panke and Renz 2012).

GRAZING CONTROLS
Currently information is unknown.

CHEMICAL CONTROLS [Adapted from Davis and Mangold 2018]
The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Consult your County Extension Agent and/or Weed District for more information on herbicidal control. Chemical information is also available at Greenbook.

It is recommended that foliar applications of herbicides be applied in the late fall to reduce negative impacts to native and/or desirable vegetation and wildlife. Foliar applications of glyphosate, triclopyr, or mixed tripclopyr and 2,4-D have been used on dense stands of small individuals.

Glyphosate is a systemic herbicide that will kill the root system, but it also is not selective and can kill all plants.

For large female shrubs with stems greater than 6 inches in diameter, control can occur by cutting and applying an herbicide. Stems that are girdled or cut, but not herbicided will develop new shoots. In riparian areas, female shrubs can be cut and piled. If there are fruits the pile should be burned to prevent seed dispersal. Additional chemical information used in the mid-west can be found at Panke and Renz 2012.

BIOLOGICAL CONTROLS
Currently no biological control agents are available.

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
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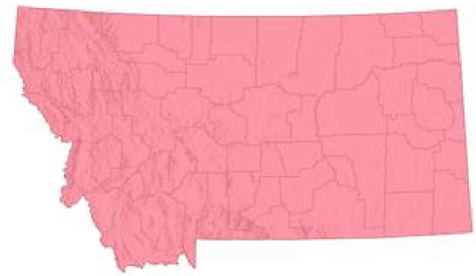
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

Ventenata
Ventenata dubia

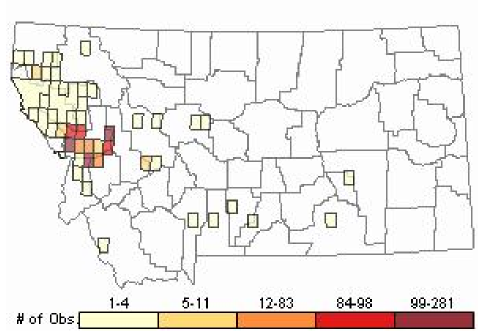
View in Field Guide

Noxious Weed: Priority 2A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0



Range Non-native



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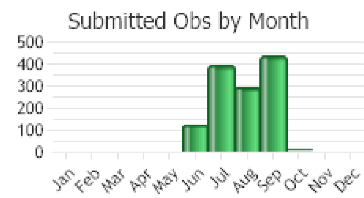

General Description

Cool season, annual bunchgrass. Stems few-bunched, 50–70 cm. Leaves: blades 1–3 mm broad, inrolled and ascending; sheaths with overlapping margins; ligule membranous. Inflorescence an open panicle, 2–4 dm long, only the very distal branch ends bearing spikelets. Spikelets 6–10 mm long, mostly with 3 florets, callus of spikelet well developed, glumes distinctly ribbed or veined, enveloping the florets. Lemmas dimorphic; the lowermost staminate and persistent straight awn; the upper lemmas fertile and with a bent and twisted awn, readily disarticulating; callus bearded; palea well developed. Disarticulation above and below glumes; unit of dispersal the floret (Lavin in Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

See video on identifying Invasive Annual Grasses in Montana. Also see video on Identifying Ventana early in the season.

Habitat

Sporadic in MT along roadsides and pastures and range with a significant disturbance history (Lavin in Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Management

Useful Links:
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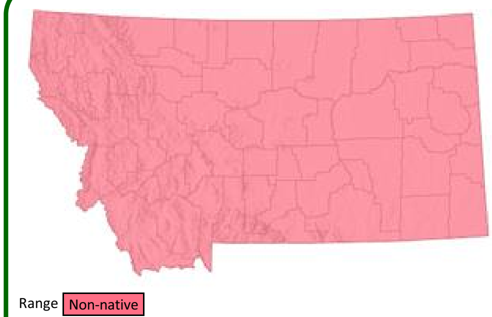
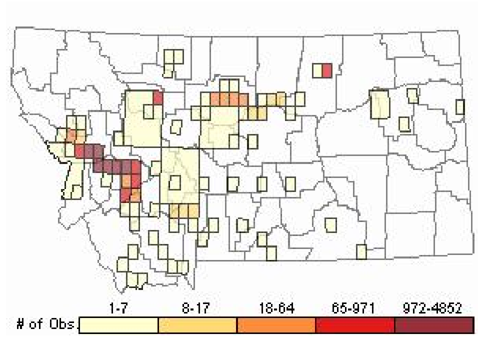
Perennial Pepperweed
Lepidium latifolium

View in Field Guide

Noxious Weed: Priority 2A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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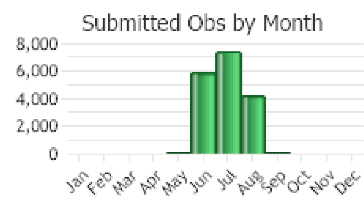


General Description

PLANTS: Rhizomatous perennial forbs with stiff stems that grow erect, branch above the ground, and are 40-100 cm tall. The lower stems are semi-woody. Plants lack hairs (Lesica et al. 2012) though the Flora of North America (FNA 2010) states they can be pubescent. Sources: FNA 2010; Lesica et al. 2012

LEAVES: Leaves are bright green to grey-green. Basal leaves are petiolate with narrowly oval-shaped blades that have toothed (serrate) margins and are 1-9(14) cm long. Basal leaves wither by flowering time. Stem leaves are alternately arranged with short petioles becoming sessile. Stem blades are oblong to elliptic-ovate or lanceolate, 2-9 cm long by 3-45 mm wide with a cuneate base (that is not auriculate) and with entire to serrate margins. Sources: FNA 2010; Lesica et al. 2012

INFLORESCENCE: Flowers are clustered in branched racemes. Flowers have 4 white petals of 1.5–2 mm long, 4 greenish-white sepals of 1-1.4 mm long, stamens 6 (4 long and 2 short), and 1 pistil. Sources: FNA 2010; Lesica et al. 2012

Phenology

Flowering June through September (FNA 2010).

Diagnostic Characteristics

There are many white-flowered species in the Mustard Family, both native and exotic. It is recommended that identifications be made using a plant manual designed for Montana. Mustards have flowers with 4 sepals, 4 petals, and 6 stamens (4 long and 2 short) among other characteristics.

Perennial Pepperweed – *Lepidium latifolium*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous or sparsely pilose (long soft hairs) with a very short style of 0.1 mm long or less. Silicle stems (pedicels) are 2-5 mm long.
* Stem leaves are sessile, but do not clasp around the stem.

Whitetop – *Lepidium draba*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous (lack hairs), flattened, and their base is cordate (heart-shaped or indented). Silicles are tipped with a style of 1-1.5 mm long. Silicle stems (pedicels) are 5-12 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

Globe-podded Whitetop – *Lepidium appelianum*, exotic:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not

notched at their tip.
* Silicles are pubescent (have hairs), inflated (globe-shaped), and with a short style of 0.4-1.0 mm long. Silicle stems (pedicels) are 4-11 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

Lenspod Whitetop – *Lepidium chalepense*, exotic:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous (lack hairs), partially inflated and round (compressed-globose), not cordate (is pointed to its stem), and topped with a style 1-2 mm long. Silicle stems (pedicels) are 8-15 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

The other Montana ***Lepidium*** species (using MTNHP preferred name) have mature silicles with a notch of at least 0.1 mm deep at their top and are not rhizomatous.

Hoary False-alyssum – *Berteroa incana*, exotic and Noxious:
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are not notched at their tip.
* Each of the 4 petals are notched, making the flower appear 8-petaled.
* Plants have star-shaped hairs; whereas, *Lepidium* species have simple hairs or none.
* Stem leaves are widest near their tip (oblanceolate), sessile on the stem, and point upwards.

Field Pennycress – *Thlaspi arvense*, exotic:
* Easily differentiated if in fruit and easily confused with other species if only of leaves.
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are large, deeply notched at their tip, flat, and with wide wings, resembling a penny.
* Lower stem leaves have petioles. Upper stem leaves are sessile, clasping, auriculate (lobed like an arrow), and with smooth to toothed margins.

Common Yarrow – *Achillea millifolium*, native and desirable:
* Member of the Aster/Sunflower Family.
* Bright-white flowers arranged closely in a flat-topped inflorescence.
* Leaves are 2-3 times pinnately dissected, appearing fern-like or bushy like a squirrel's tail.

Sources: Jacobs and Mangold 2007; FNA 2010; Graves-Medley and Mangold 2011; Lesica et al. 2012.

Habitat

In Montana Perennial Pepperweed grows in riparian areas that are moist or periodically flood, but can adapt to drier upland conditions (Jacobs and Mangold 2007). It can grow along lake shores and in riparian areas, wetlands, fields, pastures, grasslands, rangelands, roadsides, and urban areas in valleys (Jacobs and Mangold 2007; Lesica et al. 2012).

Management

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed. An integrated weed management strategy promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of Perennial Pepperweed possible (Shelly et al. *in* Sheley and Petroff 1999).

PREVENTION
Preventing vehicles from driving through and animals from grazing within infested areas will reduce spread. Hay that is weed-free will reduce spread. Maintaining an intact plant community and reducing soil disturbance will prevent or slow down spread.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs and Mangold 2007]
Hand-pulling can be effective for small populations or to eliminate re-growth from a herbicide treatment. Its rhizomatous growth makes it difficult to pull the entire root stem and will stimulate re-growth plus any fragments can re-sprout. Pulled plants must be bagged, dried, and disposed of in the trash, but should really be burned to truly prevent spreading it.

Mowing has been shown to reduce Perennial Pepperweed by 46% for one year. Mowing should occur at the first signs of flowering and at a stubble height of 4 inches or greater. The root's carbohydrate reserve is at its lowest when the plant begins to flower. A stubble height of at least 4 inches should remove flowers and buds while allowing desirable plants to better survive. Do not mow if plants are in seed because that will increase spread. However, plants will re-sprout and could flower and repeated mowing is likely necessary. A more effective control is to combine mowing with an herbicide treatment.

Tilling will fragment the rhizomes and increase re-sprouting. Repeated tilling without or in combination with an herbicide treatment may control Perennial Pepperweed.

Revegetation that is timed properly with the appropriate desirable plants can create competition to suppress or to prevent re-invasion by Perennial Pepperweed. The Plant Materials Technical Note 46, "Seeding Rates and Recommended Cultivars" and the Extension Bulletin EB19, "Dryland Pasture Species for Montana and Wyoming" might be useful for your project.

CHEMICAL CONTROLS [Adapted from Jacobs and Mangold 2007]
Herbicides are effective, especially when properly integrated with intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Perennial Pepperweed has been suppressed for 1-2 years using:
* Metsulfuron at the 1.0 ounce per acre rate applied to actively growing plants before full bloom. A nonionic surfactant is needed.
* Chlorsulfuron at the 1.0 ounce per acre rate applied when plants are in flower bud to early flowering. A nonionic surfactant is needed.
* Imazapic at the 8-12 ounce per acre rate mixed with methylated seed oil at the 1 quart per acre MSO rate applied after plants are in full bloom.

2,4-D at the rate of 2 quarts per acre will kill stems, but not the root crowns. Root crowns will re-sprout and require a different follow-up treatment.

Glyphosate at the rate of 2 quarts per acre will kill all plants (broad-leaf and grass plants).

GRAZING CONTROLS [Adapted from Jacobs and Mangold 2007]
Cattle and sheep can control Perennial Pepperweed in stands that are not dense. One study found Perennial Pepperweed was reduced in a pasture by 78% for one year. Sheep grazing has reduced Perennial Pepperweed plants without reducing native plant species. Perennial Pepperweed seeds remain viable after passing through the digestive tract. In fact, germination rates increased by 5% to 40% for ingested seeds. Animals that have grazed in areas with Perennial Pepperweed should be contained and fed weed-free forage for 5 days before moving into weed-free areas.

Poisoning has been reported for horses feeding on Perennial Pepperweed contaminated hay.

BIOLOGICAL CONTROLS
There are no biological controls available because Perennial Pepperweed is a member of the mustard family, which includes numerous important crops (cabbages, broccoli, mustard, canola, and others).

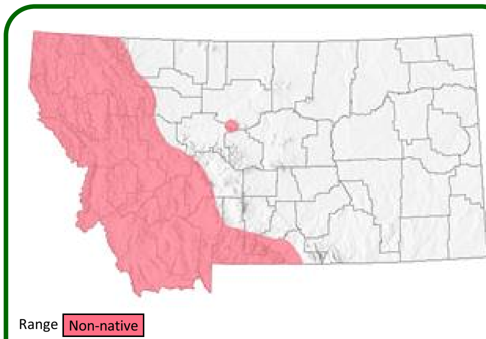
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

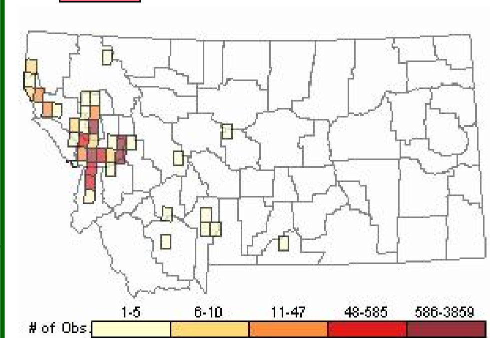
Yellowflag Iris
Iris pseudacorus

View in Field Guide

Noxious Weed: Priority 2A
Aquatic Invasive Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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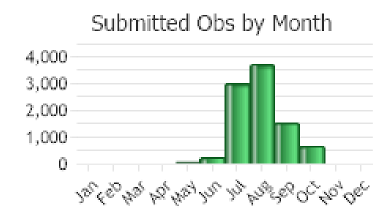


General Description

PLANTS: Herbaceous perennials that grow from 1 to 1.5 meters tall with showy flowers and thick rhizomes (DiTomaso and Healy 2003). Stems are clumped (Lesica 2012). Rhizomes are up to 5 inches wide, have black sap, and produce roots that range from 4 to 12 inches long (Jacobs et al. 2011).

LEAVES: Each plant has up to several equitant leaves that fold in half length-wise and enclose the base of the next higher leaf (Jacobs et al. 2011; Lesica 2012). Thus, leaves emerge from the ground resembling a spreading fan (Jacobs et al. 2011). Each leaf resembles a sword's tip, and is from 50-100 cm (20-40 inches) tall and 10-30 cm (0.4-1.2 inches) wide.

INFLORESCENCE: An erect raceme of 3-10 yellow flowers, that branches in its upper portion (Lescia 2012). Bracts (spathes) are leaf-like, 4-7 cm long, and enfold the stem; the outer are keeled (Lesica 2012).

The genus name "Iris" is derived from Iris, the greek goddess of the rainbow and messenger to the gods (Ramey and Peichel 2001). The specific epithet name "pseudacorus" means false (pseud) sweet flag (Acorus) referring to the similarity with the genus Acorus (Ramey and Peichel 2001).

Phenology

Flowers bloom from May to July, and are pollinated by insects. Seeds are produced between July and October. Germination primarily occurs the following spring.

Diagnostic Characteristics

Montana has two *Iris* species: Rocky Mountain Iris (*Iris missouriensis*) and Yellowflag. The native Rocky Mountain Iris has a similar appearance, but develops 1-3 blue flowers and Yellowflag Iris has 3-10 yellow flowers. Both iris species occupy similar habitats. Rocky Mountain Iris grows in moist to wet meadows and irrigation ditches, but can tolerate drier conditions (thickets and woodlands). Yellowflag Iris requires moist to wetter habitats. In addition, Rocky Mountain Iris plants tend to be shorter (10-50 cm), have shorter (10-40 cm) and narrower (3-8 mm) leaves, and their rhizomes lack the black sap (Jacobs et al. 2011; Lesica 2012).

Cattail (Typha latifolia and T. angustifolia) leaves sheath at the base and appear similar when young, but their stems are round (not flattened).

Habitat

Disturbed wetland habitats: marshes, wet meadows, irrigation ditches, pond margins, and riparian areas in the valleys (Lesica 2012).

Management

Montana's Yellowflag Iris Task Force is led by Jed Little who can be contacted at: (406) 258-4220 or mapping@missoulaeduplace.org

Yellowflag Iris was introduced to North America as a horticultural plant. Many cultivars of this species have been developed (Tu 2003). Because of its growth form, Yellowflag Iris has been planted for erosion control and in sewage treatment ponds (Tu 2003). It has been used to collect sediment and to remove copper and iron heavy metals from wastewater (Tu 2003).

PREVENTION
It is a beautiful plant that will continue to be spread by gardeners, garden dealers, and sales on the internet until the sale of the species is banned. Preventing new infestations is the best means for controlling the plant. It is difficult to eradicate because it reproduces vegetatively and by seed, is adaptable to a wide range of moisture and soil conditions, and has few pests or predators (Tu 2003).

CHEMICAL CONTROL [Adapted from Tu 2003.]
Herbicides are effective at controlling populations. However, the type of herbicide, herbicide concentration, timing of chemical control, and other factors will determine its effectiveness. Always wear protective clothing designed for chemicals, follow chemical label instructions, and use restrictions. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Because it grows in or adjacent to water, an aquatic-labelled herbicide and adjuvant must be used. Glyphosate, under the trade names of Rodeo®, Aquamaster® or Glypro®, has been used successfully to kill Yellowflag Iris; however, plants are resistant to Terbutryne. Use Glyphosate in a 25 percent solution (13 percent a.i.) with a dripless wick/wiper applicator, or spray it using a 5-8 percent solution, and in combination with the appropriate non-ionic surfactant adjuvant. It is recommended to use a dye to better track sprays. The herbicide can be applied directly to leaves or to freshly cut leaves/stems. Spot-treat plants and do not broadcast spray in order to protect other native plants, animals, and water quality.

MECHANICAL CONTROL [Adapted from Tu 2003.]
Mechanical control is labor-intensive, but new or small patches can be controlled by physically removing the entire plant. It is essential to remove the entire rhizome, since small pieces of rhizome can re-sprout. Protective gear should be worn since resinous substances in the leaves and rhizomes can irritate the skin.

Mowing can provide control if done annually, but it will not remove the plant. Likewise, removing the flowers/fruits (dead-heading) will reduce its ability to spread, but will not kill the plant. Plants are poisonous if ingested by grazing animals.

BIOLOGICAL CONTROL [Adapted from Tu 2003.]
There are no known biological controls available for Yellowflag Iris. Many invertebrates and fungi do feed upon iris, and specific species are listed in the document, Element Stewardship Abstract for Iris pseudacorus L. by Mandy Tu of The Nature Conservancy (2003). In addition, the iris root rot called Pseudomonas iridis causes leaves to yellow and rhizomes to rot. However, none of these insects, fungi, or pathogen significantly kill plants or control populations.

CULTURAL [Adapted from Tu 2003.]
Prescribed fire is not recommended for controlling Yellowflag Iris. Plants grow in wet environments which are often poorly affected by fire and where other native plants are not adapted to fire. Rhizomes can re-sprout in response to low-severity fires.

Contact information for local county Weed District Coordinators can be found on the Montana Weed Control Association Contacts Webpage.

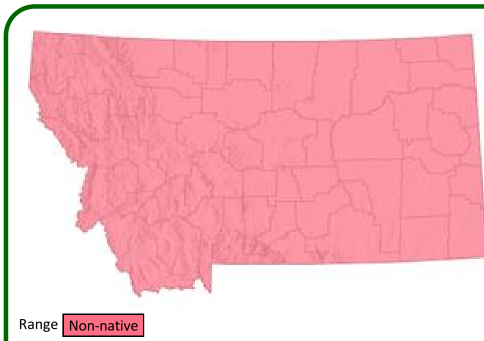
Contact information for Aquatic Invasive Species personnel:
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

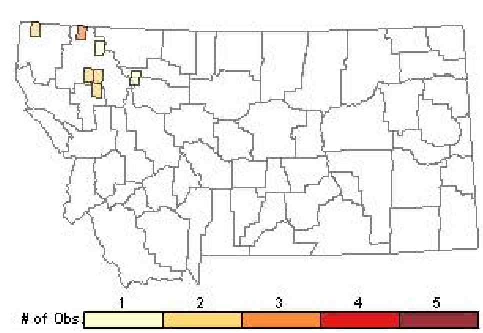
Kingdevil Hawkweed
Hieracium praealtum

View in Field Guide

Noxious Weed: Priority 2A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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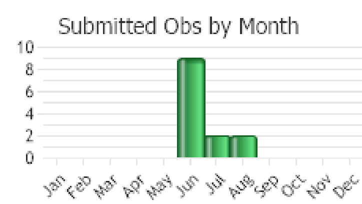


General Description

PLANTS: Fibrous-rooted from a short rhizome, often stoloniferous. Stems erect, simple, subscapose, 30–80 cm. Herbage glabrate to sparsely long-hirsute. Source: Lesica et al. 2012.

LEAVES: Mainly basal, short-petiolate; blades oblanceolate, 3–10 cm long, entire. Source: Lesica et al. 2012.

INFLORESCENCE: Heads 10 to 30; involucres narrowly campanulate, 6–9 mm high; phyllaries scarious-margined, linear-lanceolate, sparsely stellate-hairy, stipitate-glandular, setose-hirsute. Rays 60 to 80, yellow; ligules 4–6 mm long. Achenes 1–2 mm long; pappus white. Source: Lesica et al. 2012.

Diagnostic Characteristics

Montana has about 4 native and 3 exotic Hawkweeds. Their species identification can be complex and confusing because species interbreed to form hybrids and some populations are apomictic (seed are asexually produced).

Hieracium caespitosum, *Hieracium praealtum*, *Hieracium piloselloides*, and *Hiercium gracile* have yellow flower heads while *Hieracium aurantiacum* is our only Hawkweed with red-orange flowers heads.

Kingdevil Hawkweed (*Hieracium praealtum*) Villers ex Gochnat has leaves with lower surfaces that have stellate (star-shaped) hairs (FNA 2006). In Lesica's treatment in the Manual of Montana Vascular Plants (2012) our plants appear to better fit the description of *Hieracium praealtum* Villers ex Gochnatthen than of *H. piloselloides* Vill. or *H. floribundum* Wimm. & Grab. However, the Strother's treatment in the Flora of North America (2006) does not include *Hieracium praealtum* Villers ex Gochnat, but does recognize it might merit taxonomic recognition.

Meadow Hawkweed (*Hieracium caespitosum*) has florets with pappus bristles in 1 series (single ring of bristles). Its upper stems and involucres have dense glandular setae (hairs), but *Hieracium praealatum* has scattered glandular setae mixed in with non-glandular setae (Lesica et al. 2012). *Hieracium caespitosum* has short stolons (when they are present). *Hieracium praealatum* is more likely to have stolons and when present they are longer and slender.

Tall Hawkweed (*Hiercium piloselloides*) has leaves (upper and lower surfaces) that are lack both hair types of long, stiff hairs (piloso-hirsute) and stellate (star-like) hairs (FNA 2006). Leaves are glabrous or have one long, stiff hairs on the midribs and margins.

Alpine Hawkweed (*Hiercium gracile*)is a native plant of the subalpine and alpine habitats. Its florets have 2 series of pappus bristles. Plants also tend to be less than 30 cm tall.

Habitat

Roadsides, grasslands; valleys, montane (Lesica et al. 2012).

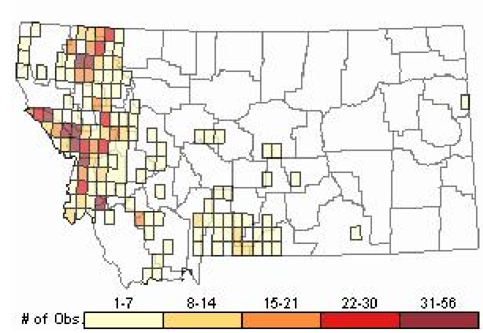
Management

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

Tall Buttercup
Ranunculus acris

Noxious Weed: Priority 2A
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0



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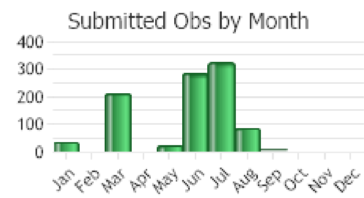


General Description

PLANTS: Perennial forbs with hirsute (straight, stiff hairs) foliage and erect stems 25–80 cm tall. Plants are rhizomatous. Source: Lesica et al. 2012

LEAVES: 40-50 basal leaves have long petioles, up to 20 cm, that each terminate into a single leaf blade. Basal leaf blades are 3-6 cm long and pentagonal (5-sided) in shape that are mostly deeply divided into about 3 palmate lobes that again deeply divided into 2-3 acute segments. Stem leaves resemble basal leaves, but alternately arranged and become smaller and sessile upwards. The upper stem leaves become reduced to 3- to 5-lobed bracts. Source: FNA 1997; Lesica et al. 2012; Jacobs et al. 2015.

INFLORESCENCE: Yellow flowers are arranged in diffuse, open cymes. The 5 sepals are symmetrical, greenish, bend downwards, and have soft, spreading hairs. The 5 petals are symmetrical, 8–10 mm long (twice as long as the sepals), buttercup yellow, and shiny. Source: FNA 1997; Lesica et al. 2012; Jacobs et al. 2015.

The genus *Ranunculus* comes from the latin words *rana* for frog and *unculus* for little, and is in allusion to the wet habitats in which some species grow (FNA 1997).

Phenology

May through September (FNA 1997).

Diagnostic Characteristics

Ranunculus and ***Potentilla*** can be look-alikes because some species exhibit symmetrical flowers composed of 5 green sepals and 5 bright yellow petals that surround many ovate achenes (fruits).

Ranunculus species are in Family Ranunculaceae. Flowers exhibit shiny yellow petals, sepals that are separated to their base, and lack bracts between the sepals. In generalizing and looking from a distance, plants don’t appear hairy and seem rather darker green and glossier. Achenes are beaked.

Potentilla species are in the Family Rosaceae. Yellow-flowered forbs tend to have matted yellow petals, sepals united at their base and at least partially united to the ovary (forming a hypanthium), and often have bracts between the sepals. In generalizing and looking from a distance, plants often appear hairy and lighter or dull green. Achenes are not beaked.

Tall Buttercup - *Ranunculus acris*, exotic and Noxious:

* Basal leaf blades pentagonal (5-sided) in shape that are mostly deeply divided into about 3 palmate lobes that again deeply divided into 2-3 acute segments. Ultimate leaf segments are more numerous.
* Beak of the achene is about 0.5 mm long.
* Sepals spread outwards.
* Collectively the fruits are globose in side-view.

Sharpleaf Buttercup - *Ranunculus acriformis*, native and desirable:
* Basal leaf blades are broadly ovate to cordate in outline, deeply 3-divided (ternate). Sepals reflexed. Ultimate leaf segments are less numerous.
* Beak of the achene is about 1mm long and more compressed.
* Collectively the fruits are hemispheric in side-view.

Habitat

In its native range, Tall Buttercup is common in damp meadows and pastures on calcareous or neutral soils (Jacobs et al. 2015). On the British Isles is grows on rock ledges, gullies, and occasionally on mountain top detritus (Jacobs et al. 2015). In the Netherlands is grows in floodplains along rivers, preferring areas with about 30 days of flooding per year (Jacobs et al. 2015).

In Montana, Tall Buttercup predominately grows in moist meadows and pastures, especially irrigated hay fields (Lesica et al. 2012; Jacobs et al. 2015). It is less abundant in wildland habitats (Lesica et al. 2012). It also grows along roads, along ditches and natural waterways, and in borrow pits and parking lots (Jacobs et al. 2015). It occurs in valleys and occasionally at higher elevations (Lesica et al. 2012).

Management

Tall Buttercup is predominately a weed problem in hay meadows and pastures. Successful management of Tall Buttercup requires that land-use objectives and a desired plant community be identified (Sheley and Petroff 1999). Once identified then an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of Tall Buttercup possible (Sheley and Petroff 1999).

PREVENTION
* Prevent vehicles from driving through and animals from grazing within infested areas,
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to an uninfested area,
* Encourage landowners to monitor their land for new infestations and, when found to implement effective control methods.
* Maintain proper livestock grazing management that maintains desirable, competitive vegetation.
* Develop educational campaigns to teach people to not pick and transport the buttercup flowers.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs et al. 2015]
Hand-pulling that extracts all the rootstock can be effective to temporarily reduce small infestations and scattered plants. It works best to eliminate new plants or those persisting after herbicide treatments. Rhizomes that remain in the soil will regenerate and follow-up hand-pulling or other controls will be needed. Pull new plants from rhizomes or the seed bank will reduce seed production.

Mowing can aid in reducing flowering/seed production if timed correctly with a frequency that promotes desirable plants to grow. Plants that are mowed will re-grow. Mowing that maintains an open site with little plant diversity will encourage Tall Buttercup to flourish.

Tilling is not recommended unless it is combined with an Integrated Weed Management plan. The disturbance caused by tilling allows rhizomes to re-sprout, seeds to germinate, and reduces plant competition, all of which favors colonization by Tall Buttercup.

Irrigation can promote Tall Buttercup because it prefers moist conditions and can tolerate flooding. However, an Integrated Weed Management plan that carefully manages irrigation with other control practices can be effective at reducing or eliminating Tall Buttercup. In irrigated and sub-irrigated pastures and hayland, properly timed irrigation can increase competitiveness from appropriate forage crops when also timed appropriately with fertilization and grazing and/or harvest practices.

Nutrient management with a judicious use of herbicides and crop rotation is recommended where Tall Buttercup invades non-native pastures and hay meadows. Applications of nitrogen, phosphorus, and potassium may reduce the abundance of Tall Buttercup where the growth of grasses can over-top and shade it. However, in disturbed settings fertilizers may have little effect on Tall Buttercup perhaps because high-light and/or low competition remains.

Prescribed burning is not commonly used in the moist habitats were Tall Buttercup grows. Fire can re-generate rhizomes and germinate seeds. However, fire is often used to retain vigor and density in grasslands because it reduces plant litter and releases nitrogen. Fire used in combination with other control methods might be appropriate to reduce Tall Buttercup populations.

GRAZING CONTROLS [Adapted from Jacobs et al. 2015]
Tall Buttercup contains glycoside ranunculin which if ingested by livestock can potentially be fatal. Livestock typically avoid Tall Buttercup. The palability of Tall Buttercup to sheep or goats is unknown.

Several studies from Finland, Iceland, and Great Britain suggest that Tall Buttercup increases with grazing. In these studies, litter removal, exposure of bare ground, and suppression of competitive grasses were thought to facilitate the increase of Tall Buttercup. However, a prescribed grazing management plan that uses livestock to promote the competitiveness of desirable forage plants will prevent Tall Buttercup invasion or re-invasion after weed control. In sites with Tall Buttercup spring grazing is not recommended because it will likely remove desirable plants, limiting their growth and ability to shade it out. In addition, Tall Buttercup exhibits its most leafy stage in the spring.

CHEMICAL CONTROLS [Adapted from Jacobs et al. 2015]
The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Consult your County Extension Agent and/or Weed District for more information on herbicidal control. Chemical information is also available at Greenbook.

Aminopyralid and dicamba herbicides have been used to control Tall Buttercup. The leafy phase prior to flowering stem development (late spring) is the optimal time to apply herbicides.

In New Zealand plants have become resistant to the phenoxy herbicide MPCA. To avoid the development of herbicidal resistant populations, integrate herbicidal control with other practices and use herbicides with different modes of action.

BIOLOGICAL CONTROLS [Adapted from Jacobs et al. 2015]
Currently no biological control agents are available.

Montana's Tall Buttercup Task Force is led by Margie Edsall who can be contacted at: (406) 842-5595 or medsall@madisoncountymt.gov

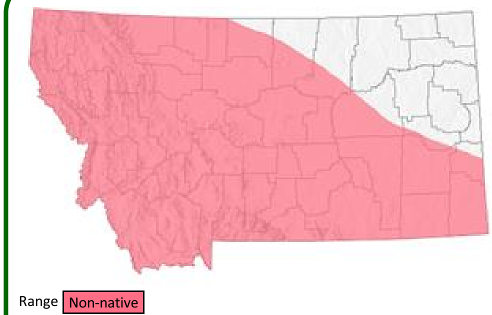
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

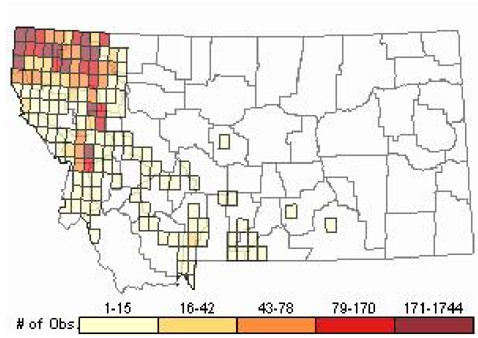
Orange Hawkweed
Hieracium aurantiacum

View in Field Guide

Noxious Weed: Priority 2A
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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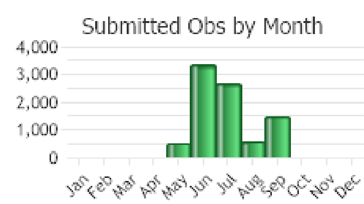


General Description

PLANTS: Perennial forbs with erect stems from 10-35 (70) cm tall that are rhizomatous and stoloniferous. Rhizomes have fibrous-roots. Stems are single (simple). Stems have stiff hairs (hirsute) of 2-4+ mm that may become shorter and stipitate-glandular upwards. Sources: FNA 2006; Lesica et al. 2012.

LEAVES: 3-8 basal leaves and 0-1 stem leaf. Basal leaves 3-15 cm long, petiolate, blades spatulate to oblanceolate, margins entire, and tips acute. Leaf surfaces with stiff hairs (hirsute) of 1-2+ mm long and stellate-pubescent.

INFLORESCENCE: More-or-less umbelliform. Burnt orange flower heads of 3 to 12, clustered, and pedunculate with stellate pubescence and stipitate-glandular hairs. The involucres are campanulate, 5–9 mm high. The involucral bracts (phyllaries) are linear-lanceolate with acuminate tips, and are stellate-hairy, stipitate-glandular, and sparsely setose-hirsute. Flower heads composed of 25 to 100 florets with petals red to orange, 6–8 mm long. The pappus are white bristles of 3.5-4 mm long. Fruits (cypselae) are columnar, about 2 mm long, and retain the tuft of bristles (pappus).

Phenology

Flowering May – September (FNA 2006).

Diagnostic Characteristics

Montana has about 4 native and 3 exotic species of hawkweeds.

Orange Hawkweed is the only hawkweed in Montana with red-orange flower heads. Flower heads are composed of only ray florets.

Orange Agoseris *Agoseris aurantiaca* also has orange to pink, ligulate flower heads, but the plants are not hirsute hairy and the basil leaves are larger and oblanceolate. It grows in meadows and rocky slopes.

Habitat

Disturbed soil of forest openings, rock slides, roadsides, lawns; valleys to lower subalpine (Lesica et al. 2012).

Management

PREVENTION [Adapted from Sheley and Petroff 1999]
Successful management seeks to prevent infestations and detect them before the patch spreads vegetatively.

Large infestations are difficult to control. Using multispectral, digital images may identify infestations in remote areas better than visual surveys over large areas (refer to Carson et al. 1995).

CHEMICAL CONTROL

The Phenoxy-type herbicides (2,4-D, clopyralid, and picloram) are effective in controlling orange and meadow hawkweeds when applied to the rosette stage and used with a surfactant (Wilson and Callihan *in* Sheley and Petroff 1999). The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Greenhouse and field studies conducted in southern Alaska by the Agricultural Research Service examined the effectiveness of aminopyralid, clopyralid, picloram, picloram+chlorsulfuron, picloram+metsulfuron, and triclopyr herbicides in controlling orange hawkweed (Seefeldt and Conn 2011). Only aminopyralid at 105 g ai/ha and clopyralid at 420 g ai/ha controlled orange hawkweed consistently, with peak injury observed one year after treatment. Clopyralid had less impact on non-target species with most recovering the year after treatment. In a pasture system, where grasses are preferred to forbs and shrubs, aminopyralid is preferred because it controls a broader array of forbs compared to clopyralid. In natural areas, where the desire is to retain biodiversity and the aesthetics of multiple forb, grass, and willow species, clopyralid is preferred because it will leave a greater species diversity than aminopyralid.

Researchers at the University of Idaho found more than a 50% control of hawkweed using clopyralid at the rate of 0.5 lb ai/ac (Wilson and Callihan *in* Sheley and Petroff 1999). A similar control was found using picloram at the rate of 0.2-0.5 lb ai/ac.

A combination of fertilizers and herbicides applied to areas where hawkweed is mixed with perennial grasses, legumes, and other forbs can reduce spreading (Wilson and Callihan *in* Sheley and Petroff 1999). Fertilizer treatments reduced hawkweed density and vigor in the U.S., Canada, and New Zealand. Depending upon soil productivity and grass condition, fertilizers can promote the growth of desirable plants which may become competitive enough to suppress hawkweed growth.

CULTURAL & GRAZING CONTROLS [Adapted from Wilson and Callihan *in* Sheley and Petroff 1999]

Hand-pulling and mowing are not effective control measures. Physical disturbance to orange hawkweed severs roots, stolons, and/or rhizomes causing the plant to further spread. Mowing may remove flowering stems and reduce seed production but will not hinder growth by the stolons or rhizomes. Soils disturbed by livestock, rodents, or people can also enhance the plant to spread.

BIOCONTROL [Adapted from Wilson and Callihan *in* Sheley and Petroff 1999]

In 1995 the USDA Agricultural Research Service in Bozeman, Montana began to develop the feasibility of a biological control program for orange and meadow hawkweeds. However, biological control for these plants has not yet successfully been developed in the U.S.

Useful Links:

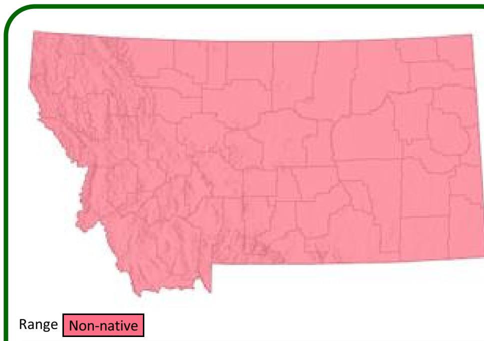
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

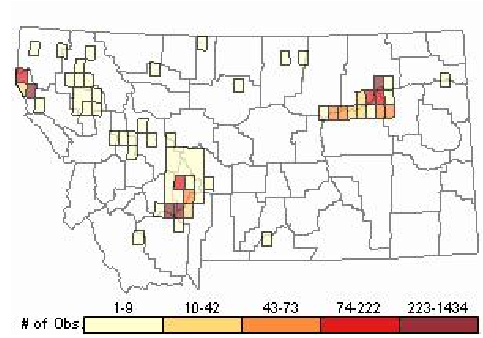
Eurasian Water-milfoil
Myriophyllum spicatum

View in Field Guide

Noxious Weed: Priority 2A
Aquatic Invasive Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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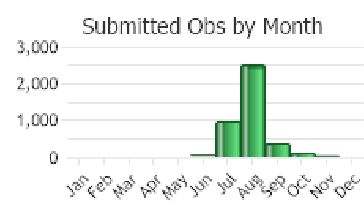


General Description

PLANTS: Aquatic perennials with rhizomes and finely dissected, whorled leaves. Stems are branched and tawny colored when dry. Wintering buds (turions) are absent. Sources: DiTomaso and Healy 2003; Parkinson et al. 2011.

LEAVES: Submerged leaves are well-develop, in whorls of 4 to 5, and to 25 mm long. Each submerged leaf is pinnately divided into 24 to 50 linear segments. Emerged leaves are actually bracts; they are small, grow during flowering (or when water levels recede), occur below the flowers, and are oppositely arranged. Sources: DiTomaso and Healy 2003; Lesica et al. 2012.

INFLORESCENCE: Terminal spike of 4-8 cm long that grows erect above the water (emerged). The spike consists of separate male and female flowers growing in the axils of oppositely arranged leaf-like bracts. Sources: DiTomaso and Healy 2003; DiTomaso and Healy 2003.

Phenology

Flowering in Montana has been observed from July through September.

Diagnostic Characteristics

Montana has 1 exotic and 3 native Water-milfoil species. Their identification requires a close examination and users should consult either the *Manual of Montana Vascular Plants* (Lesica et al. 2012) or *Flora of the Pacific Northwest-2nd Edition* (Giblin et al. [eds] 2018).

Eurasian Water-milfoil - *Myriophyllum spicatum*, exotic, noxious, invasive:
* Combination of flowering spikes with emergent leaves less than 4 mm and whorled submerged leaves with 14 to 24 pairs of segments that ascend.
* Submerged leaves have linear segments that are mostly equal in length.
* Vegetative shoot tips are often dense.
* Plants readily collapse when removed from water.
* Turions (cylinders or balls of small leaves) are absent.

Common Water-milfoil - *Myriophyllum sibiricum*, native, desirable:
* Combination of flowering spikes with emergent leaves less than 4 mm and whorled submerged leaves with 4 to 16 pairs of segments that mostly spread or are perpendicular to the apex.
* Submerged leaves are often in whorls of 4 with 6-16(-24) segments. Segments spread or lay perpendicular to the rachis at base, but may ascend towards the apex.

* Plants remain stiff when removed from water.
* Lower pair of segments are longest and gradually shorten towards the leaf tip.
* Turions present: dark green, broadly cylindrical, composed of reduced and thickened leaves, and may remain persistent on next year's new growth.

Hybrid Eurasian X Common Water-milfoil, exotic, noxious, invasive:
Historically, the relationship of *Myriophyllum spicatum* and *Myriophyllum sibiricum* has been unclear, but recent treatments indicate they are unique species. Where both species are present, the populations can intergrade producing hybrids with intermediate characteristics (DiTomaso and Healy 2003). Genetic testing is necessary when morphological characteristics are in doubt (Thum personal communication). In Montana the hybrid has been found in waterbodies where both species occur and will grow invasively. Hybrids have not been found in water bodies that lack one of these species, indicating they are self-reproducing (Thum personal communication). Herbicides that traditionally control Eurasian Water-milfoil are not effective on hybrid plants (Thum personal communication).

Whorled Water-milfoil - *Myriophyllum verticillatum*, native, desirable:
* Emergent leaves are longer than the flowers and fruits and pinnately divided or lobed more than half-way to mid-vein.
* Flowers have 8 stamens.
* Submerged leaves are generally in whorls of 4, often with 12-22 segments.
* Fruit segments are round(-ish) with shallow, longitudinal ridges and no wings or cross-ribs.
* Turions present (balls of small leaves that develop from tips of vigorous vegetative shoots): brown to red-brown and 1-5 cm long.

Common Hornwort - *Ceratophyllum demersum*, native, desirable:
* Submerged leaves have linear-forked segments that whorl around the stem. They are not pinnately divided (no central mid-rib).
* Flowers are submerged, but usually plants are sterile and reproduction is mostly by overwintering turions (Lesica et al. 2012).

Habitat

Open water of reservoirs; valleys (Lesica 2012). It tolerates moving water and wave action facilitates fragmentation (Parkinson et al. 2011).

Management

Eurasian Water-milfoil spreads primarily through plant fragments on boat trailers, recreational equipment, and waterfowl. It can also disperse between water bodies by wind and water flow. Following introduction, populations expand rapidly and may be undergo cycles of dominance and dieback.

DETECTION [Adapted from Newton et al. 2016]
A traditional polymerase chain reaction (PCR) assay was developed to detect pure and hybridized Eurasian Water-milfoil. In 2013 a pilot study tested its use in the laboratory and at four sites in Jefferson Slough, Jefferson County, Montana and Half Moon Lake, Michigan. Results showed that the environmental DNA (eDNA) PCR assay was able to detect both pure and hybridized Eurasian Water-milfoil. The research recommended that further studies to refine the sensitivity of the assay be conducted. The technique of using eDNA for early detection of Eurasian Water-milfoil is possible.

PREVENTION [Adapted from Parkinson et al. 2011]
* Thoroughly rinse any mud and debris from all equipment and wading gear, and drain the water from the boat before leaving access areas. Pump the bilge before entering another water body as Eurasian Water-milfoil can remain alive in bilge water for several days. Use boat-washing stations when available.
* Remove all plant fragments from the boat, propeller, and boat trailer. Fragments as little as 1-inch long with two nodes are able to root and colonize.
* Dry boats and equipment for 5 days before transporting them to a new water body.
* Do not dispose aquarium water or plants into water bodies.
* Desiccate plant material and/or dispose by securely sealing in plastic bags and placing in the trash for disposal.
* Learn to identify Eurasian Water-milfoil and report findings to the Montana Department of Agriculture; Montana Fish, Wildlife and Parks; County Extension agent; or Weed Coordinator.

CHEMICAL CONTROL [Adapted from Parkinson et al. 2011]
Diquat, Endothall, 2,4-D, Triclopy, and Fluridone have been used to herbicide Eurasian Water-milfoil plants in

water bodies. Native water-milfoil are also susceptible to some of these herbicides. The herbicide concentration, exposure time before dissipating, timing of chemical control, and other factors are critical to effectively hinder Eurasian Water-milfoil and reduce impacts to native vegetation – see Parkinson et al. 2011, and always follow chemical label instructions and use restrictions. These herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

MECHANICAL CONTROL [Adapted from Parkinson et al. 2011]
Raking and hand-harvesting can be effective for controlling small populations or early infestations. However, the risk of spread by fragmenting the plants is very high. Fragment barriers around harvest operations have been developed. All plant material should be bagged and desiccated before placing in the trash for disposal. Single harvests should be done when biomass is at its peak. It is recommended to harvest several times during the growing season, and for consecutive years. Areas harvested once can re-generate.

PHYSICAL CONTROL [Adapted from Parkinson et al. 2011]
Benthic barriers are mats laid down on the floor of the water body around docks and other high-use areas. They prevent light from penetrating and prevent plants from rooting. They are usually effective, but kill all vegetation. They are removable once the infestation has been destroyed. Barriers must be monitored because sediment will accumulate and provide a substrate for Eurasian Water-milfoil to colonize. Plants can root in 4 cm (1.5 inches) of soil.
Drawdowns lower the water levels to expose plants. This method has been effective at killing plants and reducing infestations when timed with freezing temperatures for 96 hours. This control may require extensive planning and permitting, and may hurt non-targeted vegetation and animal life.

BIOLOGICAL CONTROL [Adapted from Parkinson et al. 2011]
Two insects are being studied for their ability to control Eurasian Water-milfoil: Watermilfoil Moth (Acentria ephemerella) [native to Europe] and milfoil weevil (Euhrychiopsis lecontie) [native to North America].

CULTURAL CONTROL [Adapted from Parkinson et al. 2011]
Non-native water-garden plants should never be dumped near to or within wetlands, streams, rivers, lakes, or ponds. Before purchasing plants, verify that the plant is not invasive.

Contact information for Aquatic Invasive Species personnel:
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

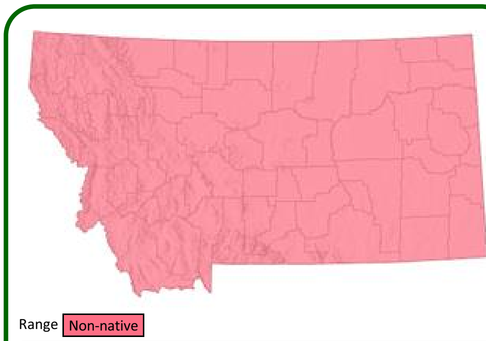
Montana Natural Heritage Program

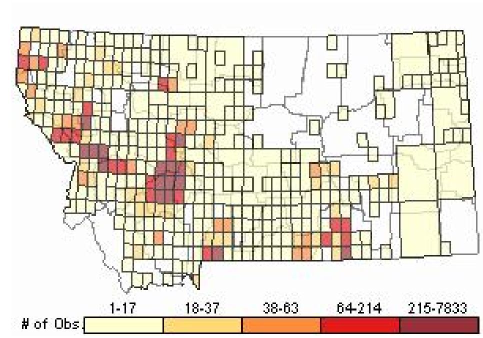
Dalmatian Toadflax
Linaria dalmatica

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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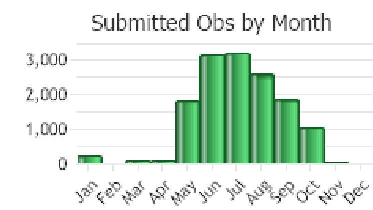


General Description

PLANTS: Short-lived perennial forbs that are rhizomatous from a caudex. Stems are erect, branched, and 40–80 cm tall. Plants are glabrous (no hairs), succulent, and waxy with a bluish to whitish cast. Sources: Lajeunesse *in* Sheley and Petroff 1999; Lesica et al. 2012.

LEAVES: Alternate on the stem. Blades are ovate, acute tipped, 2–5 cm long, sessile, and clasping around the stem.

INFLORESCENCE: A terminal bracteate raceme. Bright yellow flowers with orange centers and yellow spurs are snapdragon shaped and grow from the upper leaf nodes (leaf base).

Dalmatian Toadflax was named for the district of Dalmatia to where it is native in Eurasia (Alex 1959).

Phenology

Flowers develop in June through July with seed dispersal beginning in early July. Plant can continue to flower until winter arrives. Germination can occur in the fall, but primarily occurs the following April to May. Source: (Lajeunesse *in* Sheley and Petroff 1999).

Diagnostic Characteristics

Montana's two exotic Toadflax are both rhizomatous with similar snapdragon type flowers, but are easily separated by their leaves. Hybrids between the species can be produced in the lab, but are not known to occur under natural conditions (Lajeunesse *in* Sheley and Petroff 1999).

Linaria dalmatica leaves are ovate, less than 8 times as long as wide, and clasp around the stem.

Linaria vulgaris leaves are linear, more than 8 times as along as wide, and do not clasp the stem.

Narrow-leaf Dalmatian Toadflax or **Brown-leaved Toadflax** (*Linaria genistifolia* (L.) Mill.) is considered a subspecies of Broad-leaved Dalmatian Toadflax (*Linaria dalmatica (L.) Mill.*). Narrow-leaved Dalmatian Toadflax was separated based on smaller flowers (1.5-2 cm long), on average narrower leaves, 1.5-4.5 cm by 2-10(12) mm, and leaves that do not strongly clasp the stem.

Habitat

Fields, roadsides, grasslands, often in stony soil; plains, valleys (Lesica et al. 2012).

Management

Successful control requires the use of several management strategies because of the plants genetic variability. Seedlings and first-year rosette plants are vulnerable stages that managers should take advantage of to control Dalmatian Toadflax. Strategies to prevent young plants from producing flowers (hence seed production) will be effective to prevent spread or infestations. Once infestations are established, control will be labor-intensive, costly, and difficult.

PREVENTION [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
New infestations originate from seeds and vegetative buds on roots. Farm operations and equipment, vehicles, recreational activities, and other human actions can transport seeds. Check and clean all equipment before moving from an infested to an uninfested area. Use fill material that is weed-free, particularly in uninfested areas. When moving sheep or cattle from infested to uninfested areas, hold them in corrals/pastures for 11 or 6 days respectively, to allow time for viable seeds to pass through their digestive tracts. Monitor and control Toadflax in the holding areas. Purchase weed-free seed or hay.

CHEMICAL CONTROL [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Dalmatian Toadflax is difficult to control with herbicides due to its high genetic variability, waxy leaf surface, soil type, and biology. Herbicides must be applied using a surfactant because leaves have a waxy surface (cuticle) which acts as a protective barrier, hindering uptake. Herbicides are more likely to leach when applied to plants growing in sandy soils or soils low in organic matter, which could result in indirect negative impacts. Even where herbicides appear effective, long-term control may not be achieved and reinvasion from dormant seeds may occur. Where herbicides are effective, infestations should be treated every 3-4 years for at least 12 years in order to eradicate the plant. Through time sites may require higher rates of herbicide.

In studies Picloram ranges from not effective to effective and it depends upon the site. Fall applications appear more effective than spring applications. Fall applications should be timed with 1-3 inches of fall-regrowth which indicates plants roots are storing energy for the winter. Fall applications of 0.5 or 1.0 pound (lb) active ingredient per acre (ai/ac) for up to 2 or 3 years, respectively, have given up to 98% control on some sites. At the higher rate Picloram will kill many broadleaf plants, which may be desirable at the site. Under dry conditions, Picloram is not moved into the soil and can be reduced from exposure to the sunlight within 3-4 weeks.

In a study Dicamba applied prior to blooming at the rate of 4 lbs ai/ac provided excellent control for 1 year. In a study, Picloram (0.5 lb ai/ac) and 2,4-D (1 lb ai/ac) mixed in a tank and applied prior to blooming provided 90-100% control (see Sebastian and Beck 1989; Sebastian et al. 1990). In a study, a tank mixture of 2,4-D, Triclopyr, and 2,4-D Amine was ineffective when applied prior to blooming. Ferrell and Whitson (1989) found Triclopyr and Fluroxypyr to be ineffective whether used in combination or alone.

MECHANICAL and PHYSICAL CONTROL [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Hand-pulling can be effective for small infestations, particularly when soil is moist or where sandy. To delete the root reserves, pulling annually for 5-6 years and removing the lateral roots is necessary. To remove first-year seedlings, a site needs to be re-visited annually for 10-15 years.

Mowing is often not practical on most sites and is not very effective since a lot of growth occurs by rhizomes.

Cultivation: Sweep-type cultivators used from at least early June and repeated every 7-10 days can control Toadflax. To eradicate, 4-5 cultivations are required in the second year. However, inconsistent tillage can spread plants. Machinery should be thoroughly cleaned to prevent spreading root fragments.

Burning can remove standing biomass of Toadflax, but will also stimulate seed germination and root sprouting. Therefore, burning is not a recommended control method.

REVEGETATION [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Management practices, seeding, and plantings that encourage growth of desirable plants and those well-adapted to the environment will increase competition against Dalmatian Toadflax seedlings and rosettes. Revegetation or seeding should use several species that root at shallow, intermediate, and deep depths (least as deeply as Dalmatian Toadflax) in order to maximize competition for water, nutrients, and space. The mixture of species should provide active growth for as much of the year as possible, and include winter and summer annuals and shallow-rooted perennials. Desirable winter and summer annuals might compete well against Dalmatian Toadflax seedlings.

GRAZING MANAGEMENT [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Cattle usually avoid Dalmatian and Yellow Toadflax, though casual browsing has been observed along with reports of mild poisoning. Sheep can consume Dalmatian Toadflax as a major food source and not show signs of poisoning.

The timing of grazing is important in developing and maintaining competitive, desirable plant communities. Overgrazing sites encourages Dalmatian Toadflax germination and growth. This is particularly true in the spring because seedlings can capture available soil moisture and other resources better than overgrazed plants.

Preliminary results from several Montana studies indicated that sheep can suppress stands of Dalmatian Toadflax and limit seed production. The studies placed 1,000 ewes and lambs on a hilly rangeland where Dalmatian toad occupied 25-100% of existing plant coverage. Approximately 35-45% of the Toadflax foliage was stripped, and after three weeks they were regularly consuming plants, even when other forage plants were available. The sheep also maintained good weight gain.

When moving livestock from an infested to an uninfested area, hold cattle for 6 days and sheep for 11 days in corrals or small pastures until viable seeds have time to pass through their digestive tract. Monitor these areas for seedling establishment and provide control where seen. Avoid purchasing feed or seed that is contaminated by weeds.

BIOLOGICAL CONTROL [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
In general, it is recommended that at least 200 insects be established to create a sustainable population. Infestations should be at least 2 acres with sizeable populations. It may take 2-3 years for the insect population to establish.

As of 1998 6 insects have been approved and released in the U.S. and Canada for use on both Dalmatian and Yellow Toadflaxes. In Montana, *Brachypterolus pulicarius*, *Gymnaetron antirrhini*, *Mecinus janthinus*, and *Mecinus janthiniformus* are actively released for Dalmatian Toadflax. All have been effective, particularly *Mecinus janthinus* and *Mecinus janthiniformus*.

Toadflax Flower Beetle (*Brachypterolus pulicarius*) is thought to have been accidentally introduced, and now occurs throughout North America. Adult beetles feed primarily on growing shoot tips and axillary buds, but can also feed on pollen, anthers, and ovaries. Larvae feed entirely on pollen, anthers, ovaries, and immature seeds.

Toadflax Seedhead Weevils (*Gymnaetron antirrhini* and *Rhinusa neta*) are thought to be accidentally introduced to North America. *Gymnaetron antirrhini* is more widely distributed. They impact seeds by stimulating the development of a gall, and their larvae feed on both deformed and normal seeds. *Rhinusa neta* larvae also feed on seeds, but without the development of a gall.

The timing of maturity between Brachypterolus pulicarius and Rhinusa species can result in an interaction where B. pulicarius larvae predate upon the eggs of Rhinusa species.

Toadflax Brocade Moth *Calophasia lunula* larvae feed on the lower leaves and stems of Yellow Toadflax. Their feeding can exhibit significant mortality to seedlings and young plants. However, pathogens within this insect constrains it from building a large enough population that is needed to significant impact Yellow Toadflax.

Root-mining Cosmet Moth *Eteobalea intermediella* has showed great promise for controlling Yellow Toadflax in studies, but for unexplained reasons this insect has not established well in North America.

Toadflax Stem-boring Weevil *Mecinus janthinus* was originally collected from Yellow Toadflax in its native range. While this biocontrol insect has impacted Dalmatian Toadflax populations very well, it has not affected Yellow Toadflax in western North America, and researchers do not know why. Researchers are now evaluating *M. heydeni* for targeting Yellow Toadflax.

Dalmatian Toadflax Stem-boring Weevil *Mecinus janthiniformis* is effective.

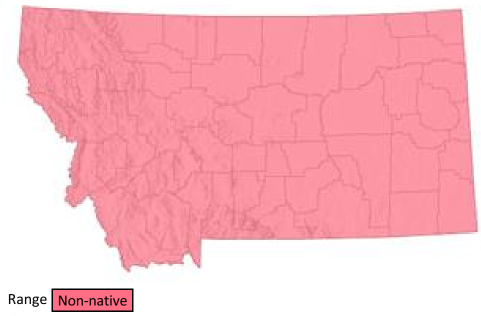
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

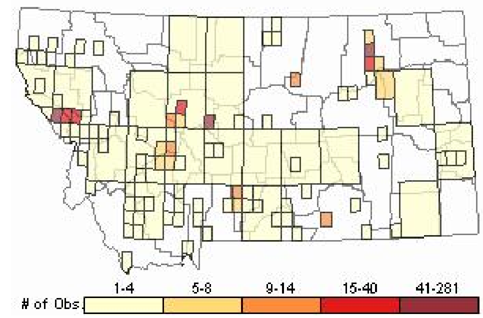
Diffuse Knapweed
Centaurea diffusa

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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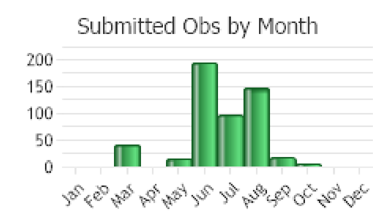


General Description

PLANTS: Taprooted, annuals or rarely short-lived perennials that grow in terrestrial habitats (Parkinson et al. 2011; Lesica et al. 2012). Stems are erect, branched, and grow about 20-100 cm tall (FNA 2006; Lesica et al. 2012). Plants are sparsely gray tomentose and resin-gland-dotted.

LEAVES: Leaves of the rosette (basal) and lower stem are long-petiolate, and often shrivel by maturity (FNA 2006; Lesica et al. 2012). Leaf blades are ovate, 3–12(20) cm long, and deeply pinnate (1 to 2 times divided) into linear-oblanceolate lobes. Leaves become sessile, smaller, and less dissected upwards.

INFLORESCENCE: Paniculate with several heads of whitish (sometimes purplish) flowers that occur on the ends of leafy branches (Lesica 2012; Sheley and Petroff 2009). Involucres are ovoid and 8–13 mm high. Involucral bracts (phyllaries) are pale green, ovate to lanceolate, and glabrous or finely tomentose. The margins of the bracts (appendages) are fringed with spines and end with a long, spreading spine of 1-5mm long (FNA 2006; Sheley and Petroff 2009).

Phenology

Flowering June to September, sometimes October.

Diagnostic Characteristics

The Montana Natural Heritage Botany Programs follows the *Centaurea* treatment by Keil and Ochsmann in FNA Volume 19 (2006). The Manual of Montana Vascular Plants (Lesica et al. 2012) treats this plant as *Centaurea maculosa* Lam.

For over 200 years there has been a lot of confusion in the European literature regarding the nomenclature used for *Centaurea stoebe* (FNA 2006). The names used in this group (*C. stoebe, C. rhenana, C. maculosa, C. biebersteinii*) have been applied to different taxa by different authors using different concepts. This was apparent between western and eastern Europe and was not taken into consideration in the treatment by J. Dostal (1976) (FNA 2006).

Recent studies have shown that the American plants are a tetraploid perennial that is very distinct from the diploid, biennial plants native to central Europe (FNA 2006). *Centaurea stoebe* ssp. *micranthos* being in America while plants in central Europe are known by the names of *C. stoebe* Linnaeus ssp. *stoebe*, *C. rhenana* Boreau, or *C. maculosa* Lamarck. In most American literature the name *Centaurea maculosa* Lamarck was misapplied to *C. stoebe* spp. *micranthos*. Others, such as W.A. Weber (1987, 1990) accepted the name of *Acosta maculosa* based on a treatment of about 100 plants in the *Centaurea* sect. *Acrolophus* Cassini (J. Holub et al. 1972). However, the genus *Acosta* is not supported by morphologic and molecular characteristics and is not widely accepted in Europe (FNA 2006).

Spotted Knapweed (*Centaurea stoebe* ssp. *micranthos*) has unique involucral bracts that have a dark colored tip and fringe that appear as “spots” from a distance.

Diffuse Knapweed (*Centaurea diffusa*) also grows a single, branched stem from a similar looking rosette. However, its growth develops a ball-shaped appearance and a tumbleweed mobility (Parkinson et al. 2011). Flowers are usually white or occasionally light purple. The flower bracts may have dark-colored tips but lack the dark fringe found in Spotted Knapweed. Bracts possess a rigid terminal spine (1/4 to 1/3 of an inch long) with 4-5 pairs of shorter, lateral spines (Parkinson et al. 2011).

Centaurea stoebe ssp. *micranthos* readily hybridizes with *Centaurea diffusa* (FNA 2006; Parkinson et al. 2011). These fertile hybrids have been named *Centaurea* x*psammogena* G. Gayer. Characteristics of the hybrids are variable, except for the cypselae (fruit) which always bears a pappus and the flower heads are always conspicuously radiant (composed of ray florets). Hybrids are often mis-identified as diffuse knapweed and may occur where their parent’s ranges overlap or are separate.

Habitat

Grasslands, roadsides, meadows, open forest, woodlands; plains, valleys, montane (Lesica et al. 2012).

Management

Successful management of diffuse knapweed requires that land-use objectives and a desired plant community be identified (Sheley and Petroff 1999). Once identified then an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of diffuse knapweed possible.

BIOCONTOL [Adapted from Sheley and Petroff 1999]
At least 200 insects are recommended for establishing a sustainable population. Infestations should be at least 2 acres with sizeable populations. It may take 2-3 years for the insect population to establish.

In the U.S. 12 flower seedhead and root-boring insect species are known to attach diffuse knapweed.
Knapweed Gall Flies (*Urophora affinis, U. quadrifasciata*) were released over 20 years ago in Montana and now are well-established in the western U.S. Flies have been shown to have high occupancy rates in the flower heads, yet a reduction in seed production was not apparent.
Knapweed Seed Head Weevils (*Larinus minutus, L. obtusus*) feed on foliage and flowers and are widely distributed and established.
Knapweed Root Boring Weevil (*Cyphocleonus aschates*) is well established. Larvae feed on taproots.
Sulphur Knapweed Moth (*Agapeta zoegana*) is established in parts of Montana. Larvae of these moths feed on the roots.
Bronze Knapweed Root Borer (*Sphenoptera jugoslavica*) is well established in parts of Montana. On hot, dry sites where there is competition with perennial plants, the larvae can weaken diffuse knapweed rosettes. It is presumed to be less damaging on cooler, moister sites because female beetles need five days of higher temperatures to lay eggs and larvae survival improves with dry conditions.

CHEMICAL CONTROL [Adapted from Sheley and Petroff 1999]
Herbicides are effective, especially when properly managed with other tactics. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Herbicides are more effective when applied to the rosette stage. Registered herbicides for Diffuse Knapweed include: Picloram (0.25-0.50 pound per acre), clopyralid (0.25-0.50 pounds per acre), Curtail® (2-5 quarts per acre), and 2,4,-D (1-2 pounds per acre).

CULTURAL and GRAZING CONTROLS [Adapted from Sheley and Petroff 1999]
Hand-pulling that extracts the full taproot is effective, particularly when soil is moist. In the rosette stage, taproots that are severed directly below the root crown have a higher rate of re-growth than when severed 2-4 inches below the crown. All plant material should be bagged, desiccated or burned, before placing in the trash for disposal. Gloves should be worn to protect skin.

Mowing is not very effective at reducing seed production. When mowed in the early flowering stage plants often re-grow and produce abundant late-season seeds.

Burning can damage plants, but is not effective at preventing growth, germination, or flowering.

Grazing. Diffuse knapweed is more likely to be grazed: a) by sheep than by cattle, b) when it is green and succulent (stages from rosette to flower bud), especially if adjacent vegetation is curing, and c) when it is the only available plant. Grazing should be timed to minimize damage during critical stages of growth for the desirable vegetation.

Revegetation that establishes a desirable perennial plant community will compete against diffuse knapweed for water, nutrients, and light. Proper revegetation of disturbed sites are necessary to reduce knapweed populations.

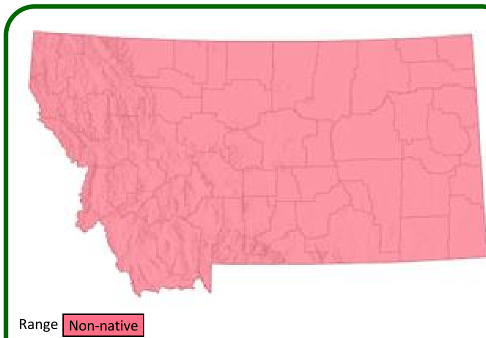
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

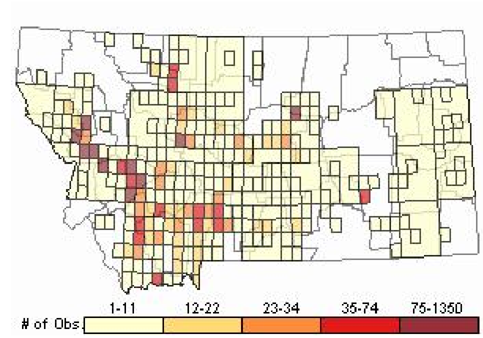
Whitetop
Lepidium draba

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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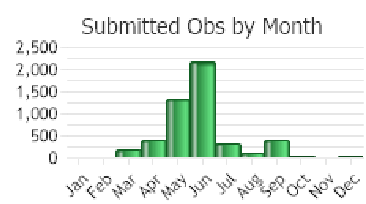

General Description

PLANTS: Perennial, rhizomatous forbs that grow 20 to 50 cm tall. Stems are single, branching above the ground and at their base grow either erect or decumbent. Sources: FNA 2010; Lesica et al. 2012

LEAVES: Basal leaves (rosette) are grayish-green and gradually narrow to a petiole that connects to the root crown. Basal leaves whither early. Stem leaves are alternately arranged, grayish-green, arrowhead-shaped, clasp the stem, and have entire to unevenly toothed margins. Leaf surfaces may be without hairs (glabrous) or with soft white hairs (pubescent). Sources: FNA 2010; Lesica et al. 2012

INFLORESCENCE: White flowers are arranged in flat-topped racemes (corymbose). As fruits mature the stem of the raceme may elongate, thus losing it's flat-topped appearance. Flowers have 4 white petals of 2.5-4.5 mm long, 4 greenish-white sepals of 1.5–2.5 mm long, stamens 6 (4 long and 2 short), and 1 pistil. Sources: FNA 2010; Lesica et al. 2012

Phenology

Flowering April to August (FNA 2010).

Diagnostic Characteristics

Botanists A. Thellung (1906), C.L. Hitchcock (1936), and C. Linnaeus correctly placed *Lepidium draba* into the genus *Lepidium*, which is now supported on phylogenetic and taxonomic grounds (FNA 2010). Further, *Lepidium appelianum, Lepidium chalepense*, and *Lepidium campestre* are also correctly placed (FNA 2010). However, the placement of these species into the genus *Cardaria* does not make sense from both phylogenetic and taxonomic grounds (FNA 2010).

There are many white-flowered species in the Mustard Family, both native and exotic. It is recommended that identifications be made using a plant manual designed for Montana. Mustards have flowers with 4 sepals, 4 petals, and 6 stamens (4 long and 2 short) among other characteristics.

Whitetop – *Lepidium draba*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous (lack hairs), flattened, and their base is cordate (heart-shaped or indented). Silicles are tipped with a style of 1-1.5 mm long. Silicle stems (pedicels) are 5-12 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

Globe-podded Whitetop – *Lepidium appelianum*, exotic:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.

* Silicles are pubescent (have hairs), inflated (globe-shaped), and with a short style of 0.4-1.0 mm long. Silicle stems (pedicels) are 4-11 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

Perennial Pepperweed – *Lepidium latifolium*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous or sparsely pilose (long soft hairs) with a very short style of 0.1 mm long or less. Silicle stems (pedicels) are 2-5 mm long.
* Stem leaves are sessile, but do not clasp around the stem.

Lenspod Whitetop – *Lepidium chalepense*, exotic:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* Silicles are glabrous (lack hairs), partially inflated and round (compressed-globose), not cordate (is pointed to its stem), and topped with a style 1-2 mm long. Silicle stems (pedicels) are 8-15 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

The other Montana ***Lepidium*** species (using MTNHP preferred name) have mature silicles with a notch of at least 0.1 mm deep at their top and are not rhizomatous.

Hoary False-alyssum – *Berteroa incana*, exotic and Noxious:
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are not notched at their tip.
* Each of the 4 petals are notched, making the flower appear 8-petaled.
* Plants have star-shaped hairs; whereas, *Lepidium* species have simple hairs or none.
* Stem leaves are widest near their tip (oblanceolate), sessile on the stem, and point upwards.

Field Pennycress – *Thlaspi arvense*, exotic:
* Easily differentiated if in fruit and easily confused with other species if only of leaves.
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are large, deeply notched at their tip, flat, and with wide wings, resembling a penny.
* Lower stem leaves have petioles. Upper stem leaves are sessile, clasping, auriculate (lobed like an arrow), and with smooth to toothed margins.

Common Yarrow – *Achillea millifolium*, native and desirable:
* Member of the Aster/Sunflower Family.
* Bright-white flowers arranged closely in a flat-topped inflorescence.
* Leaves are 2-3 times pinnately dissected, appearing fern-like or bushy like a squirrel's tail.

Sources: Jacobs and Mangold 2007; FNA 2010; Graves-Medley and Mangold 2011; Lesica et al. 2012.

Habitat

Whitetop is best adapted to moderately moist sites where annual precipitation ranges from 12-16 inches and to alkaline soils that can stay moist into late spring (Graves-Medley and Mangold 2011). In Montana Whitetop is most abundant in irrigated fields with saline soil and roadsides in the valleys (Lesica et al. 2012). Whitetop grows best in open, unshaded sites.

Management

Successful control requires integrating strategies to prevent new, eradicate or containing existing, and controlling large populations.

PREVENTION [Adapted from Graves-Medley and Mangold 2011]
Seed development must be prevented to reduce or stop spread. Spread can be reduced by:
* Preventing vehicles from driving through and animals from grazing within infested areas,
* Thoroughly washing the undercarriage of vehicles that have travel through infested areas,
* Encouraging landowners to frequently monitor their land for new infestations and, when found to implement effective control methods.
* Maintain proper livestock grazing management that is more resilient to Whitetop invasion, and
* Developing educational campaigns to teach people to not pick and transport the white flowers.

PHYSICAL and CULTURAL CONTROLS [Adapted from Graves-Medley and Mangold 2011]

Hand-pulling can provide control to small or new populations and around homesteads, gardens, and other urban areas. Plants must be pulled within 10 days of emerging and repeated (if re-emerged) throughout the growing season for another 2-4 years to ensure it is eliminated from the site. Plants grow fast and preventing them from seeding is key to controlling the population. Rhizomes must also be fully removed or they will re-sprout. Weeding is more successful if done when soil is moist.

Tilling must be done within 10 days of emergence and repeated throughout the growing season for 2-4 years to exhaust reserves in the rhizomes.

Revegetation that establishes a desirable perennial plant community will compete best against Whitetop. Crop plants that are competitive include alfalfa and legumes.

Flooding can control Whitetop, particularly where soil textures are heavy and hold onto water with little seepage and/or where continuous submersion from May through September could occur. Flooding is more appropriate for riparian areas and places that naturally exhibit intermittent or ephemeral flooding. Flooding may be inappropriate in many habitats and could damage native or other desirable plants.

CHEMICAL CONTROLS [Adapted from Jacobs and Mangold 2007]
Herbicides can control Whitetop, but require an aggressive re-application program and should be part of an integrated weed management plan. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

These herbicides have been used on rangeland, roadsides, and waste areas and applied to actively growing rosettes in the early spring, to re-growth before flower buds develop, or to fall re-growth before frosts kill plants. Herbides should be applied with adequate water (at least 10 gallons per acre) and with a nonionic surfactant at the label rate:
* Metsulfuron at the 0.5-1.0 ounce per acre rate,
* mixed Metsulfuron and Chlorsulfuron at the 2.0 ounce per acre rate, or
* Chlorsulfuron at the 0.5-1.0 ounce per acre rate.

2,4-D has been somewhat effective is applied before the flower-bud stage. at the rate of 2 quarts per acre will kill stems, but not the root crowns. Root crowns will re-sprout and require a different follow-up treatment.

GRAZING CONTROLS [Adapted from Jacobs and Mangold 2007]
Livestock should not graze infested areas during flowering and seed-set periods. Animals that have grazed in areas with Whitetop should be contained and fed weed-free forage for 10-14 days before moving into weed-free areas. This provides the necessary time for seeds to bedigested and excreted.

BIOLOGICAL CONTROLS
Several insects are being tested for use a biological control agent, but it is difficult since Whitetop is a member of the mustard family, which includes numerous important crops (cabbages, broccoli, mustard, canola, and others). Insects being investigated include a gall-forming weevil (*Ceutorhynchus cardariae*), a seed-feeding weevil (*Ceutorhynchus turbatus*), a root-mining weevil (*Melanobaris semistriata*), a shoot mining flea beetle (*Psylliodes wrasei*), and a gall mite (*Aceria drabae*).

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Montana State University Integrated Pest Management Extension
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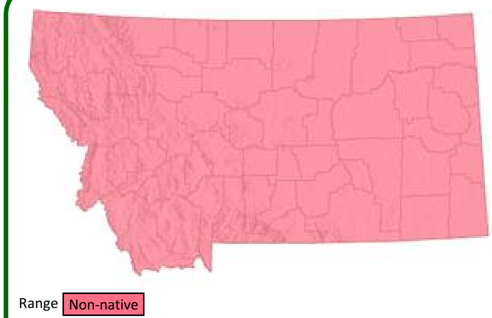
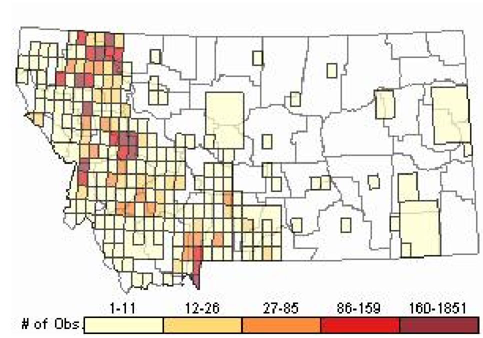
Yellow Toadflax
Linaria vulgaris

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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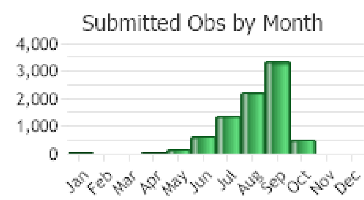

General Description

PLANTS: Taprooted perennial forbs that are somewhat woody at the base. Stems are clustered, erect, mostly simple (little branched), and 15–60 cm tall. Plants are most glabrous and pale green. Glandular hairs can be present in the upper stems/flowers. Sources: Lajeunesse *in* Sheley and Petroff 1999; Jacobs and Sing 2007; Lesica et al. 2012.

LEAVES: Alternate on the stem and numerous. Blades are narrow, linear-oblanceolate, and 1–5 cm long. Leaves are somewhat pointed on both ends.

INFLORESCENCE: A terminal bracteate raceme. Light yellow (butter-colored) flowers with orange centers and yellow spurs are snapdragon shaped and grow from the upper leaf nodes (leaf base).

The name "Toadflax" is in reference to its similarity to flax and is derived from "Tode Flax" or wild flax (Jacobs and Sing 2007). Carl Linnaeus derived the genus, *Linaria*, from *Linum*, the genus for Flax (Jacobs and Sing 2007). The specific epithet, *vulgaris* means "common"(Jacobs and Sing 2007).

Phenology

Flowering can begin in May and continues until October. Plants flowers along the upper stems while producing seed in the lower flowers. Source: (Lajeunesse *in* Sheley and Petroff 1999).

Diagnostic Characteristics

Montana's two exotic Toadflax species are both rhizomatous with similar snapdragon type flowers, but are easily separated by their leaves. Hybrids between the species can be produced in the lab, but are not known to occur under natural conditions (Lajeunesse *in* Sheley and Petroff 1999).

Linaria vulgaris leaves are linear, more than 8 times as along as wide, and do not clasp the stem.

Linaria dalmatica leaves are ovate, less than 8 times as long as wide, and clasp around the stem.

In the vegetative stage, **Leafy Spurge** (Euphorbia virgata) resembles Yellow Toadflax. The leaves of Leafy Spurge are glabrous, linear-oblanceolate in shape, 2-6 cm long, and with entire margins.

Habitat

Roadsides, dry fields, grainfields, waste areas, gravel pits, pastures and rangeland, clearings, clearcuts, vacant lots, and railroad yards. In the plains, valleys, montane, and subalpine habitats in Montana. Sources: Lajeunesse *in* Sheley and Petroff 1999; Lesica et al. 2012.

In Montana and Idaho, localized infestations can grow at high elevations (MTNHP Botanist personal communication). In the Big Sky area of Montana logging operations from the 1960's to 1980's created localized infestations, which have been spreading from residential development.

Management

Successful control requires the use of several management strategies because of the plants genetic variability. Strategies for Yellow Toadflax should focus on preventing vegetative spread more than on reducing seed production. Once infestations are established, control will be labor-intensive, costly, and difficult.

PREVENTION [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
New infestations originate from seeds and vegetative buds on roots. Farm operations and equipment, vehicles, recreational activities, and other human actions can transport seeds. Check and clean all equipment before moving from an infested to an uninfested area. Use fill material that is weed-free, particularly in uninfested areas. When moving sheep or cattle from infested to uninfested areas, hold them in corrals/pastures for 11 or 6 days respectively, to allow time for viable seeds to pass through their digestive tracts. Monitor and control Toadflax in the holding areas. Purchase weed-free seed or hay.

CHEMICAL CONTROL [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Yellow Toadflax is difficult to control with herbicides due to its high genetic variability, waxy leaf surface, soil type, and biology. Herbicides must be applied using a surfactant because leaves have a waxy surface (cuticle) which acts as a protective barrier, hindering uptake. Herbicides are more likely to leach when applied to plants growing in sandy soils or soils low in organic matter, which could result in indirect negative impacts. Even where herbicides appear effective, long-term control may not be achieved and reinvasion from dormant seeds may occur. Where herbicides are effective, infestations should be treated annually for 3 years (Jacobs and Sing 2007). Herbicides are more effective when applied in the spring before blooming (to reduce seed production), during flowering, and/or during fall re-growth (Jacobs and Sing 2007).

In a Colorado study, Picloram applied at 0.5 pounds per acre at the flowering stage at three different sites resulted in either 100, 69, or 35 percent control.

In a study Picloram (1.12 kg ai/ha) mixed with Fluroxypry (0.89 kg ai/ha) applied to just before blooming resulted in fair to good control.

Chlorsulfuron applied at 1.25 ounces per acre at flowering or in the fall found 84% control after one year.

Studies using 2,4-D, 2,4-DB, MCPA, or MCPB were ineffective. Spot treatments in low-till cropland using Glyphosate, Amitrole, diquat or Picloram have been used. Applying Glyphosate along with cultivation has been effective for reducing Yellow Toadflax for up to 2 years.

Additional study results can be found in the Natural Resources and Conservation Service pamphlet by Jacobs and Sing 2007.

MECHANICAL and PHYSICAL CONTROL [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Hand-pulling can be effective for small infestations, particularly when soil is moist or where sandy. To delete the root reserves, pulling annually for 5-6 years and removing the lateral roots is necessary. To remove first-year seedlings, a site needs to be re-visited annually for 10-15 years.

Mowing is often not practical on most sites and is not very effective since a lot of growth occurs by rhizomes.

Cultivation: Sweep-type cultivators used from at least early June and repeated every 7-10 days can control Toadflax. To eradicate, 4-5 cultivations are required in the second year. However, inconsistent tillage can spread plants. Machinery should be thoroughly cleaned to prevent spreading root fragments.

Burning can remove standing biomass of Toadflax, but will also stimulate seed germination and root sprouting. Therefore, burning is not a recommended control method.

REVEGETATION [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Management practices, seeding, and plantings that encourage growth of desirable plants and those well-adapted to the environment will increase competition against Yellow Toadflax seedlings and rosettes. Revegetation strategies can be effective since Yellow Toadflax seed production and viability are low. Revegetation or seeding

should use several species that root at shallow, intermediate, and deep depths (least as deeply as Yellow Toadflax) in order to maximize competition for water, nutrients, and space. The mixture of species should provide active growth for as much of the year as possible, and include winter and summer annuals and shallow-rooted perennials. Desirable winter and summer annuals might compete well against Yellow Toadflax seedlings.

For information on revegetation species and seeding rates refer to Montana Plant Materials Technical Note 46, “Seeding Rates and Recommended Cultivars" and Extension Bulletin EB19 “Dryland Pasture species for Montana and Wyoming".

GRAZING MANAGEMENT [Adapted from Lajeunesse *in* Sheley and Petroff 1999]
Cattle usually avoid Dalmatian and Yellow Toadflax, though casual browsing has been observed along with reports of mild poisoning. Sheep can consume Dalmatian Toadflax as a major food source and not show signs of poisoning.

The timing of grazing is important in developing and maintaining competitive, desirable plant communities. Overgrazing sites encourages Yellow Toadflax germination and growth. This is particularly true in the spring because seedlings can capture available soil moisture and other resources better than overgrazed plants.

When moving livestock from an infested to an uninfested area, hold cattle for 6 days and sheep for 11 days in corrals or small pastures until viable seeds have time to pass through their digestive tract. Monitor these areas for seedling establishment and provide control where seen. Avoid purchasing feed or seed that is contaminated by weeds.

BIOLOGICAL CONTROL [Sources Lajeunesse *in* Sheley and Petroff 1999; Jacobs and Sing 2007.]
In general, it is recommended that at least 200 insects be established to create a sustainable population. Infestations should be at least 2 acres with sizeable populations. It may take 2-3 years for the insect population to establish.

As of 1998 6 insects have been approved and released in the U.S. and Canada for use on both Dalmatian and Yellow Toadflaxes. In Montana, none of these bio-control insects have proved to be highly effective on killing Yellow Toadflax foliage, but have reduced its fitness.

Toadflax Flower Beetle (*Brachypterolus pulicarius*) is thought to have been accidentally introduced, and now occurs throughout North America. Adult beetles feed primarily on growing shoot tips and axillary buds, but can also feed on pollen, anthers, and ovaries. Larvae feed entirely on pollen, anthers, ovaries, and immature seeds.

Toadflax Seedhead Weevils (*Gymnaetron antirrhini* and *Rhinusa neta*) are thought to be accidentally introduced to North America. Rhinusa antirrhinin is more widely distributed. They impact seeds by stimulating the development of a gall, and their larvae feed on both deformed and normal seeds. R. neta larvae also feed on seeds, but without the development of a gall.

The timing of maturity between Brachypterolus pulicarius and Gymnaetron species can result in an interaction where B. pulicarius larvae predate upon the eggs of Gymnaetron species.

Toadflax Brocade Moth *Calophasia lunula* larvae feed on the lower leaves and stems of Yellow Toadflax. Their feeding can exhibit significant mortality to seedlings and young plants. However, pathogens within this insect constrains it from building a large enough population that is needed to significant impact Yellow Toadflax.

Root-mining Cosmet Moth *Eteobalea intermediella* has showed great promise for controlling Yellow Toadflax in studies, but for unexplained reasons this insect has not established well in North America.

Toadflax Stem-boring Weevil *Mecinus janthinus* was originally collected from Yellow Toadflax in its native range. While this biocontrol insect has impacted Dalmatian Toadflax populations very well, it has not affected Yellow Toadflax in western North America, and researchers do not know why. Researchers are now evaluating *M. heydeni* for targeting Yellow Toadflax.

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
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Spotted Knapweed
Centaurea stoebe

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
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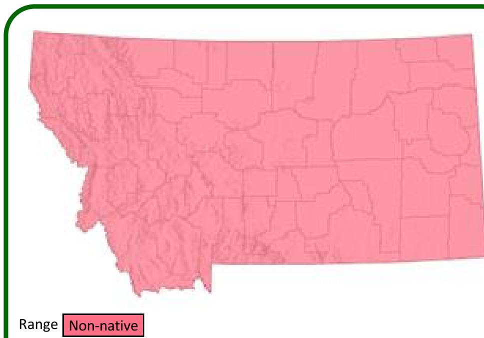
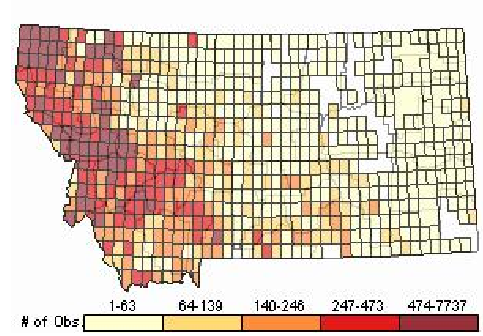
Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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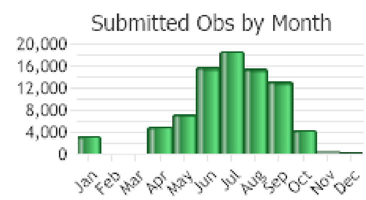


General Description

PLANTS: Taprooted, rosette-forming perennials that grow in terrestrial habitats (Parkinson et al. 2011). Stems are erect, branched, and grow up to 100 cm tall (Lesica 2012). Plants are sparsely gray tomentose and resin-gland-dotted (FNA 2006).

LEAVES: Leaves of the rosette (basal) and lower stem are long-petiolate (Lesica 2012). Leaf blades are ovate, 3–12 cm long, and deeply pinnate (1 to 2 times divided) into linear-oblanceolate lobes.

INFLORESCENCE: Corymbiform with several heads of purplish flowers that occur on the ends of leafy branches (Lesica 2012, Sheley and Petroff 2009). Involucres are ovoid and 8–13 mm high. Involucral bracts (phyllaries) are spine-tipped. Bracts are also marked with fine vertical streaks and tipped with a dark comb-like fringe (Parkinson et al. 2011). Inner bracts are lanceolate with swollen tips (Lesica 2012).

Plants in North America are subspecies *micranthos* (FNA 2006).

Phenology

Flowering June to September, or into October.

Diagnostic Characteristics

The Montana Natural Heritage Botany Program follows the *Centaurea* treatment by Keil and Ochsmann in FNA Volume 19 (2006). The Manual of Montana Vascular Plants (Lesica et al. 2012) treats this plant as *Centaurea maculosa* Lam.

For over 200 years there has been a lot of confusion in the European literature regarding the nomenclature used for *Centaurea stoebe* (FNA 2006). The names used in this group (*C. stoebe, C. rhenana, C. maculosa, C. biebersteinii*) have been applied to different taxa by different authors using different concepts. This was apparent between western and eastern Europe and was not taken into consideration in the treatment by J. Dostal (1976) (FNA 2006).

Recent studies have shown that the American plants are a tetraploid perennial that is very distinct from the diploid, biennial plants native to central Europe (FNA 2006). *Centaurea stoebe* ssp. *micranthos* being in America while plants in central Europe are known by the names of *C. stoebe* Linnaeus ssp. *stoebe*, *C. rhenana* Boreau, or *C. maculosa* Lamarck. In most American literature the name *Centaurea maculosa* Lamarck was misapplied to *C. stoebe* spp. *micranthos*. Others, such as W.A. Weber (1987, 1990) accepted the name of *Acosta maculosa* based on a treatment of about 100 plants in the *Centaurea* sect. *Acrolophus* Cassini (J. Holub et al. 1972). However, the genus *Acosta* is not supported by morphologic and molecular characteristics and is not widely accepted in Europe (FNA 2006).

Spotted Knapweed (*Centaurea stoebe* ssp. *micranthos*) has unique involucral bracts that have a dark colored tip and fringe that appear as “spots” from a distance.

Diffuse Knapweed (*Centaurea diffusa*) also grows a single, branched stem from a similar looking rosette. However, its growth develops a ball-shaped appearance and a tumbleweed mobility (Parkinson et al. 2011). Flowers are usually white or occasionally light purple. The flower bracts may have dark-colored tips but lack the dark fringe found in Spotted Knapweed. Bracts possess a rigid terminal spine (1/4 to 1/3 of an inch long) with 4-5 pairs of shorter, lateral spines (Parkinson et al. 2011).

Centaurea stoebe ssp. *micranthos* readily hybridizes with *Centaurea diffusa* (FNA 2006; Parkinson et al. 2011). These fertile hybrids have been named *Centaurea* x*psammogena* G. Gayer. Characteristics of the hybrids are variable, except for the cypselae (fruit) which always bears a pappus and the flower heads are always conspicuously radiant (composed of ray florets). Hybrids are often mis-identified as diffuse knapweed and may occur where their parent’s ranges overlap or are separate.

Russian Knapweed (*Acroptilon repens*) is rhizomatous, whereas, spotted knapweed is taprooted. The involucral bracts are green at the base with papery, translucent tips and are covered with light, thin hairs (Parkinson et al. 2011). The rosette leaves differ in being less dissected and wider (Parkinson et al. 2011).

Habitat

Grasslands, roadsides, meadows, open forest, and woodlands, particularly where land has been disturbed (Lesica et al. 2012; FNA 2006). Plains, valleys, and montane (Lesica et al. 2012).

Management

Successful management of spotted knapweed requires that land-use objectives and a desired plant community be identified (Sheley and Petroff 1999). Once identified then an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of spotted knapweed possible (Sheley and Petroff 1999).

PREVENTION [Adapted from Sheley and Petroff 1999]
Spotted knapweed is spread by wind and movement through established stands. Preventing vehicles from driving through and animals from grazing within infested areas will reduce spread. Hay that is weed-free will reduce spread. Maintaining an intact plant community and reducing soil disturbance will prevent or slow down spread.

BIOCONTROL [Adapted from Jacobs 2007]
At least 200 insects are recommended for establishing a sustainable population. Infestations should be at least 2 acres with sizeable populations. It may take 2-3 years for the insect population to establish. Spotted knapweed is best controlled when at least two insects (specializing in seed heads and roots) are used together. Bio-control insects have been shown in MT to reduce spotted knapweed populations, but control is most effective when used in combination with other tactics. Mouse populations have increased in some areas as Knapweed seed head bio-control species have become their new food source.

In the U.S. 8 flower seedhead and 5 root-boring insect species have been approved for release as bio-control on spotted knapweed.

Knapweed Gall Flies (*Urophora affinis, U. quadrifasciata*) were released over 20 years ago in Montana and now are well-established in the western U.S. They have been found to reduce seed production by 50%.
Knapweed Seed Head Weevils (*Larinus minutus, L. obtusus*) feed on foliage and flowers and are widely distributed and established.
Knapweed Root Boring Weevil (*Cyphocleonus aschates*) is well established and larvae feed on taproots.
Sulphur Knapweed Moth (*Agapeta zoegana*) is established in parts of Montana and prefer hot, dry, open sites where larvae attack roots.
Bronze Knapweed Root Borer (*Sphenoptera jugoslavica*) is well established in parts of Montana and prefer hot, dry, open sites where larvae attack roots.

CHEMICAL CONTROL [Adapted from Sheley and Petroff 1999; Jacobs 2007]
Herbicides are effective, especially when properly managed with other tactics. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and

impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Picloram used at 0.25 pound per acre is the standard recommendation and can reduce spotted knapweed populations by 90% on loamy soils with a well-maintained grassland community. It cannot be used in sandy soils, near surface waters, or in areas with a high-water table.
2,4-D is a broadleaf-selective herbicide that works best when used after seeds germinate and before plants develop flowers.
Clopyralid or triclopyr herbicides do not injure non-target forbs.
Aminopyralid is a more recently developed chemical that has a lower application rate and a shorter soil half-life.

PHYSICAL and CULTURAL CONTROLS [Adapted from Sheley and Petroff 1999; Jacobs 2007]
Hand-pulling that extracts the full taproot is effective, particularly when soil is moist. All plant material should be bagged and desiccated before placing in the trash for disposal. Gloves should be worn to protect skin.

Mowing after plants bolt and before flowering will reduce energy reserves and seed production. Repeated mowing may be necessary. Mowed plants will develop flower heads below the mower blade's height.

Tilling that severs the taproot near, but below the root crown can reduce populations. However, seed germination may increase until the seed bank is gone.

Burning is not effective, and may stimulate growth or germination.

Revegetation that establishes a desirable perennial plant community will compete against Spotted Knapweed for water, nutrients, and light. Proper revegetation of disturbed sites are necessary to reduce knapweed populations.

GRAZING CONTROLS [Adapted from Sheley and Petroff 1999; Jacobs 2007]
Plants can tolerate defoliation, but severe defoliation will reduce root, crown, and above ground growth. Grazing by cattle is not as effective as by sheep or goat. Cattle prefer grasses over spotted knapweed. Sheep and goats will eat more knapweed, especially when combined with other management tactics. Grazing an area first by cattle and later by sheep, increasing grazing pressures by using electrical fences, or irrigating land followed by repeated sheep grazing are some useful tactics to reduce knapweed. Animals grazing on knapweed should be held for at least 5 days before moving to weed-free areas.

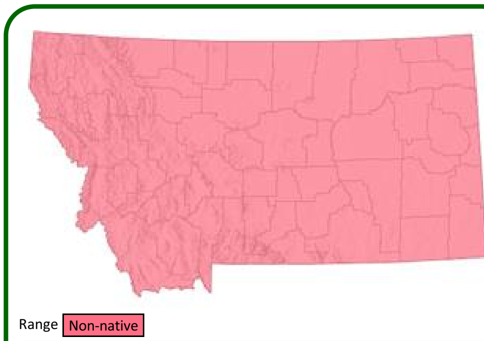
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

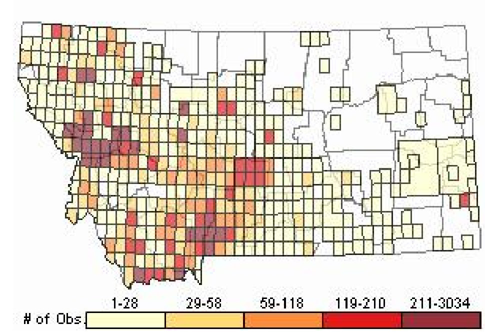
Common Hound's-tongue
Cynoglossum officinale

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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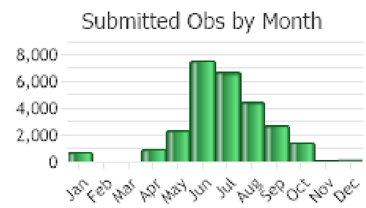

General Description

PLANTS: Taprooted, biennial or short-lived perennial forbs that are densely hairy (villous) and have erect stems of 30–100 cm tall. Source: Lesica et al. 2012

LEAVES: Basal leaves are grey-green to dull green, petiolate, large, 7-25 cm long and 2-5 cm wide, and covered with dense soft hairs (villous). Blades are simple, have smooth (entire) margins, and oblanceolate to lanceolate in shape. Stem leaves are petiolate but become sessile upwards. Source: Jacobs and Sing 2007; Lesica et al. 2012

INFLORESCENCE: Flowers arranged in racemes that grow from the axils of branches and tips of stems. Pedicels are short and spreading to reflexed at maturity. Dark, reddish-purple (occasionally white) flowers are composed 5 triangular-lobed sepals that are fused to form a star-shaped calyx, and 5 petals that are fused to form a funnel-shaped corolla. Flowers are 4–5 mm long and 6–9 mm across. In fruit sepals are oblong, 5–7 mm long. The 5 stamens alternate with the fornices. The pistil has a deeply lobed ovary and a single, short, and entire style. Nutlets are ovoid, 4–7 mm long, with barbed prickles that spread at maturity. Source: Jacobs and Sing 2007; Lesica et al. 2012

The Greek words *Kynos* and *glossa* meaning ‘dog’ and ‘tongue’ combine to form *Cynoglossum* (Jacobs and Sing 2007). It refers to the shape and texture of the basal leaves.

Diagnostic Characteristics

Common Hound’s-tongue is characterized as a robust plant, with large hairy basal leaves, thick stems that terminate into racemes of burgundy-red flowers that each produce 4-prickly nutlets that catch your clothing like VELCRO. Occasionally flowers are white (see photo). Montana has no other *Cynoglossum* species.

In winter as the snow accumulates Common Hound’s-tongue plants are easy to identify from a distance. Plants remain upright and retain some of the 4-prickly nutlets.

Possible look-alikes can be found in the Family Boraginaceae where many species have prickly or sticky seeds that catch your clothing. Check out members of *Lappula* (Stickseed) or *Hackelia* (Stickseed). Species may differ in not being stout or robust plants, having flowers with different morphology, having blue flowers, having nutlets that are smaller or differently-shaped, and/or other characteristics.

Habitat

Hound's-tongue is found in disturbed ground of pastures, fields, roadsides, grasslands, meadows, woodlands, riparian thickets in Montana (Lesica et al. 2012). It occurs in the plains and valleys of Montana (Lesica et al. 2012).

In England, plants occur on sandy soils and old dune-grasslands (Jacobs and Sing 2007). In the Netherlands it has been reported from calcareous coastal dunes (Jacobs and Sing 2007).

Management

Common Hound's-tongue establishes, grows, and expands it populations where land is disturbed (Jacobs and Sing 2007). Plants are characterized as having a relatively low growth rate and weak ability to compete (Jacobs and Sing 2007). Thus, rapid restoration, reclamation, and/or revegetation of disturbed sites will prevent or reduce its establishment. Early detection and prevention of seed production are critical to avoiding problematic infestations (Jacobs and Sing 2007).

Management should target the flowering stages to get control on the population (Jacob and Sing 2007). An integrated vegetative management approach provides the best long-term control; it requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed. An integrated weed management strategy promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of Common Hound's-tongue possible.

PREVENTION [Adapted from Jacobs and Sing 2007]
Successful management seeks to control flowering to prevent seed formation and dispersal. Once established large infestations are difficult to control.

MECHANICAL and PHYSICAL CONTROL [Adapted from Jacobs and Sing 2007]
Hand-pulling can be effective, especially for small infestations. It is best to pull plants before they produce seeds. Plants should be bagged and deposited in the landfill. Pulling plants with seeds (in fruit) easily distributes them. Therefore, Plants with seeds should be bagged and burned, or bagged and allowed to desiccate or rot before disposing in the landfill. The general rule, regardless of species, is to wear gloves when weeding. It is wise to protect one's-self against the prickly seeds and high levels of pyrrolizidine alkaloids by wearing gloves. Soil should be moist so that the entire taproot can be extracted. Roots left in the soil can re-sprout. Using a shovel might make pulling more effective because roots tend to break at the root crown.

Mowing will cut stems and reduce or prevent flowering/seeding, but will not remove plants (rosettes).

Prescribed Burning in late summer and early fall may reduce the spread of Common Hound's-tongue because it can damage or kill plants and seeds. However, the disturbance can maintain good conditions (bare soil, low plant competition, and open canopy) for Common Hound's-tongue to re-establish. Fire can promote seed germination form the seedbank and taproots to re-grow. A revegetation plan that encourages competitive, desirable plants should be implemented as soon as is appropriate after the prescribed burn.

Where plants have invaded cropland, a single, shallow tilling can kill rosettes and root crowns.

Revegetating disturbed sites will prevent or greatly reduce establishment by Common Hound's-tongue and many other exotic plants. Sustainable suppression requires revegetating with desirable plants that compete well for light, water, and nutrients. Desirable vegetation should be appropriate for the management objectives, adapted to the site conditions, and be competitive. Planting with appropriate native plants is highly encouraged. Refer to Montana Plant Materials Technical Note 46, *Seeding Rates for Conservation Species for Montana*, and Extension Bulletin EB0019, *Dryland Pasture Species for Montana and Wyoming* for possible species selection and seeding rates.

Revegetating land should be used, appropriately, in combination with herbicide treatment, grazing management, prescribed burning, hand-pulling and other control methods.

CHEMICAL CONTROLS [Adapted from Jacobs and Sing 2007]
Dicamba (but not picloram) and 2,4-D are auxin-type herbicides that can kill first-year rosettes. They are less effective on plants that have bolted. It is necessary to use a nonionic surfactant because the hairy leaves impedes penetration by the herbicide.

Chlorsulfuron, metsulfuron and trisulfuron are effective at killing Common Hound's-tongue plants at all growth stages. Metsulfuron (0.5 ounce per acre rate) applied at the first sign of flowering will kill plants and prevent seed production. It is necessary to use a nonionic surfactant because the hairy leaves impedes penetration by the herbicide.

Imazapic (8-12 ounces per acre) should be applied with 1 quart of methylated seed oil to rosettes or bolting plants.

Although Common Hound's-tongue is normally ignored by livestock, herbicide treatment could make plants more palatable. Therefore, grazing by domesticated animals should be suspended for 2 weeks after herbicide treatment to avoid potential poisoning.

GRAZING CONTROLS [Adapted from Jacobs and Sing 2007]
Livestock, sheep, and goats are not practical to use for controlling Common Hound's-tongue. Plants are toxic and the risk of poisoning is possible.
Using grazing management techniques to maintain healthy, viable plant communities will resist Common Hound's-tongue invasion.

BIOLOGICAL CONTROL [Adapted from Jacobs and Sing 2007]
Since 1988 five biological control insects have been identified for controlling Common Hound's-tongue:
* Root-mining Hoverfly - *Cheilosia pascuorum*,
* Hound's-tongue Seed-feeding Weevil - *Mogulones borraginis*,
* Hound's-tongue Stem-feeding Weevil - *Mogulones trisignatus*,
* Root-mining Flea Beetle - *Longitarsus quadriguttatus*, and
* Hound's-tongue Root Mining Weevil - *Mogulones cruciger*.

The Root-mining Flea Beetle and Hound's-tongue Root Mining Weevil were released in British Columbia, Canada from 1997 to 1998. The Hound's-tongue Root Mining Weevil has established better and is now distributed in Alberta. They have been significantly effective in reducing Common Hound's-tongue.

In the U.S. release of bio-control has not been approved. This is primarily because test results also showed that insects damaged two native plants, Stickseed (*Hackelia floribunda*) and Miner's Candle (*Cryptantha elosioides*). There are also concerns that bio-control insects could hurt *Cryptantha crassipes*, a federally-listed endangered plant (not in Montana).

Useful Links:
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Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
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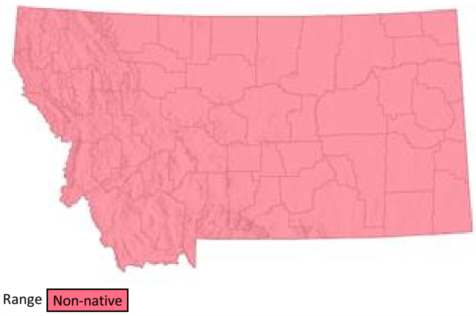
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

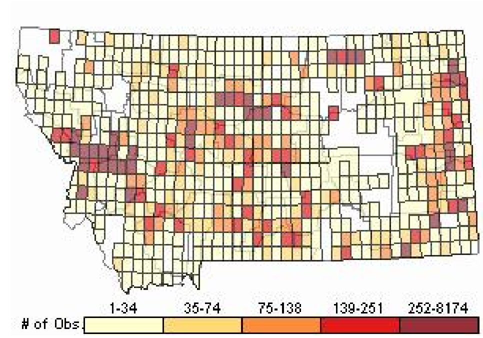
Leafy Spurge
Euphorbia virgata

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNRTNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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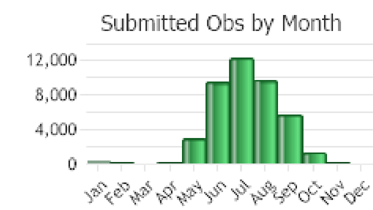


General Description

PLANTS: Glabrous, perennial forb with spreading roots and branched stems that are 30–80 cm tall. Plants produce vegetative and flowering stems that when cut exude a white, milky latex. Stems are pale green to blue-green. Sources: Jacobs 2007; Lesica et al. 2012

LEAVES: Stem leaves are alternately arranged and sessile or with very short petioles. Leaf blades are green to blue-green, linear-oblanceolate in shape, 2–6 cm long, and have entire (smooth) margins. When cut leaves cut exude a white, milky latex. Sources: Jacobs 2007; Lesica et al. 2012

INFLORESCENCE: A terminal umbel of yellow-green, ovate bracts containing inconspicuous flowers that lack petals and sepals. The bracts are 8-16 mm long. Above the bracts, the true flowers are green and occur within a cup-like involucre called a cyathium (plural is cyathia). Each cyathium contains one seed (female) flower, 3 (male) pollen flowers, are 2–3 mm long, and have 4 yellowish glands with a lunate appendage. Fruits are a capsule, about 4 mm long, lobed and nearly smooth. Sources: Jacobs 2007; Lesica et al. 2012

Phenology

Flowering and fruiting spring through fall (FNA 2016).

Diagnostic Characteristics

Leafy Spurge is part of a taxonomically complex group of species native to Europe and Asia (Berry et al. *in* Flora of North America (FNA) 2016).

The true ***Euphorbia esula*** Linnaeus is restricted to certain parts of Europe where it shows little tendency to weediness (Berry et al. *in* FNA 2016). It is distinguished from *Euphorbia virgata* by leaf shape: oblanceolate to obovate-elliptic, margins not parallel at the middle and wider near their apex, 3-8(-10) times longer than wide, a round to subacute apex, and a base that is gradually attenuate to cuneate. Herbarium specimens of *Euphorbia esula* indicate it was present in North America, but apparently has not persisted, and is assumed absent (Berry et al. *in* FNA 2016).

Euphorbia virgata **retains the common name Leafy Spurge**.
It is widespread in Europe and temperate Asia where it shows a weedy characteristic (Berry et al. *in* FNA 2016). It is distinguished by:
* Leaf blades are linear, linear-oblanceolate, or linear-oblong, 6-15 times longer than wide, margins are (almost) parallel at the middle, leaf apex is acute, and leaf base is truncate to abruptly attenuate.

* Stems are blue-green to pale green.

Yellow Toadflax - *Linaria vulgaris*, exotic and Noxious.
* Non-flowering plants are similar. Leaves are glabrous, long and narrow.
* Flowers are snapdragon-like, yellow, and lack leafy bracts.

Habitat

Grasslands, meadows, woodlands, and riparian forests in the plains and valleys of Montana (Lesica et al. 2012).

Management

An integrated vegetative management approach provides the best long-term control for Leafy Spurge. It requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified the integrated weed management strategy can promote a weed-resistant plant community that serves other land-use objectives such as livestock forage, wildlife habitat, or recreation (Shelly et al. *in* Sheley and Petroff1999).

PREVENTION [Adapted from Lajeunesse et al. *in* Sheley and Petroff 1999]
Preventing the establishment of Leafy Spurge can be accomplished by many practices:
* Learn how to accurately identify Leafy Spurge in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Use certified weed-free seeds and hay, including feed for pack animals.
* Before moving animals from infested areas, hold cattle for 6 days and sheep for 11 days in corrals or pastures to allow seed to pass through the digestive tract before moving to uninfested areas. Monitor and treat the holding area for emerging Leafy Spurge.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Leafy Spurge populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Lajeunesse et al. *in* Sheley and Petroff 1999]

Hand-pulling can be done for small infestations. However, it is considered ineffective because of the deep depth of the root system and its numerous buds.

Mowing may remove flowering stems, but is ineffective for controlling Leafy Spurge because it re-sprouts from buds on the spreading roots.

Tilling can be effective if done intensively throughout the growing season or only during fall. The intensive program would begin in the spring, use a duckfoot cultivator that tills 4 inches deep, and repeats the tilling every 3 weeks until the soil freezes for 1 to 2 growing season. The schedule must not be interrupted because fragmented rootstock will quickly re-sprout. Machinery must be thoroughly cleaned to prevent contaminated the field and other areas. Fall-only cultivation would occur in the autumn when Leafy Spurge is 3-6 inches tall, cultivate 1-2 times after harvest, and for 3 years. Fall-only cultivation allows crops to grow, limits organic matter degradation, and reduces soil erosion. Combining the Fall-only cultivation with other methods could provide better control.

Prescribed burning by itself is ineffective for controlling Leafy Spurge because fire stimulates seed germination and re-sprouting of the buds on the root crown and spreading roots. However, herbicide absorption might be improved when integrated with a burning plan. Burning removes all of the above-ground biomass and provides a uniform surface for re-growth to be seen and for the herbicide to be applied uniformly. After burning about 5 weeks of re-growth should occur before the herbicide is applied. The combination does not control Leafy Spurge any better, but provides a better surface for herbicides to be applied and absorbed into the plant.

BIOLOGICAL CONTROLS [Adapted from Jacobs 2007]
14 insects have been approved for introduction into the U.S. as biological control for leafy spurge by the U.S. Department of Agriculture.

Of all the biocontrol insects for Leafy Spurge *Aphthona* Flea Beetles are widespread and have reduced Leafy Spurge the most in Montana. The exception is Minute Spurge Flea Beetle (*Aphthona abdominalis*) which is

reported as not established in Montana and not available in the U.S. The Leafy Spurge Flea Beetles are capable of surviving cold, sub-freezing winter temperatures. Larvae of *Aphthona* Flea Beetles develop in the soil, and cool soil temperatures can delay development and establishment. Herbicide applications, grazing, or mowing that reduces the density of Leafy Spurge has been observed to improve flea beetle establishment. Ants are predators on these insects and releases should not occur where there are ant mounds.
Some bio-control companies sell or provide mixed releases to boost success since release sites vary in soil type, canopy cover, and moisture.

* Brown Dot Leafy Spurge Flea Beetle (*Aphthona cyparissiae*): Best where soils are 40 to 60 % sand and Leafy Spurge stems are taller than 21 inches and 50-121 stems per square yard based on research in Canada. Green Needle Grass (*Stipa viridula*) is an indicator of suitable habitat in Canada.

* Black Leafy Spurge Flea Beetle (*Aphthona czwalinae*): It not does establish well in clay or acidic soils or in deeply shaded areas.

* Copper Leafy Spurge Flea Beetle (*Aphthona flava*)

* Brown-legged Leafy Spurge Flea Beetle (*Aphthona lacertosa*): Best where sites are open, sunny, mesic to moderately dry, but can do well on wet sites too.

* Black Dot Leafy Spurge Flea Beetle (*Aphthona nigriscutis*): Best suited for dry sites with full solar exposure, well-drained soils with less than 3% organic matter, and Leafy Spurge plants of less than 30 inches tall and fewer than 60 stems per square yard (Jacobs 2007). It has been found to feed on the native Euphorbia brachycera, which is a plant that occurs in Montana.

Clearwing Moth (*Chamaesphecia crassicornis*): Moth where larvae attack roots and stems.

Hungarian Clearwing Moth (*Chamaesphecia hungarica*): Moth where larvae attack roots.

Spurge Hawkmoth (*Hyles euphorbiae*): Best where Leafy Spurge plants are dense within open areas near trees. Larvae consume leaves and can kill the plants. Larvae pass through five growth stages before becoming adults. Larvae have toxins that deter predators; however, their pupae are eaten by birds, ground squirrels, and other small mammals.

Red-headed Leafy Spurge Stem Borer (*Oberea erythrocephala*): It seems to establish best in riparian areas and mesic sites with trees. When adults lay eggs they girdle and often kill Leafy Spurge stems. Larvae will kill stems when feeding, which reduces the plant's ability to store energy or produce seeds. They are compatible with Apthona Flea Beetles, causing greater negative impacts to Leafy Spurge.

Leafy Spurge Tip Gall Midges (*Spurgia esulae*): Best where sites are have cooler areas (partially shaded) with dense Leafy Spurge. The insect forms a gall at the tip of the stem. From the gall larvae attack the growing shoot tips, which prevents flowering but stimulates branching and shoot re-growth. The insect can produce up to three generations each summer which attack the new shoots.

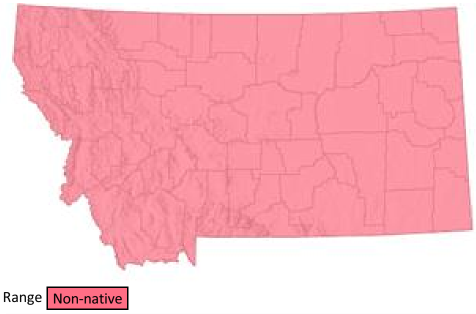
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

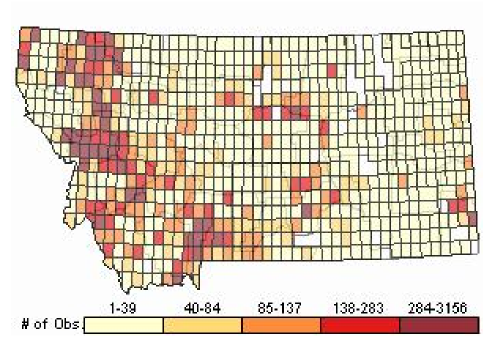
Canada Thistle
Cirsium arvense

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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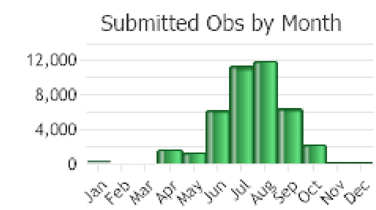


General Description

PLANTS: Strongly rhizomatous, perennial forbs. Stems are erect, often branched above, and 30–100 cm. Stems have sparse hairs (glabrate). Individual stems are unisexual. Source: Lesica et al. 2012

LEAVES: Basal leaves have regularly spaced, coarse, marginal hairs, and shallowly lobed. Stem leaves are alternately arranged with short petioles. Leaf blades are oblanceolate to elliptic, usually with crinkled edges and spiny-toothed margins, very irregularly lobed, 3-15 cm long, and terminate in a spine. Leaves are sometimes tomentose beneath. Upper leaves become small and decurrent. The lowest leaves usually become deciduous. Sources: Morishita *in* Sheley and Petroff 1999; Lesica et al. 2012.

INFLORESCENCE: Purple flower heads are arranged as several per stem in a corymbiform array with peduncles (stalks) of 0–4 cm long. Involucres are 1–2 cm high. Involucral bracts are imbricate in 6 to 8 rows. The outer bracts are ovate with a darkened resinous keel-tip. The inner bracts are linear, Bracts either have short or absent spines. Source: Lesica et al. 2012

Diagnostic Characteristics

On first-glance thistles can look similar, but upon closer inspection differences become apparent. Thistles belong to the genera of *Cirsium*, *Carduus*, and *Onopordum*. They are separated by:

Cirsium
* Feathery (plumose) pappus, which have fine, long hairs on each side of the main bristle.
* Receptacle of flower head has bristles. Look between florets within a flower head to find them.

Carduus
* Capillary pappus, which are minutely barbed, narrow bristles.
* Receptacle of flower head has bristles. Look between florets within a flower head to find them.

Onopordum
* Receptacle of flower head has no bristles. Look between florets within a flower head to find nothing.
* Entire lengths of stems have spiny wings.
* Foliage is silvery gray.

Native versus Exotic (Source: Parkinson and Mangold 2015)
* Native thistles tend to have involucral bracts adhere to the flower head for most of their length (except for the spine).

* Native thistles tend to grow scattered across a habitat, spreading slowly with disturbance, and contribute to plant diversity.
* Exotic thistles grow quickly with disturbance, form dense patches that interfere with access, and through competition often reduces plant diversity.

Montana has 12 species of *Cirsium*, and only 5 are described below.

Canada Thistle - *Cirsium arvense*, exotic and Noxious
* Flower heads have involucres less than 2 cm tall [examine larger heads].
* Each flower head consists of either male florets or female florets.
* Leaves are arachnoid-villous, but the green leaf remains visible.
* Stems lack an obvious winged stem.
* Plants are strongly rhizomatous.

Bull Thistle – *Cirsium vulgare*, exotic and undesirable
* Flower heads are mostly single at stem tips and arranged in an open inflorescence.
* Flower heads have involucres more than 2 cm tall [examine larger heads].
* On the flower head the outer bracts tend to point outwards and upwards, are needle-like and long.
* Leaves are deeply lobed, green beneath with cobwebby hairs and obvious white veins.
* Leaves have many sharp, short spines. Entire plant has spines, some very long, making it difficult to touch without injury.
* Plants are taprooted.

Wavyleaf Thistle - *Cirsium undulatum*, native and desirable
* Upper leaf surface lacks spines AND white-tomentose hairs making it appear gray.
* Involucral bracts tend to point upwards with inner bracts acuminate.
* Flower heads have involucres more than 2 cm tall [examine larger heads].
* Most flower heads not clustered and peduncles more than 2 cm long.

Flodman's Thistle - *Cirsium flodmanii*, native and desirable
* Upper leaf surface lacks spines AND has sparse white-tomentose hairs making it appear green.
* Involucral bracts tend to point upwards with inner bracts acuminate.
* Flower heads have involucres more than 2 cm tall [examine larger heads].
* Most flower heads are not clustered and some peduncles are more than 2 cm long.

Long-styled Thistle - *Cirsium longistylum*, native, Montana endemic, and SOC
* Upper leaf surface lacks spines.
* Inner and outer bracts are wide, scarious, and with erose tips AND outer bracts have a raised, darkened, and resinous keel.
* Flower heads have involucres more than 2 cm tall [examine larger heads].

Scotch Thistle – *Onopordum acanthium*, exotic and undesirable
* Receptacle of flower head has no bristles.
* Entire lengths of stems have spiny wings, becoming broad and spiny.
* Foliage is silvery gray and can grow taller than 6 feet.

Musk Thistle - *Carduus nutans*, exotic and undesirable
* Flower heads have involucral bracts that are broadly triangular, have smooth margins, and a short spine-tip.
* Heads nod as flowers mature.

Habitat

In Montana it occurs in moist, usually disturbed soil of fields, meadows, thickets, roadsides, woodlands, open forests, often along streams, wetlands in the plains, valleys, and montane zones (Lesica et al. 2012).

It frequently occurs along roadsides, railroad rights-of-way, rangeland, forest land, lawns, gardens, cropland, abandoned fields, stream banks, lake shores, and other riparian habitats (Morishita *in* Sheley and Petroff 1999). It infrequently occurs in sand dunes and open sandy areas (Morishita *in* Sheley and Petroff 1999). It has been observed that the diversity of annual broadleaf species increases near patches of Canada thistle (Morishita *in* Sheley and Petroff 1999).

Canada Thistle grows best where temperatures range from 32 to 90 degrees Fahrenheit and precipitation levels range from 16 to 30 inches per year (Moore 1975). It colonizes clay soils very well, is adaptable to many other soil types, and is most productive in well-aerated soils (Morishita *in* Sheley and Petroff 1999). It tends to survive dry conditions better than wet conditions (Morishita *in* Sheley and Petroff 1999).

Management

Persistent control over many years is required to eliminate Canada Thistle because of its extensive root system. Combining cultural, mechanical, biological, and chemical techniques will best exhaust the nutrients in its root system (but must be designed to the site's specific conditions). An integrated vegetative management approach provides the best long-term control and requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed that can promote a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation.

PREVENTION [Adapted from Jacobs et al. 2007]
Preventing the establishment of Canada Thistle can be accomplished by many practices:
* Learn how to accurately identify Canada Thistle in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Canada Thistle populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs et al. 2007]
Hand-pulling is effective for young populations if done several times each season to starve the root-system. Hand-pulling plants in combination with other control methods will likely be more successful at removing the population.

Tilling fragments the rhizomes allowing Canada thistle to increase in abundance. Suppression might occur where tilled at 21-day intervals throughout the growing season followed by establishing perennial forage plants or winter annual cereals; these plants emerge in early spring and can inhibit the emergence of late Canada Thistle shoots.

Prescribed Burning that is done in early spring can encourage growth (sprouting and reproduction). Prescribed burning in late spring (May to June) may help control Canada Thistleganic matter and deletes nutrients, creating conditions that favor its re-establishment.

Mowing can be effective when done 3 or more times during the growing season for several consecutive years. Mowing in combination with using herbicides such as piclorum, piclorum + 2,4-D, or Dicamba can be more effective. In Canada mowing Canada Thistle 3 or 4 times each year almost eliminated it after 3 years, but at other sites only worked to prevent flowering.

CHEMICAL CONTROLS [Adapted from Jacobs et al. 2007]
Herbicides can be effective, especially when properly integrated with intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Effective control of Canada Thistle requires that an appropriate toxic level of the active ingredient be put into the root system. This means applying the appropriate herbicide on enough leaf area at a time when the plant translocates it to the root system is necessary. Avoid mixing a fast-acting herbicide with a systemic herbicide because the foliage will die before the plant can move the active ingredient into the root system.

Herbicides can be applied in the bud stage or in fall re-growth. In the bud stage leaf area is maximized and root reserves are depleted. In the fall, translocation to the root system will be at its greatest. Canada Thistle plants convert starch into sugar in their roots. A study has found that a fall herbicide treatment can prevent the conversion of starch into sugars in the roots. The sugars act as an anti-freeze by preventing ice-crystals from forming within root cells. Without sugars, roots are susceptible to winter kill. Applying the herbicide onto the correct plant is important, because roots of crops (especially legumes) can also be damaged.

Aminopyralid, clopyralid, and Picloram provide similar suppression in pastures and rangelands when applied at label rates and at times when the plant can get it into the root system. Picloram is a restrict-use herbicide because it is persistent, yet mobile in the soil, and can contaminate water.

BIOLOGICAL CONTROLS [Adapted from Jacobs et al. 2007]
Canada Thistle Stem Weevil (*Hadroplontus litura*) is a stem-boring weevil that attacks Canada Thistle rosettes. Adults lay a few eggs into a cavity (1-2.5 mm wide) on the underside of leaves that are at least 5 cm long over a 4 to 5 week period. Larvae emerge and mine down the leaf's mid-veins into the root crown and sometimes the upper root to feed on callus tissues. Older larvae mine the stem and then emerge to pupate, impacting root reserves for overwintering (https://integratedweedcontrol.com). Canada Thistle Stem Weevil will cause the most damage if it attacks the stem before it grows. Larvae pupate in cocoons of soil particles and the adults emerge in late summer to early fall to feed on the upper leaves and stems. They over-winter in soil litter, and in the spring will emerge to eat rosette leaves by puncturing them. While this will not usually kill the plant, the holes left in the root crown makes the plant susceptible to a fatal rust fungus.

Thistle Seed Head Weevil (*Rhinocyllus conicus*) is the most widely distributed insect for thistle control in the U.S.; however, the U.S. Department of Agriculture prohibits moving these weevils between states because it can feed on native thistles. It has been shown to reduce 90-95% of thistles over an 8 to 9 year period.

Leaf Beetle (*Altica carduorum*) adults feed on all *Cirsium* species; although, it is predicted that it will favor Canada Thistle.

Canada Thistle Stem Gall Fly (*Urophora cardui*) adults lay eggs into stem tissue (https://integratedweedcontrol.com). The developing larvae then cause the plant's formation of a hard woody gall, which takes energy from the plant. Stems, buds, foliage, and flowers above the galls are often malformed or stunted and prone to dry up ahead of unattacked stems, thereby, not contributing energy to root reserves.

GRAZING CONTROLS [Adapted from Jacobs et al. 2007]
Canada Thistle leaves are spiny and unpalatable to most livestock, and thus grazing is not usually used to control populations. However, in Australia intensive sheep grazing reduced the spread of Canada Thistle when compared to ungrazed pastures. In Canada goats have been observed to eat plants, preventing it from flowering.

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

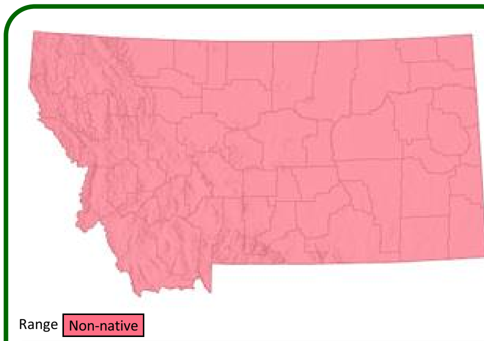
MONTANA Natural Heritage Program

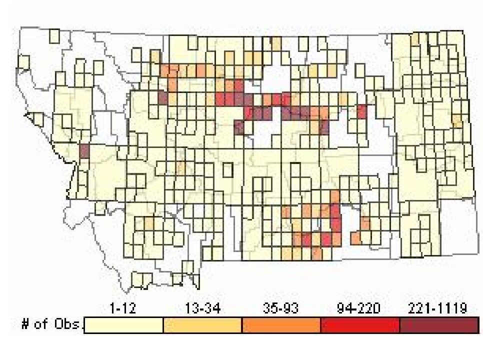
Russian Knapweed
Acroptilon repens

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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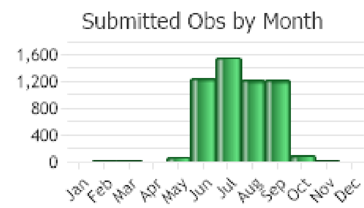

General Description

PLANTS: Rhizomatous perennials that grow in terrestrial habitats (FNA 2006; Lesica et al. 2012). Stems are erect, branched, and grow about 23-100 cm tall. Plants are somewhat cobwebby-tomentose and resin-gland-dotted.

LEAVES: Leaves of the rosette (basal) and lower stem are often absent by maturity (FNA 2006; Lesica et al. 2012). Stem leaves are oblong, 3-10(15) cm long, becoming sessile and smaller upwards. Leaf margins are entire to pinnately lobed.

INFLORESCENCE: Paniculiform or corymbiform. Flower heads are solitary on the ends of leafy branches (Jacobs 2007b). Involucres are broadly ovoid, 9–13 mm high, and somewhat cobwebby (FNA 2006; Lesica et al. 2012). Involucral bracts (phyllaries) are broadly ovate, green or tan below, scarious above, and sharp-pointed. The receptacle is flat with fine scales.

Phenology

Flowering May to September (FNA 2006).

Diagnostic Characteristics

Until more recently the American literature has placed Russian knapweed within the genus *Centaurea*. Molecular phylogenetic studies of the relationships of *Cynareae* genera support the separation of *Acroptilon* from *Centaurea* (Susanna et al. 1995; FNA 2006). *Acroptilon* is also morphologically distinct in that attachment scars on the cypselae occur near the base as opposed to the sides and flower heads lack sterile outer florets (FNA 2006). In addition, *Centaurea* species have a dense bristly receptacle while *Acroptilon* species have a receptacle that is naked, with fine scales, or pubescent (Lesica et al. 2012).

Habitat

Grasslands, roadsides, meadows, fields, and most often on stream terraces; plains, valleys (Lesica et al. 2012). It invades open, disturbed land, particularly where dry (Sheley and Petroff 1999).

Management

Successful management of Russian knapweed targets its extensive root system because it poorly reproduces by seed (Jacobs and Denny 2007). Developing land-use objectives, a desired plant community, and an integrated weed management strategy will make control of Russian knapweed possible (Sheley and Petroff 1999).

BIOCONTOL [Adapted from Jacobs and Denny 2007]
Biological control has been limited and is not effective since Russian knapweed poorly develops and disperses by seed. The Russian Knapweed Stem-gall Nematode (*Subanguina picridis*) has been introduced and established with limited success.

CHEMICAL CONTROL [Adapted from Jacobs and Denny 2007]
Herbicides are effective when properly managed with other tactics. Herbicides that translocate the chemical directly to the roots will be most cost-effective. Surfactants improve the uptake of each chemical listed below. The herbicide type and concentration, timing of chemical control, soil properties, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Many herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control.

Picloram (0.50 pound per acre) applied to the bloom stage has been shown to provide long-term suppression in Montana.

Aminopyralid, clopyralid, and imazapic have also suppressed Russian knapweed when applied during the stages from flower bud to mid-flowering or during fall re-growth; and could be used where Picloram cannot. In Fergus County, clopyralid plus 2,4,-D applied to the bloom stage reduced the density of plants. Further, it accompanied an increase in perennial grasses.

Chlorsulfuron applied in the bloom to post-bloom stage may provide short-term control.

CULTURAL and GRAZING CONTROLS [Adapted from Jacobs and Denny 2007]
Hand-pulling is not a practical control method because of its deep, rhizomatous growth.

Mowing is not very effective at reducing plant density. It may suppress growth initially, but later stimulates regeneration. It might be useful in combination with a herbicide treatment.

Burning can reduce plant biomass, but is not effective at preventing growth, germination, or flowering.

Grazing. There is little information available. Horses that have grazed Russian knapweed for an extended period developed equine chewing disease (*Nigropallidal encephalomalacia*) which is a fatal neurodegenerative disorder (Jacobs and Denny 2007). Russian Knapweed plants have proteins levels similar to alfalfa hay but are too bitter for livestock to eat (Sheley and Petroff 1999).

Revegetation. Grasses used for long-term control must have the following characteristics: a) adapted to the soil and climate, b) easy to establish, c) competitive with weeds, d) palatable and nutritive, particularly for late-season use, e) dry matter productivity, and f) stand longevity (Sheley and Petroff 1999). Although Russian knapweed is allelopathic, control through plant competition should be exploited (Sheley and Petroff 1999). Studies have found that monocultures of Winter Rye (*Secale cereal*) or Wheat (*Triticum aestivum*) reduced Russian Knapweed (Sheley and Petroff 1999). Other research found that Russian Knapweed and Smooth Brome (*Bromus inermis*) competed for limited resources while Russian Knapweed and Western Wheatgrass (*Elymus smithii*) did not compete (Sheley and Petroff 1999).

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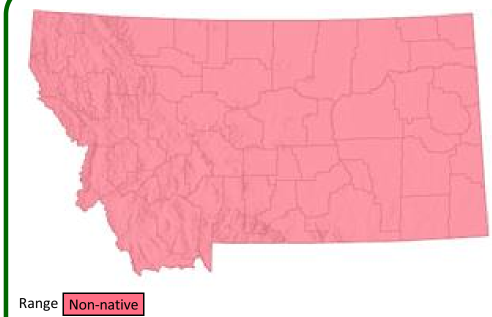
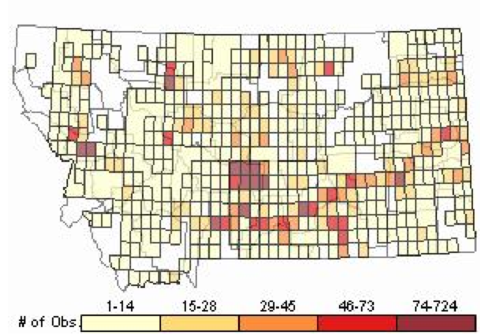
Field Bindweed
Convolvulus arvensis

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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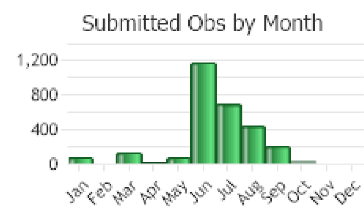


General Description

PLANTS: A rhizomatous, perennial vine. Stems are pubescent, prostrate or twining, branched at the base, and grow 1-6 feet long. Stems are corrugated longitudinally with a thick cuticle. Sources: Jacob 2007; Lesica et al. 2012.

LEAVES: Alternately arranged with blades 1-5 cm long and petioles (leaf stem) 5-25 mm long. Blades are arrowhead-shaped with rounded tips and 2 basal lobes that point backwards and outwards (sagittate). Margins are smooth (entire). Sources: Jacob 2007; Lesica et al. 2012.

INFLORESCENCE: Flowers are solitary and whitish, turning pinkish with age. The 5 petals are fused to form a funnel-shaped flower with almost indistinguishable lobes. The funnel-shape widens upward and flares outward at the edges. The 5 sepals are green with pink margins and overlap. Flower stem (peduncle) is 1–5 cm long with a pair of small bracts just below the flower. Source: Lesica et al. 2012.

The scientific name was given by Linnaeus in 1753. *Convolvulus* comes from a Latin verb "to roll together" or "to entwine" and *arvensis* is Latin adjective for "of the field" (Jacobs 2007). Since the time of Ancient Greeks this plant has been given at least 84 names (Jacobs 2007). The Romans' name meant "a large worm that wraps itself in vines". "Byndweeded" was first applied in England during the 1500s.

Phenology

Plants emerge in spring, flower throughout the summer with appropriate moisture, and die-back with freezing temperatures. See LIFE CYCLE / REPRODUCTIVE CHARACTERISTICS.

Diagnostic Characteristics

Whether by scientific name, common name, or looks these plants are often confused with each other:

Field Bindweed - *Convolvulus arvensis*, exotic and Noxious:
* Vine in the Morning Glory Family (Convolvulcaeae) with a perennial life cycle.
* Flowers are showy, whitish, and solitary.
* Corolla is smaller, 1-3 cm long AND the bracts below the calyx are linear.
* Narrowly arrow-like leaves, but tips are mostly rounded.

Hedge False Bindweed - *Calystegia sepium*, exotic and undesirable:
* Vine in the Morning Glory Family (Convolvulcaeae) with a perennial life cycle.
* Flowers are showy, whitish, and solitary.

* Corolla is larger, 3-7 cm long AND the bracts below the calyx also enclose the calyx.
* Heart-shaped or arrow-like leaves, but tips are pointed.

Black Bindweed - *Polygonum convolvulus*, exotic and undesirable:
* Vine in the Buckwheat Family (Polygonaceae) with an annual life cycle.
* Flowers are very small (not showy), green, and clustered in leaf axils.
* Leaves are more heart-shaped (broader), but with pointed tips AND basal lobes.

Several ***Ipomoea*** species resemble Field Bindweed, but have an annual habit, capitate stigma, longer sepals, and a blue or purple corolla.

Habitat

Field Bindweed grows in cultivated fields, pastures, gardens, lawns, roadsides, railroad beds, and waste places (Jacobs 2007). It tolerates drought (Jacobs 2007). It grows best in rich, fertile soils that are dry to moderately moist, but will persist on poor, gravelly soils (Jacobs 2007). In Montana it is found in the plains and valleys (Lesica et al. 2012).

Management

Persistent control over many years is required to significantly suppress Field Bindweed because of its extensive root system. Combining techniques of cultural, mechanical, biological, and chemical controls will best exhaust the nutrients in its root system (but must be designed to the site's specific conditions). An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed that can promote a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation.

PREVENTION [Adapted from Sheley and Petroff 1999]
Preventing the establishment of Field Bindweed can be accomplished by many practices:
* Learn how to accurately identify Field Bindweed in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Field Bindweed populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs et al. 2007]
Hand-pulling is effective for young populations and small confined spaces if done several times each season to starve the root-system. Hand-pulling plants in combination with other control methods will likely be more successful at longer-term removal of the population.

Tilling fragments the rhizomes allowing Field Bindweed to increase in abundance. A chisel plow encourages re-growth of Field Bindweed. However, tilling every 8-12 days after re-growth for 3-5 consecutive years will reduce root reserves and deplete the seed bank in the soil. Tilling the plant when in flower can be more effective because root reserves of carbohydrates and nitrogen are at their lowest. Upon re-growth, a sweep plow can be used to remove top growth and keep it on the soil surface. After tilling, fields should be re-vegetated as soon as is practical. Appropriate herbicides could be used at the appropriate time to suppress or eradicate Field Bindweed.

Revegetating land with competitive, locally adapted, and desirable forbs and grasses or crops will suppress Field Bindweed populations. Field Bindweed grows in full sunlight and can be suppressed by plants that actively and densely grow in the spring, creating shade. Nonetheless, Field Bindweed will twine upwards around other plants, decreasing their competitive advantage. Establishing competitive, perennial grasses and forbs on disturbed land followed by a prescribed grazing management plant to maintain grass vigor will suppress Field Bindweed and reduce spread by seed. Planting with appropriate native plants is highly encouraged. Refer to Montana Plant Materials Technical Note 46, Seeding Rates for Conservation Species for Montana, and Extension Bulletin EB0019, Dryland Pasture Species for Montana and Wyoming for possible species selection and seeding rates.

Mowing is not generally effective because plants grow along the ground and remain under the height of the blade. Timing mowing with flowering (to decrease seed production) is difficult because plants flower throughout the season and flowers are viable for one-day. Mowing can spread the biological control mite *Aceria malherbae*.

CHEMICAL CONTROLS [Adapted from Jacob 2007]
Biotypes of Field Bindweeds have different tolerances to herbicides. Herbicides can suppress Field Bindweed, will not be 100% effective, and will be more effective when properly integrated with an intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Plants growing in high light and low humidity environments have a thicker leaf cuticle and will absorb less herbicide than leaves of plants grown in a low light and high humidity environment. Herbicide absorption decreases when applied to dusty leaves in fields.

Picloram (1 quart per acre) or in combination with Glyphosate, 2,4-D, or Dicamba can control Field Bindweed for at least one year. Picloram is a restricted-use herbicide because it is persistent, yet mobile in the soil, and can contaminate water and has a long-residual activity.

Many chemical types and techniques for controlling Field Bindweed in cropland are available by consulting your County's Farm Service agency, Weed Coordinators, and MSU extension service (Jacobs 2007).

BIOLOGICAL CONTROLS [Adapted from Jacobs et al. 2007]
Bindweed Gall Mite (*Aceria malherbae*) is native from central and southern Europe to northern Africa. Adults are minute (need a microscope), soft-bodied, and worm-like. They have ring-like body segments and 2-pairs of legs on their head and thorax. The nymps look similar to adults but lack external genitalia. Adults and nymphys are destructive to Field Bindweed. When attacked galls form on actively growing leaves, petioles, and stem tips. Infected leaves fold or twist upward along the mid-vein. Attacked buds don't elongate, but will form a compact cluster of stunted leaves. Bindweed Gall Mites have multiple generations per year. Adults and nymphs over-winter on the root buds of Field Bindweed.

Bindweed Gall Mites can be collected as adults or nymphs during the growing season by selecting stems with galls and then wrapping them around actively growing stem tips of Field Bindweed at other sites. Transplanting releases in the spring or early summer will provides more time for establishment. Mowing can spread this mite. Herbicide treatment and tilling can hurt it.

Field Bindweed Moth (*Tyta luctuosa*) is native from Europe to southern Scandinavia, Asia east to Turkistan and south into India, and Northern Africa. First generation adult moths emerge in May and are active until June. Second generation adult moths are active from July to September. Larvae are caterpillar-like and feed on the plant from May through September. At night they feed on Field Bindweed flowers and leaves and during the day they feed on plant litter. Thus, it is the larvae that damage Field Bindweed plants. Both adults and larvae over-winter on root buds of Field Bindweed. Numerous releases in 2002 in the U.S. have not successfully established this insect.

Bindweed Gall Mite and Field Bindweed Moth can also attack other bindweed plants in the genus *Calystegia*. Information on attacks to non-target species should be shared with the Montana Natural Program Heritage Program Botanist.

GRAZING CONTROLS [Adapted from Jacobs et al. 2007]
Horses may develop an intestinal fibrosis because of the alkaloid pseudotropine that is found in Field Bindweed. Cattle, sheep, and goats will eat the leaves and stems of Field Bindweed. Chickens and hogs will eat leaves, stems, exposed roots and rhizomes, and crowns. However ingestion will cause Field Bindweed to spread. It has been found that the hard seed coat can keep the seeds variable for 144 hours in migratory animals.

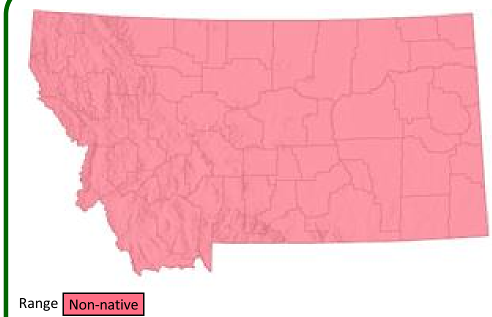
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

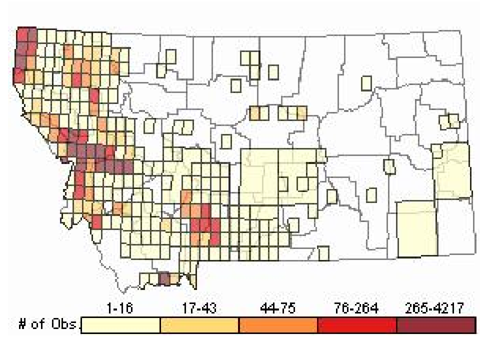
Common Tansy
Tanacetum vulgare

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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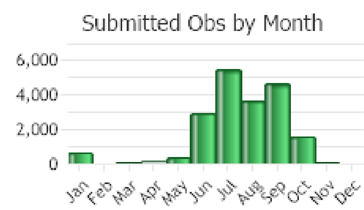


General Description

PLANTS: Rhizomatous, perennial forbs with single, erect stems that grow 40-120 cm tall. Plants have few hairs (glabrate), milky sap, and 'fern-like' leaves. Source: Jacobs 2008; Lesica et al. 2012.

LEAVES: Basal leaves wither early. Stem leaves are alternately arranged and petiolate but become sessile upwards. Leaf blades are about 5-15 cm long, pinnately divided into lanceolate, serrate t sharply lobed leaflets. Leaves are glabrate and gland-dotted (punctate). The main stem between leaflets (rachis) is somewhat winged. Sources: Watson *in* FNA 2006; Lesica et al. 2012.

INFLORESCENCE: Flat-topped corymbiform. 20-200 yellow, rayless, button-like flowers are arranged in flat-topped, compact clusters. Flower heads have an involucre of 5-10 mm across, composed of subequal-sized bracts forming 2-3 rows. Flowerheads lack ray florets (lack petals) and are composed of only yellow disc florets, 1-3 mm tall. The involucre is composed of green, overlapping bracts that have dry, thin, membranous, and translucent margins and tips. The pappus is either crown-like or absent. Sources: Watson *in* FNA 2006; Lesica et al. 2012.

The genus *Tanacetum* is authored by Carl Linnaeus and is derived from the word *athanotos* which implies 'immortality' and references its uses in medicin and preservation. This plant was also called *tanazetum* or *athanacetum* in medieval Latin, and the Old French changed it to *tanesie* which sounds similar to 'tansy'. The specific epithet of *vulgare* is from Latin meaning 'ordinary' or 'common'. Sources: Watson *in* FNA 2006; Jacobs 2008.

Phenology

Flowering July through September (Watson *in* FNA 2006).

Diagnostic Characteristics

Common Tansy and Tansy Ragwort are often confused with one another.

Common Tansy – *Tanacetum vulgare*, exotic and Noxious:
* Yellow flowers lack petals. Flowers have yellow disc florets and lack ray florets.
* Leaves pinnately deeply divided into equal-sized, sharp-toothed lobes.
* Plants have few hairs and leaves are gland-dotted.
* Crushed leaves have a strong menthol- or camphor-like smell from volatile oils.

Tansy Ragwort – *Senecio jacobaea*, exotic and Noxious:
* A biennial to short-lived perennial – pull a mature plant to find a dark-colored taproot.
* Stem leaves similar in size from base to top.
* Flowers with showy, yellow petals. Flower have both yellow ray and disc florets.
* Leaves pinnately deeply-divided into lobes that are shallowly divided.
* Lobe tips of leaves are rounded (not pointed).
* Plants have hairs, often cobwebby hairs when young leaves

Montana has 2 other *Tanacetum* species, both exotic:

Coastmary – *Tanacetum balsamita*, exotic:
* Yellow flowers lack petals. Flowers have yellow disc florets and lack ray florets.
* Leaves are simple and not lobed.

Feverfew – *Tanacetum parthenium*, exotic:
* Flowers have white petals (ray florets) and yellow centers (disc florets).
* Plants are minutely hairy.
* Leaves are pinnately lobed.

Habitat

In Montana it grows in moist, disturbed meadows, often along streams or lakes, along roadsides and railroad tracks in the plains and valleys (Jacobs 2008; Lesica et al. 2012).

Management

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified then an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of spotted knapweed possible (Shelly et al. *in* Sheley and Petroff 1999).

PREVENTION [Adapted from Jacobs 2008]
Seed development must be prevented to reduce or stop spread.
* Prevent vehicles from driving through and animals from grazing within infested areas,
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to an uninfested area,
* Encourage landowners to frequently monitor their land for new infestations and, when found to implement effective control methods.
* Maintain proper livestock grazing management that is more resilient to Common Tansy invasion, and
* Develop educational campaigns to teach people to not pick and transport the yellow flowers.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs 2008]
<u>Hand-pulling</u> is effective for small populations. Hand-pulling should be done when soils are moist in order to remove all rhizomes. Rhizomes can re-sprout. Follow-up treatments will be necessary until all rhizomes and the seed bank are deleted.

<u>Mowing</u> reduces flower and seed production if done before the bloom stage. To maintain the vigor of desirable plants it is recommended to keep a 4-inch or greater stubble height. Plants in seed should not be mowed because it will spread them. <u>Mowers must be carefully and thoroughly cleaned to prevent spreading seeds</u>.

<u>Tilling</u> can control Common Tansy where it occurs in fields. However, disturbing the soil can cause germination and/or fragmented rhizomes to grow. Follow-up treatments will be necessary until all rhizomes and the seed bank are deleted. <u>Farming equipment must be carefully and thoroughly cleaned to prevent spreading seeds</u>.

<u>Prescribed burning</u> should be integrated with other control methods, such as herbicide, grazing, and revegetation management. Burned plants can regenerate from rhizomes. Burning can remove dense dried-up litter. Burning can be used on actively growing plants to remove dead material in preparation for an herbicide application.

<u>Revegetation</u> should be integrated with other control methods, such as herbicide or hand-pulling. Plant competition reduces the invasiveness of Common Tansy and increases the effectiveness of control applications. Suppressing the population through hand-pulling or an herbicide application will help in re-vegetation efforts. Species selected for re-vegetating should be appropriate for management objectives, adapted to the site conditions, and be competitive. Planting with appropriate native plants is highly encouraged. Refer to Montana

Plant Materials Technical Note 46, *Seeding Rates for Conservation Species for Montana*, and Extension Bulletin EB0019, *Dryland Pasture Species for Montana and Wyoming* for possible species selection and seeding rates. Common tansy is often found in all the hydrologic zones of stream banks and riparian areas. Conservation practices that address riparian restoration, such as Channel Bank Vegetation (Code 322), may be needed after common tansy control to maintain hydrological cycles and prevent soil and water resource concerns such as erosion and sedimentation.

GRAZING CONTROLS [Adapted from Jacobs 2008]
Common Tansy is reported to be toxic to livestock. Cattle in the mid-west have reported to abort their fetus. Some ingestion might be okay and wild ungulates might be more tolerant to the plant. It has been suggested that herbivores have a toxin blood-level feedback mechanism, whereby, that when a certain threshold is reached animals will no longer graze Common Tansy.

Sheep have been used to manage Common Tansy in Montana. However, it is recommended that that female sheep be removed from areas with Common Tansy four weeks prior to breeding to avoid any potential reproductive problems. In a Montana study, sheep reduced the above-ground biomass of Common Tansy by 90% while consuming similar levels of perennial grasses. Long-term effects from grazing are unknown, but it is hypothesized that Common Tansy populations would decline allowing perennial grasses to increase.

CHEMICAL CONTROLS [Adapted from Jacobs 2008]
An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified then an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of spotted knapweed possible (Shelly et al. *in* Sheley and Petroff 1999). For up to date information on herbicides, consult Greenbook.

Common Tansy had been controlled using Metsulfuron, chlorsulfuron, or by mixing them. These chemicals are not selective and can kill shrubs, grasses, and other broad-leaf plants. Applications can be applied to plants growing to the water's edge, but must not be applied directly to surface water of any depth. A non-ionic surfactant at 0.5% volume/volume or methylated seed oil at 2% volume/volume in a spray solution is recommended. Visible effects of the herbicides may not be apparent until 45 days after the treatment.
* metsulfuron applied at a broadcast rate of 0.5 ounces per acre at the late bud stage (late June) provided almost 100% control for one year for a population growing on moist soil.
* metsulfuron and chlorosulfuron mixed together at the individual rate of 0.25 ounce per acre had similar results as above.

At sites without a high water table, Picloram applied to actively growing plants in the bud to bloom stages can be used to control Common Tansy. Picloram mixed with dicamba and applied to the budg stage provided 98% control for 24 months after treatment.

Where Common Tansy is growing in water, imazapyr applied at 1 quart per acre may provide some control.

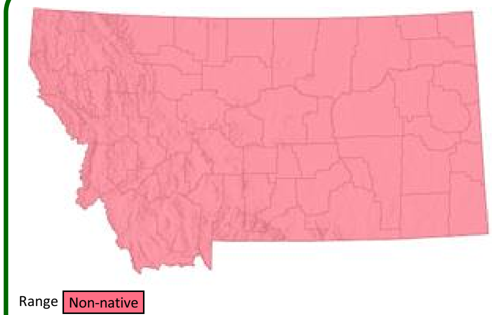
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

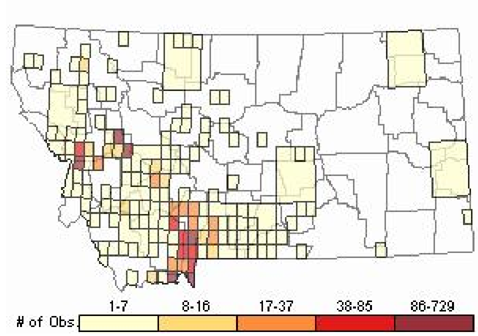
Hoary False-alyssum
Berteroa incana

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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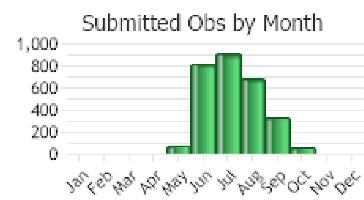


General Description

PLANTS: Annuals with erect, branched stems and 20–75 cm tall. Plants are densely hairy with star-shaped, appressed trichomes (stellate pubescence) that give it a gray appearance. Source: Lesica et al. 2012.

LEAVES: Basal leaves have petioles, are widest near their tip (oblanceolate) with entire (smooth) margins, and whither by flowering. Stem leaves are sessile, oblanceolate, 1–3 cm long, and grow erect but become reduced upwards. Source: Lesica et al. 2012.

INFLORESCENCE: A narrow, simple or compound, many-flowered raceme. Flowers consist of 4 green sepals with white margins of 2–3 mm long and 4 white petals of 4–6 mm long. Petals are narrow at the base, flare upwards, and are deeply notched, and may appear 8-petalled. Sources: Lesica et al. 2012; Parkinson et al. 2017.

Berteroa is named for Carlo Giuseppe Bertero, 1789-1831, an Italian physician and botanist who settled in Chile (FNA 2003). The common name of Hoary False-alyssum references the plant’s grayish appearance from stellate hairs (hoary) and its original treatment by Carl Linnaeus who placed it in the genus *Alyssum*.

Phenology

Flowering May through September (FNA 2003).

Diagnostic Characteristics

There are many white-flowered members of the Mustard Family, both native and exotic. It is recommended that identifications be made using a plant manual designed for Montana. Mustards have flowers with 4 sepals, 4 petals, and 6 stamens (4 long and 2 short) among other characteristics.

Hoary Alyssum – *Berteroa incana*, exotic and Noxious:
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are not notched at their tip.
* Each of the 4 petals are notched, making the flower appear 8-petaled.
* Plants have star-shaped hairs; whereas, *Lepidium* species have simple hairs or none.
* Stem leaves are widest near their tip (oblanceolate), sessile on the stem, and point upwards.

Field Pennycress – *Thlaspi arvense*, exotic:
* White-flowered, annual plants that grow from taproots and have mature silicles (fruits) that are large, deeply notched at their tip, flat, and with very wide wings, resembling a penny.

* Lower stem leaves have petioles. Upper stem leaves are sessile, clasping, auriculate (lobed like an arrow), and with smooth to toothed margins.

Little Seed False Flax – *Camelina microcarpa*, exotic:
* Pale yellow-flowered, annual plants that grow from taproots and have mature silicles that lack a notch, lack hairs (glabrous), have a style (beak) of 5-7 mm long and a stalk of 9-15 mm long.
* Plants have simple or branched hairs, but not star-shaped hairs.

Perennial Pepperweed – *Lepidium latifolium*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* White petals are not notched.
* Silicles are glabrous or sparsely pilose (long soft hairs) with a very short style of 0.1 mm long or less. Silicle stems (pedicels) are 2-5 mm long.
* Stem leaves are sessile, but do not clasp around the stem.

Whitetop – *Lepidium draba*, exotic and Noxious:
* White-flowered plants that grow from creeping roots (rhizomes) and have mature silicles (fruits) that are not notched at their tip.
* White petals are not notched.
* Silicles are glabrous (lack hairs), flattened, and their base is cordate (heart-shaped or indented). Silicles are tipped with a style of 1-1.5 mm long. Silicle stems (pedicels) are 5-12 mm long.
* Stem leaves are auriculate (lobed like an arrow) and clasping around the stem.

Common Yarrow – *Achillea millifolium*, native and desirable:
* Member of the Aster or Sunflower Family.
* Bright-white flowers arranged closely in a flat-topped inflorescence.
* Leaves are 2-3 times pinnately dissected, appearing fern-like or bushy like a squirrel's tail.

Sources: Jacobs and Mangold 2007; FNA 2010; Graves-Medley and Mangold 2011; Lesica et al. 2012.

Habitat

Hoary False-alyssum commonly grows in fields, along roadways, on trails, and along gravelly banks of streams and lakes in the plains, valleys, and montane areas of Montana (Lesica et al. 2012; Parkinson et al. 2017).

Management

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed to promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of Hoary False-alyssum possible.

Plants are easily spread across long distances in contaminated hay, lawn, and other forage seed and across short distances by vehicles, farm equipment, and animal grazing (Parkinson et al. 2017).

PREVENTION [Adapted from Parkinson et al. 2017]
Seed development must be prevented to reduce or stop spread. Spread can be prevented or reduced by:
* Preventing vehicles from driving through and animals from grazing within infested areas,
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to an uninfested area,
* Encouraging landowners to frequently monitor their land for new infestations and, when found to implement effective control methods.
* Maintain proper livestock grazing management that is more resilient to Hoary False-alyssum invasion, and
* Developing educational campaigns to teach people to not pick and transport the white flowers.

PHYSICAL and CULTURAL CONTROLS [Adapted from Parkinson et al. 2017]
Hand-pulling is effective because the plants are annuals with shallow taproots. Plants should be pulled when soil is moist to better extract the entire root; roots that remain in the soil could re-generate. Hand-pulling needs to occur repeatedly until the seed bank is depleted. Plants with seeds should be burned if conditions permit or sealed in plastic to desiccate or rot before disposing into the trash

Mowing will not control Hoary False-alyssum and does remove other plants that could shade-out or compete against it. Mowing also disperses seeds. In certain situations and when combined with irrigation and nutrient management mowing to a 6-inch stubble height could increase the vigor of desirable plants that would shade-out and reduce Hoary False-alyssum seed production. Mowers must be carefully and thoroughly cleaned to prevent spreading seeds.

Shallow Tilling that severs the tap root below the root crown will kill plants and increase seed germination. Therefore, repeated tilling should occur to deplete the seed bank. Alternatively, tilling in combination with other treatments (example, hand-pull, herbicide, revegetation) can control Hoary False-alyssum.

Prescribed Burning can kill plants and seed if done before silicles open. However, burning exposes soils and creates a high light condition that might be conducive for invasion. Fire in combination with other treatments might be useful. An integrated weed management plan and diligent monitoring is necessary to develop an effective plan.

Revegetation is effective at controlling Hoary False-alyssum plants and seed production. Sustainable suppression requires revegetation with desireable plants that compete well for light, water, and nutrients. Desirable vegetation should be appropriate for the management objectives, adapted to the site conditions, be competitive. Planting with appropriate native plants is highly encouraged. Refer to Montana Plant Materials Technical Note 46, *Seeding Rates for Conservation Species for Montana*, and Extension Bulletin EB0019, *Dryland Pasture Species for Montana and Wyoming* for possible species selection and seeding rates.

Irrigation and Fertilization can be used to increase production of other plants because Hoary False-alyssum prefers drier conditions and thrives on sites with poor soil fertility. Used together proper irrigation and nutrient management can prevent invasion or reduce infestations. However, these treatments should also be appropriate for the site conditions and land management objectives. Revegetation should also likely be included in the treatment plan.

CHEMICAL CONTROLS [Adapted from Parkinson et al. 2017]
As of 2018 few herbicide formulations list Hoary False-alyssum on their labels. For up to date information on herbicides, consult Greenbook.

For control in rangelands and grass pastures products that contain the active ingredient Metsulfuron-Methyl can be effective. An anecdotal report suggests that 2,4-D at the rate of 1 quart per acre provides effective and economical control in rangelands and pastures.

As of 2018 there are no broadleaf herbicides labeled for control of Hoary False-alyssum on grass/legume mixed pastures because these chemicals can harm legumes. For highly disturbed areas with Hoary False-alyssum Glyphosate applied at 1-2 quarts per acre controls all plants, but must be followed with a revegetation plan.

It is often standard to apply herbicides to actively growing plants before they bolt. The research in southwest Montana found that several herbicides decreased Hoary False-alyssum seed production and viability across various growth stages from early to late flowering.

GRAZING CONTROLS [Adapted from Parkinson et al. 2017]
Hoary False-alyssum establishes and reproduces best in overgrazed land; therefore, proper grazing management techniques that maintain the competitiveness of forage plants is necessary.

In general grazing animals have not been used to control Hoary False-alyssum. Cattle can eat Hoary False-alyssum, but will generally select for more digestible plants. In a study goats were found to select for weed-free hay more than for hay mixed with Hoary False-alyssum. In a forage field study conducted in Minnesota, lambs rejected Hoary False-alyssum. In sufficient quantities Hoary False-alyssum is toxic to horses (refer to the Ecology Section).

BIOLOGICAL CONTROL [Adapted from Parkinson et al. 2017]
Currently no biological control agents are available.

Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension

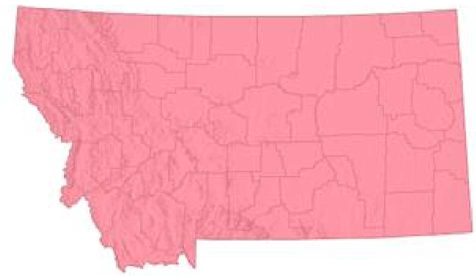
Weed Publications at Montana State University Extension - MontGuides

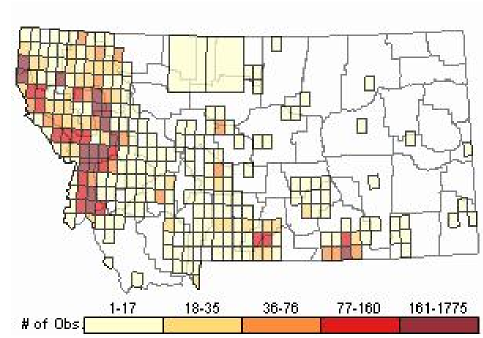
Sulphur Cinquefoil
Potentilla recta

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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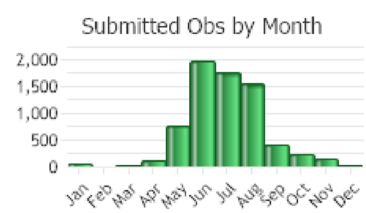


General Description

PLANTS: Perennial forb that grows from a simple to branched caudex. Stems are singular to several, erect, and 20-50 cm tall. Stems have hispid hairs – long, straight, stiff, and perpendicular to the stem. Plants grow from a taproot with some shallow, spreading roots. Source: Rice *in* Sheley and Petroff 1999; Lesica et al. 2012

LEAVES: Leaves are arranged alternately. In outline leaf blades are somewhat round and 2-7 cm long. Leaves are palmately divided into 5 to 7 lanceolate, dentate leaflets with spreading hairs. Leaf size decreases upwards on stem. Petioles have hispid hairs which are perpendicular to the stalk. Basal leaves are similar. Source: Lesica et al. 2012

INFLORESCENCE: Yellow flowers are arranged in an open, flat-topped cyme (above the height of the leaves). 5 green sepals are lanceolate in shape, strongly veined, and 4–7 mm long. Bracteoles alternate with and appear similar to the sepals. 5 petals are light (sulphur) yellow, 6–10 mm long, longer than the sepals, and notched. Source: Lesica et al. 2012

Phenology

Flowers in late spring through summer (Ertter and Reveal *in* FNA 2014).

Diagnostic Characteristics

Montana has at least 30 *Potentilla* or Cinquefoil species (Lesica et al. 2012). Readers are encouraged to learn their identifiable traits before implementing control on an unrecognized plant!

Sulphur Cinquefoil – *Potentilla recta*, exotic and Noxious:
* Fewer basal leaves with numerous stem leaves.
* Plants with long hairs perpendicular to their surface.
* Inflorescence ‘flat-topped’ and bright, light-yellow flowers.
* Taproot has short branches.
* Plants are more yellowish-green in comparison to other Potentilla plants.
* Leaflets are serrated about half-way to their mid-veins.
* Seeds with a net-like pattern on their coat.

Fanleaf Cinquefoil – *Potentilla gracilis*, native and desirable:
* Many basal leaves and relatively fewer stem leaves.
* Plants with short, spreading hairs.
* Underside of leaves have dense, woolly hairs.
* Plants are rhizomatous.
* Flowers are brighter/darker yellow.
* Leaves are green to gray-green.

* Leaflets are serrated more than half-way to their mid-veins.
* Seeds have a smooth coat.

Habitat

Grasslands, meadows, pastures, and disturbed forests in the plains, valleys, and montane zones of Montana (Lesica et al. 2012).

Management

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified an integrated weed management strategy can be developed to promote a weed-resistant plant community and that serves other land-use objectives such as livestock forage, wildlife habitat, or recreation.

PREVENTION [Adapted from Rice *in* Sheley and Petroff 1999]
Preventing the establishment of Sulphur Cinquefoil can be accomplished by many practices:
* Learn to accurately identify Sulphur Cinquefoil in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Sulphur Cinquefoil populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Rice *in* Sheley and Petroff 1999]

Hand-digging is effective for removing plants and eradicating small populations. As with any plants, long-sleeves and gloves should be worn to protect one’s skin. Hand-digging is easiest when soils are moist. Digging tools can easily be placed under the root-crown to remove the plant.

Mowing is not effective because the plants respond by developing heftier roots and more above ground stems.

CHEMICAL CONTROLS [Adapted from Rice *in* Sheley and Petroff 1999]
Herbicides can be effective, especially when properly integrated with intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Picloram (0.25 pound acid equivalent (ae) per acre) applied in the spring to plants up to late bud stage or in the fall can provide several years of control. Residual activity of Picloram suppresses re-establishment from seed germination, but should only be used on upland sites and not around water.

2,4-D ester (1.0 pounds ae per acre) applied in the spring to plants at the rosette to bud stages will provide one year of good control. It may be better to use at sites near water.

Clopyralid is not effective on Sulphur Cinquefoil plants.

GRAZING CONTROLS [Adapted from Rice *in* Sheley and Petroff 1999]
Sulphur Cinquefoil is unpalatable to most livestock because of its high tannin content. On open range or in places with low stocking rates livestock have been found to eat the flowers of Spotted Knapweed (*Centaurea stoebe*) while ignoring Sulphur Cinquefoil in places where they co-exist. When Sulphur Cinquefoil is eaten it tends to be flowers or buds scattered across plants. Therefore, domestic grazing can favor the replacement of Spotted Knapweed, which is a short-lived perennial, with the longer-lived Sulphur Cinquefoil and the continual decline of native forbs and grasses.

Sheep and goats can eat Sulphur Cinquefoil, but is not shown to be very effective. Where animals are known to eat Sulphur Cinquefoil, they should be corralled for at least 3 days before moving into uninfested areas (Frost et al. 2013?).

BIOLOGICAL CONTROLS [Adapted from Rice *in* Sheley and Petroff 1999]
Using biological control organisms on Sulphur Cinquefoil has been problematic because of its genetically close relationship to strawberries (*Fragaria* spp.). Some root- and crown-boring insects found on Sulphur Cinquefoil plants in Montana were also found to be pests on strawberries (Rice *in* Sheley and Petroff 1999).

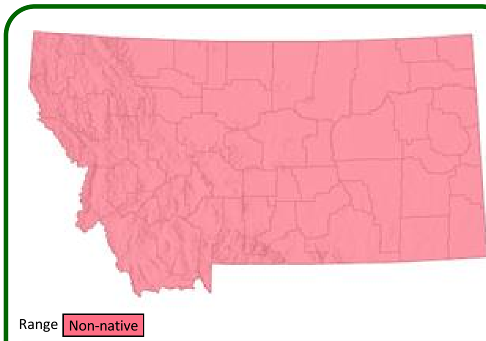
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

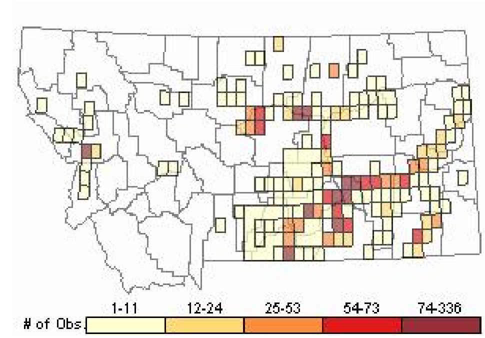
Salt Cedar
Tamarix ramosissima

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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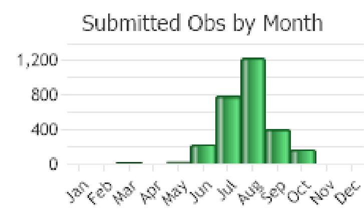


General Description

PLANTS: Deciduous large shrubs from 1-5 meters tall. Numerous slender stems arise from a branched caudex. Bark is thin, reddish-brown, but with age becomes furrowed and ridged. Source: Lesica et al. 2012; Jacobs and Sing 2012.

LEAVES: Leaves are arranged alternately. Leaves resemble cedar because they are small, 1-2mm, scale-like, and clasping the branches; however, unlike cedar leaves are deciduous. Leaves are succulent and broadly lanceolate. On the underside of leaves are salt-secreting glands. Source: Lesica et al. 2012; Jacobs and Sing 2012.

INFLORESCENCE: Small pink (occasionally white) flowers are arranged in narrow, drooping clusters (spike-like, bracteate racemes) of 15–40 mm long. Flowers are perfect, regular, hypogenous. The 5 sepals are separate, and 1 mm or less long. The 5 pink petals are separate, ovate, about 2 mm long. Flower have 5 stamens and 3-4 stigmas. Source: Lesica et al. 2012; Jacobs and Sing 2012.

Tamarisk is from the Arabic *tamr* which refers to a tree with dark bark (Gaskin *in* FNA 2015). *Tamarix* is derived from the Tambre River which in ancient times was referred to as Tamaris River in Spain (Jacobs and Sing 2012).

Phenology

Flowers from spring through September, sometimes October (Jacobs and Sing 2012).

Diagnostic Characteristics

5-Stamen Tamarisk (*Tamarix chinensis*) and Salt Cedar (*Tamarix ramosissima*) are genetically distinct species that do not naturally overlap in native geographical ranges. 5-Stamen Tamarisk occurs from western China to Japan which is east of central China. Salt Cedar occurs from Turkey to Japan, which is west of central China. In North America where both species have been introduced, hybrids have been found (Gaskin *in* FNA 2015). Hybrids occur in Montana as well. Montana's plants best fit *Tamarix ramosissima* (Lesica et al. 2012). Hybridized specimens as well as sterile collections of Salt Cedar have led to many misidentifications (Gaskin *in* FNA 2015). Directions for how to dissect flowers and find the nectar disc and other characteristics is described by Gaskin *in* FNA 2015.

Salt Cedar - *Tamarix ramosissima*, exotic and noxious:
* Wispy shrubby growth form that often grows in riparian areas.
* Deciduous leaves that are very small, grey-green, and are appressed to twigs.
* Short racemes of tiny pink flowers that can cover the shrub for most of the growing season.

* Margins of sepals are denticulate.
* Stamen filaments originate from the edge of the nectar disc.
* Montana herbarium specimens at time of publication appear to better represent Salt Cedar (Lesica et al. 2012).
* It will rarely hybridize with Athel Tamarisk> (*Tamarix aphylla*) (Gaskin *in* FNA 2015).

5-Stamen Tamarisk - *Tamarix chinensis*, exotic and noxious:
* Wispy shrubby growth form that often grows in riparian areas.
* Deciduous leaves that are very small, grey-green, and appressed to twigs.
* Short racemes of tiny pink flowers that can cover the shrub for most of the growing season.
* Margins of sepals entire.
* Some or all filaments originate from below the nectar disc.
* Reported to occur in Montana by Gaskin *in* FNA 2015; however, University of Montana and Montana State herbarium specimens appear to better resemble Salt Cedar (Lesica et al. 2012).
* It will rarely hybridize with Athel Tamarisk (*Tamarix aphylla*).

Rocky Mountain Juniper - *Juniperus scopulorum*, native:
* An evergreen shrub or small tree that can grow in some riparian areas and in upland habitats.
* Leaves are small, dark green, and appressed to twigs. First year needles are short and needle-like.
* Plants are a true conifer with separate male and female plants. Male plants produce ephemeral cones and female plants produce glaucous-blue berries.

Western Redcedar – *Thuja plicata*, native and desirable:
* An evergreen large tree that grow in some riparian areas and other moist habitats.
* Leaves are small, dark green, glossy, and appressed to twigs. Twigs are flattened and drooping.
* Plants are a true conifer that bear female and male cones.

Cedar, exotic and cultivated:
* An evergreen shrub and true conifer (cultivated) planted as row hedges and in yards.

Habitat

Salt Cedar grows along streams, stream terraces, saline meadows along waterways, lakes, irrigation ditches, and reservoirs in the plains zone of Montana (Lesica et. al 2012). It grows well in areas that exhibit repeated cycles of inundation and drawdown, particularly where there is disturbance, depressional wetlands, or stock ponds, and where prolonged inundation is absent (Lesica and Miles 2004).

Management

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed.

* Where willows and cottonwood grow, beavers might need to be controlled in order to allow native shrubs to mature and provide the shade that will reduce Salt Cedar from establishing (Lesica and Miles 2004).

* Areas that exhibit repeated cycles of inundation and drawdown will be susceptible to Salt Cedar invasion, particularly where there is disturbance, depressional wetlands, or stock ponds and where prolonged inundation is absent (Lesica and Miles 2004).

* Management can curtail Salt Cedar by promoting actions that favor native cottonwoods and willows, such as reducing livestock damage and maintaining flood flows that are timed with cottonwood seed dispersal (Lesica and Mills 2001).

PREVENTION [Adapted from Jacobs and Sing 2012]
In riparian areas that are not infested with Salt Cedar, surveys should be conducted every 3 years in order to detect new populations. In riparian areas within 25 miles of known populations, intensive surveys should be conducted to detect new populations and prevent establishment. Implement control(s) to eradicate new populations.

Other ways to prevent or reduce spread includes:
* Learn how to accurately identify Common St. John's-wort in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.

* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Common St. John's-wort populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Jacobs and Sing 2012]
Hand-pulling is not usually effective because a huge number of seedlings germinate when conditions are good. Most seedlings won't survive. Those that become established are too difficult to hand-pull.

Mowing, Chaining, Cutting, Prescribed Burningand Tilling are not effective because these stimulate re-sprouting and require follow-up treatments.

Controlled flooding for greater than 3 months at reservoirs and stock ponds may reduce Salt Cedar populations, as well as native trees and shrubs. After flooding re-vegetation may be necessary.

Natural flooding cycles on free-flowing streams is believed to control Salt Cedar establishment. It can scour seedlings, deposits of salt, and accumulations of leaf litter. Manipulating water releases from dams that mimics natural flows may favor establishment of native woody riparian vegetation and select again Salt Cedar. Salt Cedar seedlings of up to 5 weeks old are more susceptible to summer flooding then are established plants. Prolonged flooding of 3 or more months can kill Salt Cedar (Lesica and Miles 2004).

Re-vegetation that uses native plants adapted to the particular site conditions creates shade that will negatively impact Salt Cedar. Guidance on seeding and planting techniques can be found in the Riparian Forest Buffer (Code 391) and Riparian Herbaceous Cover (Code 390) practice standards and specifications.

BIOLOGICAL CONTROL [Adapted from Jacobs and Sing 2012]
Biological control has been restricted due to the perceived threat posed to the federally threatened Southwestern sub-species of the Willow Flycatcher (*Empidonax traillii*).

The Northern Tamarisk Beetle (Diorhabda carinulata) which originates from northwestern China and eastern Kazakhstan has been released in Montana. The adult and larval stages feed mostly on young leaves and less on mature leaves. They can occasionally feed on the epidermis of twigs and first-year shoots which can cause the tip and of the twig to dry-up and fall off. In Montana the beetles have not been successful possibly due to predation or environment factors of spring drought or spring flooding.

CHEMICAL CONTROL [Adapted from Jacobs and Sing 2012]
Herbicides can be effective, especially when properly integrated with intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Basal Bark Treatment: For scattered shrubs, a single low volume basal bark treatment using a 30% solution of trycolpyr mixed with a commercially available basal bark oi, number 1 or 2 dielsel fuel, or kerosene is high effective and practical. The circumference of all stems from the basal root crown upwards to 18 inches should be sprayed until thoroughly wet but not dripping. The treatment can be used except when the ground is frozen or flooded. It will take 1-2 years for the herbicide to move through the plant, particularly its roots, and kill it. This chemical can be used along non-irrigation ditch banks, seasonally dry wetlands, and transitional areas between wetlands and uplands where surface water is not present.

Cut Stump Treatment: In areas where stems can be cut, triclopyr or glyphosate can be applied directly to the cut stump. It must be applied within 1 hour to prevent the plant from sprouting. The herbicide can be applied to wet the wood and surrounding cambium. The treatment can be used except when the ground is frozen or flooded. Stems that are removed should be burned in order to make sure they don't re-sprout.

Foliar Treatment: Where stands are dense, imazapyr (2 quarts per acre) or imazapyr plus glyphosate (1 quart per acre each) are the most effective for spraying Salt Cedar foliage. Applications in late summer or early fall (August to September) are most effective. Spot treatments can be followed by a 1 percent solution of imazapyr with a surfactant.

GRAZING CONTROL [Adapted from Jacobs and Sing 2012]

Salt Cedar is nutritionally poor for cattle, sheep, and goats; however, they will eat it. Livestock tend to select native species over Salt Cedar, which then favors the establishment of Salt Cedar. When Salt Cedar is eaten, cattle graze on young sprouts in the early spring. Confining domesticated animals to graze Salt Cedar can work to remove above ground foliage, but will encourage sprouting. Boer Goats have been used to intensively graze Salt Cedar. Intensive grazing following by a chemical application will improve the effectiveness of the herbicide.

In areas were cottonwood and willows grow, livestock management should encourage the regeneration and growth of these native woody species because their shade will later discourage Salt Cedar (Lesica and Miles 2004).

Montana's Salt Cedar Task Force is led by Rachel Frost who can be contacted at: (406) 454-0056 or mrcdc@macdnet.org

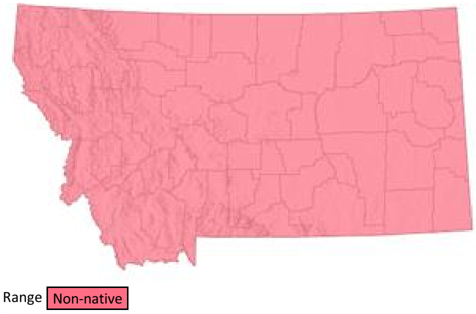
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

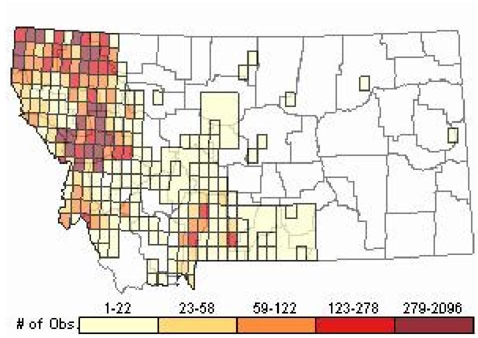
Oxeye Daisy
Leucanthemum vulgare

View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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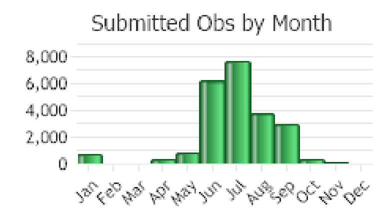


General Description

PLANTS: A rhizomatous perennial forb with erect stems that grow 20-80 cm tall. Plants are glabrous (lacks hairs). Plants have basal and erect stems. Source: Lesica et al. 2012

LEAVES: Basal leaves have long petioles (stalks). Basal leaf blades are spoon-shaped to round and shallowly lobed (crenate). Cauline leaves are alternately arranged, petiolate but become sessile upwards. Sources: Lesica et al. 2012; Davis and Mangold 2018.

INFLORESCENCE: Flower heads are mostly solitary on long peduncles (stems). Flower heads are 1-2 cm wide and have white ray florets and yellow disk florets. Involucral bracts are, uneven, in 2-4 rows, and green with brown scarious margins. The flower head's receptacle is nearly flat and naked (lacks awns, scales or bristles between the disk florets/achenes). The 15-35 ray florets have white petals of 1-2 cm and are fertile. The numerous disk florets have yellow petals, lack a pappus, are 2-3 mm tall, and have flattened style branches. Sources: Lesica et al. 2012; Davis and Mangold 2018.

The genus *Leucanthemum* comes from the Greek words *leuco-* for white and *anthemon* for flower. The specific epithet *vulgare* means common.

Phenology

Oxeye Daisy flowers from spring to fall (FNA 2006).

Diagnostic Characteristics

Oxeye Daisy – *Leucanthemum vulgare*, exotic and noxious:
* Tall plants (20-80 cm) that have the stereotypical “daisy” appearance of white petals with yellow centers.
* Leaves are lobed or toothed less than half-way to their mid-vein.
* Involucral bracts are in 2 to 5 rows and unequal, and with very few hairs (glabrate).

Lawn Daisy - *Bellis perennial*, exotic and undesirable:
* Short (5-15 cm) plants that have the stereotypical “daisy” appearance of white petals with yellow centers.
* Leaves are entire to toothed.
* Involucral bracts are in a single row, narrowly ovate, and with hairs (strigose).

Habitat

In Montana Oxeye Daisy grows mostly in moist area along roadsides and in fields, meadows, forest openings, and pastures converted from forest in the valleys to montane zones (Lesica et al. 2012). Elsewhere it is also found along railroad embankments and waste areas.

Management

An integrated vegetative management approach provides the best long-term control of Oxeye Daisy. It requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified the integrated weed management strategy can promote a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed, making control of Oxeye Daisy possible.

PREVENTION
Oxeye Daisy is often encouraged as an ornamental to plant, and has been found in numerous seed mixes. Users should carefully read packaging labels and not purchase if its scientific names or common names or any synonyms are listed.

Seed development must be prevented to reduce or stop spread.
* Prevent vehicles from driving through and animals from grazing within infested areas,
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to an uninfested area,
* Encourage landowners to frequently monitor their land for new infestations and, when found to implement effective control methods.
* Maintain proper livestock grazing management to encourage competitive vegetation, and
* Develop educational campaigns to teach people to not pick and transport the white flowers.

PHYSICAL and CULTURAL CONTROLS [Adapted from Olson and Wallander *in* Sheley and Petroff 1999]
Hand-pulling can be effective for small or new infestations. It should be done before plants have flowered. Gloves should be worn to protect skin. Plants should be bagged, allowed to desiccate or rot, and then be deposited in the landfill.

mowing as soon as flower buds develop is effective to reduce seed production. However, mowing will stimulate shoot production, and subsequent flowering could occur if conditions are good. Not mowing fields with Oxeye Daisy is also not a good control method because over-time Oxeye Daisy will likely succeed.

Tilling that is repeated in the same growing season can kill plants because rhizomes grow shallow in the soil profile. Seeds in the seedbank will germinate, and require follow-up treatment.

GRAZING CONTROLS [Adapted from Olson and Wallander *in* Sheley and Petroff 1999]
Horses, sheep and goats will graze Oxeye Daisy, while cattle and pigs avoid it because it is acrid. Information on how horses, sheep, or goats can be used to control Oxeye Daisy was not found.

Horses, sheep, and goats that graze where Oxeye Daisy grows should be retained in a holding pen before moving into uninfested areas.

Grazing management that maintain vigorous growth of desirable plants will help compete against Oxeye Daisy.

CHEMICAL CONTROLS [Adapted from Olson and Wallander *in* Sheley and Petroff 1999]
The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Consult your County Extension Agent and/or Weed District for more information on herbicidal control. Chemical information is also available at Greenbook.

Oxeye daisy is moderately resistant to some 2,4-D-based herbicides except at high rates of 5 pounds per acre.

One study found that applying 80 pounds of nitrogen fertilizer was a more cost-effective treatment after 7 years that using herbicide alone or in combination with fertilizer. The treatment increased grass yields by 500% over this time. Herbicides can kill plants, while fertilizers promote growth of desirable forage.

Picloram (1.5 pint per acre) mixed with 2,4-D (1 quart) per acre was applied to a heavily infested Oxeye Daisy site in 1990. The treatment provided 100% control, but is not recommended to use for a long-term control method. Herbicides often have to be re-applied every 2-3 years because of the seed bank.

The seed bank and long length of seed viability will allow Oxeye Daisy to return for many years. Therefore, control methods that encourage the growth of vigorous, competitive desirable plants is recommended.

BIOLOGICAL CONTROLS [Adapted from Jacobs et al. 2015]
Currently no biological control agents are available.

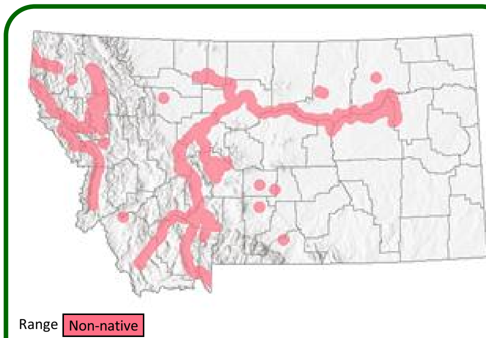
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

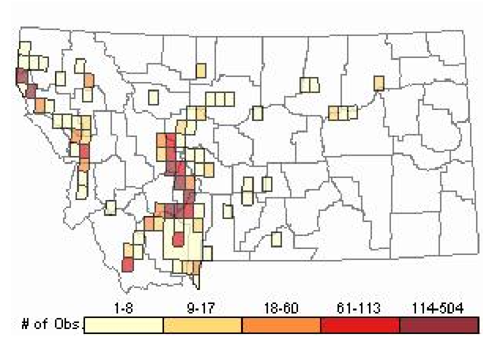
Curly-leaf Pondweed
Potamogeton crispus

View in Field Guide

Noxious Weed: Priority 2B
Aquatic Invasive Species
Non-native Species
Global Rank: G5
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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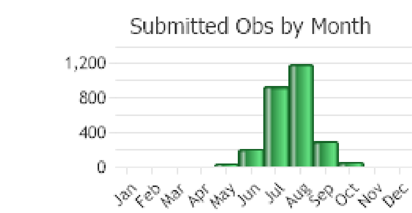


General Description

PLANTS: Aquatic perennials that produce turions (starch-containing stem buds), terminal on a stem or in leaf axils. Stems are flat and alternately branched. Sources: Parkinson et al. 2016; Lesica 2012; Haynes and Hellquist *in* Flora of North America (FNA) 2000).

LEAVES: All leaves are submersed; true-floating leaves are absent. Leaves are alternately arranged, fairly stiff, and range in color from red-brown to olive-green. Leaves are linear-oblong (3–8 cm × 4–10 mm) with serrate, wavy margins and a sessile, clasping base. Leaf tips are rounded. Stipules are 3–7 mm long and shred early. Sources: Parkinson et al. 2016; Lesica 2012; Haynes and Hellquist *in* Flora of North America (FNA) 2000).

INFLORESCENCE: Emersed spikes of 1–2 cm long, continuous, and composed of inconspicuous flowers (Lesica 2012, Parkinson et al. 2016).

Phenology

Inflorescence develops in early summer. Turions germinate in fall, grow shoots and roots in late winter to early spring, and go dormant in mid-summer to fall.

Diagnostic Characteristics

For positive species identification, all members of Potamogeton should be collected in fruit. Montana has more than 20 species of pondweeds, and users of this field guide are encouraged to identify specimens using the Manual of Montana Vascular Plants (Lesica 2012).

The combination of slightly flattened stems and submersed leaves with wavy margins (resembling a lasagna noodle) that are also minutely toothed and clasp the stem distinguishes Curly-leaf Pondweed. Young leaves may lack wavy margins. Leaf shape is also linear to oblong. Turions are present in fall and winter (DiTomaso and Healy 2003).

Richardson’s Pondweed (*Potamogeton richardsonii*) also has alternately arranged leaves that clasp the stem and have wavy leaf margins, but margins lack teeth (entire), leaf tips are pointed, and leaf shape is lanceolate to ovate (Parkinson et al. 2016). The stems are round with little branching.

White-stemmed Pondweed (*Potamogeton praelongus*) also has alternately arranged leaves that clasp the stem and have minutely wavy leaf margins, but margins lack teeth (entire), leaf tips are pointed, and some leaves are greater than 10cm long (Parkinson et al. 2016). The stems are round and zig-zag, and there is little branching.

Habitat

Shallow to deep (18 feet), fresh or saline water of ponds, lakes, and slow streams in the plains and valleys (Lesica 2012; Parkinson et al. 2016). It can tolerate a moderate current (Parkinson et al. 2016). It is typically found at depths from 3.2 to 10 feet. It grows best in alkaline, calcareous water (Parkinson et al. 2016). Substrates range from sandy to hard bottoms; it grows best on substrates that contain 10-25% organic matter and are not too coarse or too fine (Parkinson et al. 2016).

Management

Curly-leaf Pondweed has been a listed noxious weed in Montana since 2010. Its spread from one water body to another has primarily occurred through plant fragments containing turions that are on boat trailers and recreational equipment (Parkinson et al. 2016).

PREVENTION (adapted from Parkinson et al. 2016)
* Thoroughly rinse any mud and debris from all equipment and wading gear, and drain the water from the boat before leaving access areas. Use boat-washing stations when available.
* Remove all plant fragments from the boat, propeller, and boat trailer.
* Dry boats and equipment for 5 days before transporting them to a new water body.
* Do not dispose aquarium water or plants into water bodies.
* Desiccate plant material and/or dispose by securely sealing in plastic bags and placing in the trash for disposal.
* Learn to identify Curly-leaf Pondweed and report your findings to the Montana Department of Agriculture; Montana Fish, Wildlife and Parks; County Extension agent; or Weed Coordinator.

CHEMICAL CONTROL (adapted from Parkinson et al. 2016)
Diquat (Resard, Weedtrine-D), Endothall (Aquathol, Hydrothol 191), and Fluridone (Sonar A.S, Sonar SRP) have been used to herbicide plants in water bodies. The timing of chemical control, water temperature, and herbicide concentration, and other factors are critical to effectively hinder Curly-leaf Pondweed and reduce negative impacts to native vegetation – see Parkinson et al. 2016, and always follow chemical label instructions and use restrictions. These herbicides must be applied by applicators with an Aquatic Pest Control license. Consult your County Extension Agent and/or Weed District for more information on herbicidal control of Curly-leaf Pondweed. Curly-leaf Pondweed initiates growth prior to the native plants, which can help reduce negative impacts from herbicides on native vegetation. However water temperatures must still be appropriate for the herbicide to work on Curly-leaf Pondweed.

MECHNICAL CONTROL (adapted from Parkinson et al. 2016)
Raking and hand-cutting can be effective for controlling smaller populations of Curly-leaf Pondweed. All plant material should be bagged and desiccated before placing in the trash for disposal. Raking and hand-cutting should be done in spring to early summer to prevent the formation of turions, which will disrupt its life cycle. These methods need to be repeated for many years, and monitored thereafter to ensure the plant does not re-establish. See Parkinson et al. 2016 for further details.

PHYSICAL CONTROL (adapted from Parkinson et al. 2016)
Benthic barriers are mats that are laid down on the floor of the water body around docks and other high-use areas. They prevent light from penetrating and prevent plants from rooting. They are usually effective, but kill all vegetation and are long-lasting.
Drawdowns that lower the water levels in the fall can be effective, but requires extensive planning and permitting, and can hurt non-targeted vegetation and animal life.
Dredging excavates the floor of the water body. This deepens the water body to prevent light penetration. This control can be effective, but requires extensive planning and permitting, and can hurt non-targeted vegetation and animal life.

BIOLOGICAL CONTROL (adapted from Parkinson et al. 2016)
Grass carp have been used in portions of the United States to control Curly-leaf Pondweed. However, these fish feed on other aquatic plants and destroy habitat. They are not legally allowed in Montana.

CULTURAL CONTROL (adapted from Parkinson et al. 2010)
To avoid accidentally introducing non-native plants to surrounding water bodies, never place your water-garden near or allow water to overflow into wetlands, streams, rivers, lakes, or ponds. Non-native water-garden plants should never be dumped into natural water bodies. Before purchasing plants, verify that the plant is not invasive.

Contact information for Aquatic Invasive Species personnel:

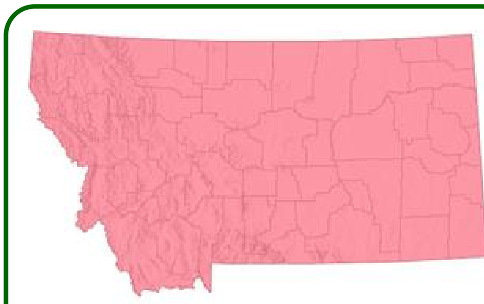
Montana Fish, Wildlife, and Parks Aquatic Invasive Species staff
Montana Department of Natural Resources and Conservation's Aquatic Invasive Species Grant Program
Montana Invasive Species Council (MISC)
Upper Columbia Conservation Commission (UC3)

Common St. John's-wort
Hypericum perforatum

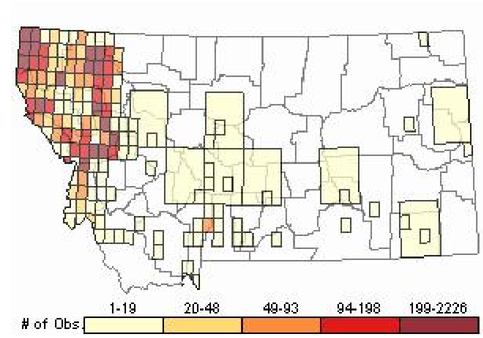
View in Field Guide

Noxious Weed: Priority 2B
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0



Range Non-native



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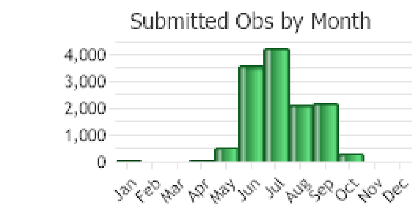


General Description

PLANTS: Multi-stemmed, herbaceous perennial that has a taproot and is rhizomatous. Stems grow from 25 to 75 cm tall. Flowering stems are smooth, reddish, and upright with two opposite longitudinal ridges and black glands. Stems are somewhat woody at the base and branched near their tops. From the root crown also grow leafy non-flowering stems. Sources: Piper *in* Sheley and Petroff 1999; Lesica et al. 2012.

LEAVES: Leaves are sessile and arranged opposite. Leaf blades are dark green above, light green below, lanceolate in shape, 1–3 cm long, and dotted with translucent glands. Hold leaves to the light or use a hand-lens to see the translucent glands. Leaf margins have black glands, are smooth (entire), and revolute. Sources: Piper *in* Sheley and Petroff 1999; Lesica et al. 2012.

INFLORESCENCE: Yellow flowers are arranged in an open, flat-topped cyme. Each flower has 5 green sepals that are linear-lanceolate in shape and 5–8 mm long. Each flower has 5 golden-yellow petals, 8–14 mm long, and edged with black glands. Stamens are numerous and noticeable. Sources: Piper *in* Sheley and Petroff 1999; Lesica et al. 2012.

The specific epithet of *perforatum* refers to the translucent glands that appear to put holes in the leaf.

Phenology

Plants emerge in spring and may re-grow in fall with enough soil moisture. Flowering occurs June through September. Seeds develop from mid-summer to late fall. Source: Piper *in* Sheley and Petroff 1999.

Diagnostic Characteristics

Montana has 3 native and 1 exotic species of *Hypericum*. All have leaves that are opposite, sessile, entire, and dotted with translucent glands. Hold a leaf up to the sunlight and see the glands.

Common St. John's-wort - *Hypericum perforatum*, exotic and noxious
Distinguished by:
* Size: Mature plants are 25-75 cm tall.
* Flowers: 5-yellow petals outlined by black glands and showy yellow stamens.
* Sepal: 5 linear-lanceolate with acute tips.
* Branches: reddish-colored that help make the plant more noticeable in fall.
* Fruit: a 3-valved capsules with many, tiny seeds.
* Roots: taprooted and rhizomatous.

Tinker's-penny - *Hypericum anagalloides*, native and desirable
* Mature plants are 2-12 cm tall, grow along the ground, and root at leaf nodes.
* Smaller flowers with 5-yellow petals not outlined by black glands and slightly longer than sepals.
* Habitat of wetlands and wet soil in meadows along streams in montane and subalpine zones.

Larger Canadian St. John's-wort - *Hypericum majus*, native and desirable
* Mature plants are 5-25 cm tall, grow decumbant.
* Smaller flowers with 5-yellow petals not outlined by black glands and about as long as sepals.
* Habitat along rivers, ponds, and lakes in valley and montane zones.

Western St. John's-wort – *Hypericum scouleri*, native and desirable
* Mature plants are 5-60 cm tall.
* Large flowers with 5-yellow petals outlined by black glands.
* Sepals are ovate with rounded tips and amber veins.
* Rhizomatous and stoloniferous.
* Habitat is moist to wet areas in meadows, along streambanks, and on ledges from the valleys to the alpine zones.

Habitat

Common St. John's-wort grows in grasslands, open forest, clearings in forested areas, pastures, and along roadsides in valleys and montane zones in Montana (Lesica et al. 2012). Elsewhere it can be a problem in orchards and in fruit and conifer plantations (Piper *in* Sheley and Petroff 1999).

Management

Once plants become established Common St. John's-wort is very difficult to control or remove.

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al. *in* Sheley and Petroff 1999). Once identified an integrated weed management strategy that promotes a weed-resistant plant community and serves other land-use objectives such as livestock forage, wildlife habitat, or recreation can be developed.

PREVENTION [Adapted from Piper *in* Sheley and Petroff 1999]
Preventing the establishment of Common St. John's-wort can be accomplished by many practices:
* Learn how to accurately identify Common St. John's-wort in order to detect occurrences and know where to implement control methods.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.
* Do not pick the flowers or transport plants. Where possible, contribute to or develop educational campaigns to help eradicate or reduce Common St. John's-wort populations.

PHYSICAL and CULTURAL CONTROLS [Adapted from Piper *in* Sheley and Petroff 1999]
Hand-pulling is effective for young populations or isolated plants. Rhizomes that remain in the soil can sprout new plants. Populations with a seedbed or multiple ages will be difficult to control with only hand-pulling. Hand-pulling plants in combination with other control methods will likely be more successful at removing the population.

Repeated Tilling in intensively cropped situations is effective.

Revegetating land with competitive, locally adapted, and palatable grasses, legumes, or other desirable forbs will develop a plant community that is more resilient to Common St. John's-wort. A program in Australia found that cultivation, fertilization, and re-seeding with a competitive perennial grass controlled Common St. John's-wort over a 2 to 5 year time period. Plants do poorly in shaded environments. Sites that are re-forested can reduce populations, but will not completely eradicate plants. Revegetation in combination with other control methods can be more effective to eradicate or reduce this plant.

Prescribed Burning is not an effective control method. Burning stimulates seed germination and re-growth from buds on the root crowns and rhizomes. Repeated burning diminishes decaying organic matter and deletes nutrients, creating conditions that favor its re-establishment.

Mowing is not an effective control method because established populations have multiple aged plants and flowering/seeding can occur in spring, summer, and/or fall. Mowing can reduce flowering and seed formation, but would need to be repeated during the growing season and in subsequent years. Mowing encourages the sprawling growth of stems from buds on the root crowns and rhizomes.

CHEMICAL CONTROLS [Adapted from Piper *in* Sheley and Petroff 1999]
Herbicides can be effective, especially when properly integrated with intensive pasture management. The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

2,4-D (2 pounds acid equivalent per acre (ae/ac)) applied to foliage will kill plants in the seedling and pre-flowering stages in non-cropland sites.

Picloram (0.125 to 1.50 pounds per active ingredient per acre (ae/ac)) or glyphosate (0.187 to 0.375 ae/ac applied in the spring can suppress plants in pastures, rangelands, and other non-cropland sites.

Mesulfuron (0.04 pounds ai/ac) applied after plant emergence can be an effective control.

BIOLOGICAL CONTROLS
The first attempt in North America to control an exotic plant by the intentional introduction of insects was done to control Common St. John's-wort in California in the 1940's (Piper *in* Sheley and Petroff 1999). Inspiration came from Australia where European insects were released into Australia in the 1940s and successfully suppressed Common St. John's-wort (Piper *in* Sheley and Petroff 1999).

St. John's-wort Beetle (*Chrysolina hypericin*) and Klamath Weed Beetle (*Chrysolina quadrigemina*) feed on foliage of Common St. John's-wort during their larval stage. This reduces the plant's ability to store nutrients in their roots, which can lessen winter survival (https://integratedweedcontrol.com). These insects have significantly reduced populations in the Pacific Northwest states (https://integratedweedcontrol.com). They are best suited to sunny and warm sites in mountainous areas (Mangold, Sheley, and Brown 2017). *Chrysolina hypericin* performs better where sites are wetter.

St. John's-wort Inchworm (*Aplocera plagiata*) was introduced into the Pacific Northwest. Larvae of this moth feed on leaves and flowers. When numerous enough the plants are defoliated, and flower and seed formation are inhibited (https://integratedweedcontrol.com). This insect lives best in dry, open areas with soils that are sandy, rocky, or of limestone parent material (Mangold, Sheley, and Brown 2017). Insects don't thrive where precipitation is high.

St. John's-wort Root Borer (*Agrilus hyperici*) lives best in dry, mountainous areas (Mangold, Sheley, and Brown 2017).

St. John's-wort Midge (*Zeuxidiplosis giardi*) prefers damp sites and does not do well in dry, wind-prone, or heavily grazed areas(Mangold, Sheley, and Brown 2017). Thus, it has not established well in Montana (Mangold, Sheley, and Brown 2017).

GRAZING CONTROLS
Common St. John's-wort is toxic to Common St. John's-wort is toxic to cattle, horses, sheep, and goats [see Threats or Limiting Factors] (Piper *in* Sheley and Petroff 1999; Mangold, Sheley, and Brown 2017). However, grazing management that maintains the viability of dense, desirable forage will be more resilient to invasion by Common St. John's-wort.

Contact information for local county Weed District Coordinators can be found on the Montana Weed Control Association Contacts Webpage.

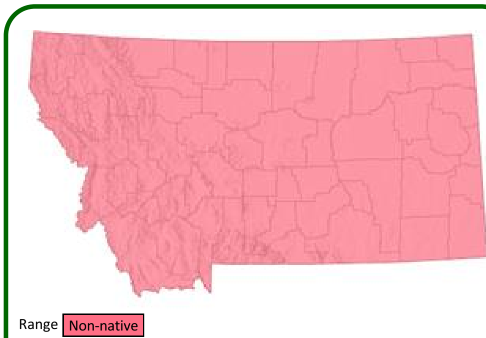
Useful Links:
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Integrated Noxious Weed Management after Wildfires

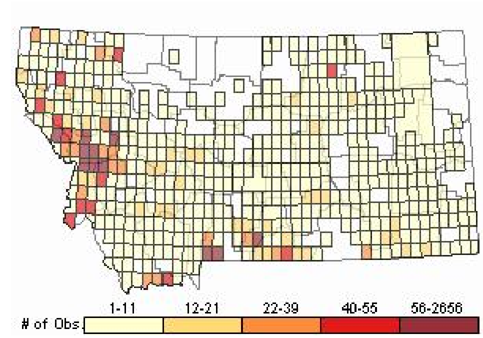
Cheatgrass
Bromus tectorum

View in Field Guide

Regulated Weed: Priority 3
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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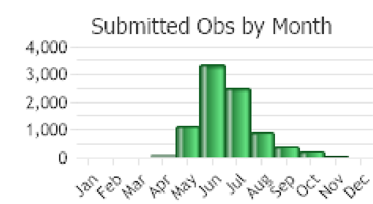


General Description

PLANTS: An annual bunchgrass. Stems are erect, slender, and grow from 20–50 cm tall, depending upon soil moisture and plant density. Plants are green, but upon maturity turn red-brown. Stems are sparsely hairy (puberulent) below the inflorescence. Sources: Barkworth *in* Flora of North America (FNA) 2007; Lesica et al. 2012.

LEAVES: Blades are 2–4 mm wide, up to 16cm long, and are softly hair on both sides. Sheaths are often densely and softly retrorsely pubescent to pilose, though sometimes the upper sheaths are glabrous. Ligules are membranous. Sources: Barkworth *in* FNA 2007; Lesica et al. 2012.

INFLORESCENCE: An open, often nodding panicle of 2–15 cm long. Spikelets are 10–17 mm long with 3 to 6 florets. At maturity spikelets are red-brown to purple. Lemmas are 9–12 mm long, gradually tapered into two narrow teeth. The awn is straight or twisted, 12–20 mm long, and attached to the lemma. Sources: Barkworth *in* FNA 2007; Lesica et al. 2012.

The common name "Downy Brome" refers to the numerous, fine hairs on its leaves.
The common name "Cheatgrass" comes from pioneering farmers who noticed it reduced their wheat yields, and in feeling cheated named it "cheatgrass".

See video on Identifying Invasive Annual Grasses in Montana.

Phenology

Cheatgrass is a winter annual (see REPRODUCTIVE CHARACTERISTICS section).

Diagnostic Characteristics

Montana has 7 species of annual Bromes (*Bromus*), and only 3 are described below. A technical manual is recommended, such as Manual of Montana Vascular Plants (Lesica et al. 2012).

Cheatgrass – *Bromus tectorum*, exotic, undesirable, and State-Regulated
* Seedlings have very hairy blades and sheaths.
* Awns are reddish-purple at maturity and easily stick to clothing and fur, and can get into the nostrils and eyes of animals.
* Glumes and lemmas are usually hairy. 1st Glume is 1-veined.
* Lemmas taper into 2 narrow teeth: bodies are 9-12 mm long and awns are greater than 10 mm.

Ripgut Brome - *Bromus diandrus*, exotic and undesirable
* Lemmas taper into 2 narrow teeth: bodies are 20-35 mm long and awns are greater than 10 mm.
* 1st Glume is 1-veined.

Japanese Brome – *Bromus japonica*, exotic and undesirable
* Plants tend to grow in more moist sites than does Cheatgrass (but can co-occur).
* Awns are straight or curved outward, less than 10 mm long.
* Glumes and awns not usually hairy
* 1st Glume is 3-to 5-veined.
* Spikelets often several from branch ends.

Habitat

Cheatgrass grows on overgrazed rangelands, fields, roadsides, waste places, sagebrush steppe, and open, dry understory (Lesica et al. 2012).

Management

Wherever Cheatgrass establishes it will be persistent, and eradication is not a reasonable goal in most situations. The strategy chosen to suppress Cheatgrass will determine its level of abundance and role in the community. Sites need to be evaluated to determine how much of the community still has perennial shrubs, forbs, and grasses. In sites devoid of perennial plants, the Cheatgrass community is likely stable and self-perpetuating and control techniques do not need to consider impacts to perennial plants. In sites with seral plant communities that have Cheatgrass, but also have perennial shrubs, forbs, and/or grasses, control techniques that do not harm the perennial vegetation should be implemented.

An integrated vegetative management approach provides the best long-term control, and requires that land-use objectives and a desired plant community be identified (Shelly et al.*in* Sheley and Petroff 1999). Once identified an integrated weed management strategy to promote a weed-resistant plant community and serve other land-use objectives such as livestock forage, wildlife habitat, or recreation, can be developed.

PREVENTION [Adapted from Sheley and Petroff 1999]
Preventing the establishment of Cheatgrass can be accomplished by many practices:
* Learn how to accurately identify Cheatgrass in order to detect occurrences and know where to implement control methods.
* Implement measures to reduce soil disturbance and improve conditions for perennial plant reproduction.
* Prevent vehicles from driving through and animals from grazing within infested areas.
* Thoroughly wash the undercarriage of vehicles and wheels in a designated area before moving to uninfested areas.
* Frequently monitor for new plants, and when found implement effective control methods.
* Maintain proper grazing management that creates resilience to noxious weed invasion.

PHYSICAL and CULTURAL CONTROLS [Adapted from Mosley *in* Sheley and Petroff 1999]
Hand-pulling is effective and easy in small areas, gardens, alleys, and other places, particularly when soils are moist. The shallow, fibrous roots system makes it easier for the entire plant to be pulled and bagged. If plants are in the fruit/seed stage then plants should be allowed to desiccate within sealed bags before depositing in the landfill. Hand-pulling should be done at intervals until the seed source is depleted.

Disking creates favorable soil conditions, stimulates seed germination, and is usually not effective. To be effective, tillage must be 10-15 cm deep in order to bury seeds and prevent their germination and be repeated during the season. Increasing the soil bulk density of the soil will inhibit Cheatgrass, but should not be done if it will impact desirable plants.

Revegetating land with competitive, locally adapted, and competitive grasses, forbs, and shrubs will develop a plant community that is more resilient to Cheatgrass. However, establishing the community can be difficult because cheatgrass plants quickly absorb available soil moisture and nutrients. It is necessary to use revegetation in combination with disking, herbicides, or prescribed fire on rangeland to be more effective in reducing Cheatgrass. Details at combining techniques can be found in Mosley *in* Sheley and Petroff 1999 and with your local County Weed or Farm agents.
NOTE: Cultivars of native grasses do not break down and degrade like true native plants, and will contribute to fuel loads and harming biological soil crusts.

Prescribed Burning is not an effective control method. Burning will decrease above ground biomass, but stimulates seed germination, and decreases competition from desirable plants. Cheatgrass plants that establish after a fire produce more seed per plant.

Mowing is not an effective control method because it distributes seeds, decreases competition from adjacent plants, and maintains conditions that are favorable to Cheatgrass.

CHEMICAL CONTROLS [Adapted from Mosley *in* Sheley and Petroff 1999]
Herbicides can be effective, when desired perennial plants are still abundant in the community. A single year of herbicide application will temporarily reduce the population, but increase seed production. Chemical control must be repeated for 2 to 5 consecutive years. Combining revegetation with herbicide control can be more effective if done properly. Details at combining techniques can be found in Mosley *in* Sheley and Petroff 1999.

The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

Paraquat (0.5 pounds active ingredient (ai) per acre) applied in the spring to the vegetative stage or early dough stage of seed development will provide control if repeated for 2 consecutive years. A surfactant will increase the effectiveness of paraquat.

Glyphosate (0.6 pounds ai per acre) applied in the spring will kill desirable perennial grasses. For Cheatgrass glyphosate (0.5 pounds ai per acre) applied in the spring to the vegetative stage or early dough stage of seed development will provide control if repeated for 3 consecutive years. For Cheatgrass glyphosate (0.4 pounds ai per acre) applied in the spring to the early dough stage of seed development will provide control if repeated for 3 consecutive years.

BIOLOGICAL CONTROLS [Adapted from Mosley *in* Sheley and Petroff 1999]
No biological control agents are available. Cheatgrass seedheads are susceptible to Ergot, a fungus which will kill seeds.

GRAZING CONTROLS [Adapted from Mosley *in* Sheley and Petroff 1999]
Livestock grazing can be purposely designed to control Cheatgrass (Megee 1938; Daubenmire 1940; Valentine and Stevens 1994; and Mosely 1996). As a tool it works best when targeted to local areas for the purpose of protecting existing perennial plants from fire or aiding seeding restoration in severely depleted sites.

To control Cheatgrass targeted grazing must be done at least twice per season for at least two consecutive years. The grazing intensity should be light enough to maintain a minimum 8 cm (3 inches) stubble height on desirable grasses. The first grazing should be done in the spring when plants are tall enough to become accessible and palatable, but before plants turn purplish (before they reach the soft dough stage of seed development). This will prevent most seed development. The second grazing should occur in late spring during the boot stage, then allowed to re-grow for 3-4 weeks before re-grazing.

Grazing intensities in winter can be moderate to heavy without damaging perennial plants, as long as soils are dry and firm.

Prescribed grazing can also reduce litter build-up, disrupting the fire cycle, reducing the fuel loads, and enhance the competitiveness from perennial plants. Grazed firelines should be at least 75 meters (250 feet) wide.

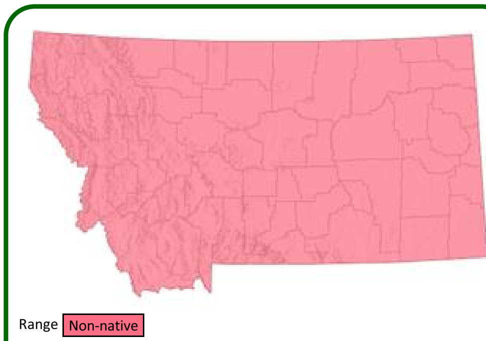
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

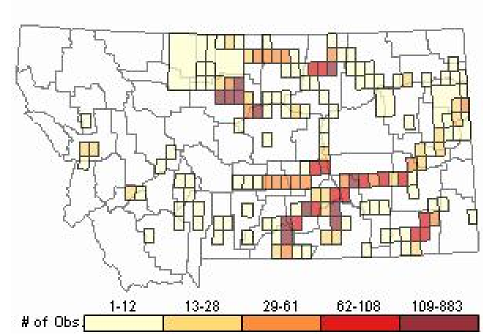
Russian Olive
Elaeagnus angustifolia

View in Field Guide

Regulated Weed: Priority 3
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank:
C-value: 0





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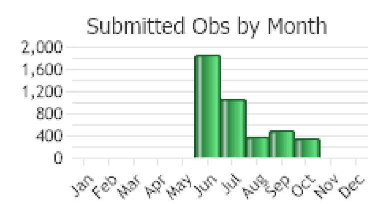


General Description

PLANTS: Large shrubs or small trees that grow to 8 meters tall. Stems are thorny with a color and texture that is silvery-mealy becoming orange-brown. Source: Lesica et al. 2012

LEAVES: Alternately arranged. Blades are narrowly lanceolate with smooth (entire) margins, white-mealy, silvery beneath, and 3–10 cm long. Petioles are short. Source: Lesica et al. 2012

INFLORESCENCE: 1-4 stemmed (pedicillate) flowers grow in leaf axils or on short first-year twigs. Flowers have 4-sepals that are silvery on the outside and yellow within, and no petals. Sepals are 2-4mm long. The sepals and stamens form a tube (hypanthium) that surrounds but does not attach to the superior ovary (perigynous). The tube is 5–6 mm long, silvery. The fruit is olive-like, becoming green. Source: Lesica et al. 2012

Phenology

Fruits mature in late summer.

Diagnostic Characteristics

Russian Olive – *Elaeagnus angustifolia*, exotic, undesirable, and Regulated:
* Tall shrubs or small trees with twigs that have white-mealy hairs (trichomes), becomeing orange-brown.
* Leaves are alternately arranged, narrowly lanceolate, white-mealy above, and silvery below.
* Twigs have thorns.
* Fruits are silvery-green and dry (olive-like).

American Silverberry – *Elaeagnus commutata*, native and desirable:
* Shrubs with twigs that have white-mealy hairs (trichomes), becoming gray.
* Leaves are alternately arranged, ovate to elliptic, white-mealy above, and silvery below.
* Twigs lack thorns.
* Fruits are silvery-green and dry (olive-like).

Silver Buffaloberry - *Shepherdia argentea*, native and desirable:
* Shrubs with twigs that have white-mealy hairs (trichomes), becoming gray.
* Leaves are oppositely arranged, oblanceolate, and white-mealy below.
* Twigs have thorns.
* Fruits are orange to red, juicy berries.

Canada Buffaloberry - *Shepherdia canadensis*, native and desirable:
* Shrubs with twigs that have brown-mealy hairs (trichomes), becoming gray.
* Leaves are oppositely arranged, narrowly ovate, and brown-mealy below.
* Twigs lack thorns.

* Fruits are orange to red, juicy berries.

Habitat

In Montana Russian Olive grows in woodlands, thickets, riparian forests, and moist meadows around wetlands in the plains and valleys (Lesica et al. 2012). Plants grow in soils with low to moderate soluble salt concentrations, and are somewhat tolerant of saline soil (Lesica and Miles 2001; Lesica et al. 2012).

Management

Russian Olive will likely continue to increase along Montana's rivers because it is immune to beavers, is shade-tolerant, and can colonize a variety of moist habitats in the floodplains along our regulated and free-flowing floodplains. It may likely replace cottonwood trees along rivers where overbank alluvial deposition provides the only establishment for cottonwood seedlings (Lesica and Miles 2001). Russian Olive will tend to become dominant in reaches where the riparian zone is less dynamic and the stream is entrenched or channelized (Lesica and Miles 2001). Eradicating mature Russian Olive trees every 10 years or all trees every 30 years could be an effective strategy to control is populations and affects on native wildlife and plants (Lesica and Miles 2001).

PREVENTION
To avoid the development of new infestations Russian Olive should not be planted near to riparian areas, overflow areas, or irrigation ditches (Lesica and Miles 2001).

PHYSICAL and CULTURAL CONTROLS
Revegetation: Russian Olive is invasive, despite that it has a history of being used in restoration and other improvement-type land projects. There are many alternative species that should be used in conservation plantings and readers should consult Species Alternatives for Russian Olive in Conservation Plantings (Tober et al. 2006).

CHEMICAL CONTROLS [Adapted from Piper *in* Sheley and Petroff 1999]
The herbicide type and concentration, application time and method, environmental constraints, land use practices, local regulations, and other factors will determine its effectiveness and impact to non-target species. Strict adherence to application requirements defined on the herbicide label will reduce risks to human and environmental health. Consult your County Extension Agent and/or Weed District for information on herbicidal control. Chemical information is also available at Greenbook.

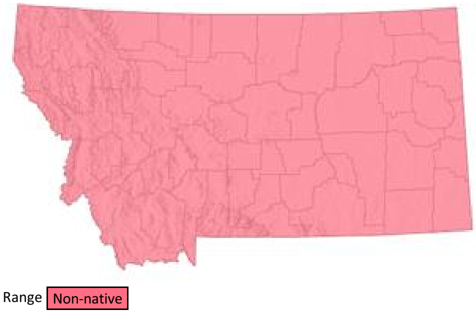
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

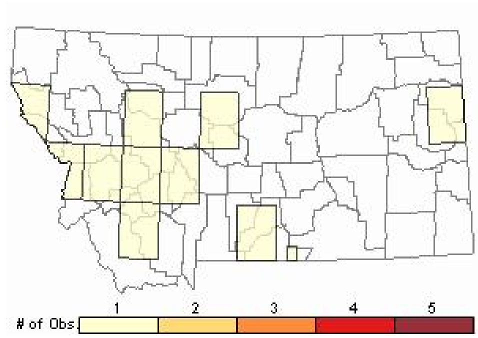
Red-headed Leafy Spurge Stem Borer
Oberea erythrocephala

View in Field Guide

Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:





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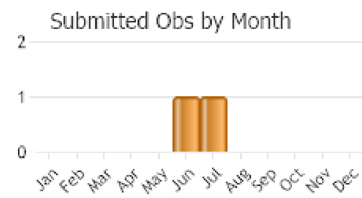

General Description

[From Schroeder 1980:238-239] Subgenus *Amaurostoma*: eyes smaller, not bordering base of mandible; mandibles long and slender with protrusions at base; labrum mat without long hairs on front border; elytra on base of epipleura without colored markings.

O. erythrocephala: Length 6.0-14.0 mm, width 1.5-3.0 mm; very slender; antennae a little shorter than body (male) or much shorter (female), the 3rd segment longer than the 4th, much longer than the scape. Lower lobes of eyes as long as gena; front 1.5X the width of one lobe (male) or almost 2X as wide (female). Head and pronotum densely punctate; pronotum transverse, scutellum large and triangular. Elytra very long (3X head length and pronotum combined), parallel and somewhat cut at ends, densely and grossly punctate, the points partly in lines, rather faint towards ends of the elytra. Lateral parts densely punctate. Hind femora slightly extending over posterior border of first abdominal segment. Hind tibia 2/3 longer than hind tarsae. Body red in color with yellowish pubescence. Antennae black with a dark brown pubescence. Tips of mandibles, anterior and posterior borders of pronotum, scutellum, elytra, and sterna all black with grayish pubescence. Mesepisternum and metaepisternum covered with dense brownish-yellow pubescence. First 3 abdominal segments with a large central black band (reduced in width from 1st to 3rd segment); part of 5th segment blackish.

Phenology

Adults active from late May (males emerge several days before females) to early August in Austria, Germany, Italy, Switzerland, overwinter as larvae in host plant and continue to feed the following spring (Schroeder 1980); similar phenology in North American populations, although may require 2 years to complete life cycle in northern part of range (Schroeder 1980; Rees et al. 1996; Hansen et al. 1997).

Diagnostic Characteristics

Smaller eye size, the elytra on base of epipleura without colored markings, and longer more slender mandibles distiguishes members of the subgenus *Amaurostoma* (of which *Oberea erythrocephala* is a member) from members of the Old World subgenus *Oberea*. Features described in General Description (see above) and host plant specificity (*Euphorbia* rather than woody trees and shrubs) should help distinguish this species from native North American members of the genus in Montana (see Hart et al. 2013 for a list of *Oberea* species).

Habitat

Uncultivated fields, pastures, rangelands, and cultivated croplands where Leafy Spurge (*Euphorbia esula*) and related *Euphorbia* species present; established best in riparian areas with some tree cover (Schroeder 1980; Rees et al. 1986; Rees et al. 1996; Hansen et al. 1997; Lajeunesse et al. 1997).

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods (Lajeunesse et al. 1997; Lym 2005). This approach applies to use of *Oberea erythrocephala* for controling leafy spurge. Although this biocontrol agent has potential to greatly depress leafy spurge populations, it attacks only specific biotypes of spurge, which inhibits beetle population growth sufficiently in many areas to greatly reduce its effectiviness. Adult feeding on host leaves and stems does not greatly affect leafy spurge survival. However, girdling and subsequent egg-laying by adult females results in shoot death. Larval feeding in stem pith causes stem death, and larval feeding in root crown and roots greatly reduces the plant's root reserves. Larvae live and feed in host plants with stem diameters >3.0 mm (Rees et al. 1996).

The following general suggestions (from Lajeunesse et al. 1997) may help insure successful collection and establishment of biocontrol insects:

1) Determine beforehand the habitat requirements for biocontrol insects to be used. Avoid sites with high ant and grasshopper populations, and seek areas free from grazing, herbicide or pesticide use. Initial release sites should be protected for up to 10 years, secondary sites need less protected time.
2) Collection should be made with minimum stress to the insects. Beetles can be collected by using a sweep net through the upper portions of leafy spurge plants 8-10 times, then dumping content into a container.
3) Release insects as quickly as possible. If moved more than 80 km or held for more than a few hours, the biocontrol species should be sorted out from other species of arthropods captured during sweeping. Biocontrol insects should be kept cool during transport through use of a cooler with refrigerated (not frozen) coolant packs.
4) Release biocontrol insects during the cool parts of a day by sprinkling over a small area (10-15 square meters) on a leafy spurge infestation of moderate density. Avoid tall, dense stands that may provide too much shade and high humidity.
5) Permits are required to transport biocontrol insects across state or provincial borders; in Montana, permits can be obtained from the Montana Department of Agriculture.

Specifically to *Oberea erythrocephala*, adult beetles are the life stage to transfer and introduce. Adults can be obtained by sweep-netting or hand-collecting at sites with established beetle populations. These can be stored for up to several weeks if kept cool and then allowed to warm up three times per week for two-hour periods to exercise and feed. They can be shipped in a cool environment with plant stems and leaves for food. However, release should occur within six days once shipped (Rees et al. 1996). They should be released directly on the leafy spurge plants (Lajeunesse et al. 1997)

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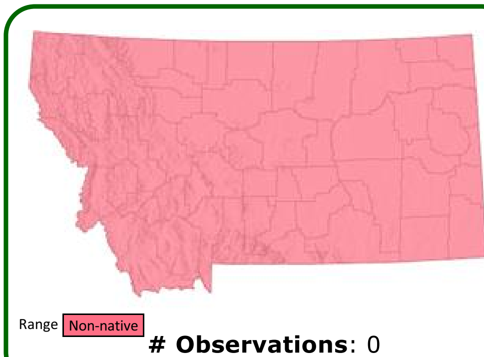
Brown-legged Leafy Spurge Flea Beetle
Aphthona lacertosa

View in Field Guide

Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:



 # Observations: 0

General Description

Genus *Aphthona*: Front carinate, frontal tubercles well developed and clearly marginated, antennae longer than half the body length, prothorax broader than long, pronotum lacking both longitudinal and transverse grooves, elytra wider at base than pronotum, elytral punctation confused or (sometimes) in irregular rows, procoxal cavities open, tibial spurs simple and inserted at outer corner of tibia, first hind tarsi usually distinctly shorter than 1/2 length of hind tibia. Male with first segment of front tarsus enlarged (not enlarged in female), posterior margin of last visible abdominal sternite distinctly lobate (evenly rounded in female), males smaller and more slender on average than females; female antennae proportionally shorter (LeSage and Paquin 1996).

Aphthona lacertosa: adults about 3.0-4.0 mm in body length; dorsal and ventral body surfaces black with strong blue metallic reflections (occasionally dark green); hind femora partly brown, tibia yellowish with small dark area on dorsal surface; tip of male aedeagus nipple-shaped; female receptacle ovoid, dorsal surface of recepticle convex; female styli elongate, 10X as long as wide (Gassmann et al. 1996; LeSage and Paquin 1996; Rees et al. 1996).

Phenology

Adults emerge late May through July, eggs throughout mid-June to August, larvae fall to spring of following year, pupae late spring to early summer (Gassmann et al. 1996; Rees et al. 1996; Lajeunesse et al. 1997; Skinner et al. 2004, 2006; Lym 2005; Joshi 2008).

Diagnostic Characteristics

See General Description (above) for distinguishing *Aphthona* from other beetles. *A. lacertosa* differs from *A. nigriscutis* externally by having an overall black appearance (except the legs) with metallic blue to dark green reflections of the body instead of being brown with a contrasting black dot behind the thorax at the leading edge of the wings.

Habitat

Uncultivated fields, pastures, rangelands, and disturbed sites (such as railroad right-of-ways) where Leafy Spurge (*Euphorbia esula*) and related *Euphorbia* species present, particularly slightly moist to wet sites with loamy soils and well-developed herbaceous vegetation; possibly sites with clay soils but not very dry sites with sandy soils or those prone to flooding (Gassmann et al. 1996; Rees et al. 1996; Lajeunesse et al. 1997; Lym and Nelson 2000); in western North Dakota, beetle densities highest in shrub and grassland habitats, lowest in woodland and river bottom habitats (Larson and Grace 2004).

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods, such as herbicides, grazing, fire, and reseeding (Lajeunesse et al. 1997; Lym 2005; Joshi 2008). *Aphthona lacertosa* does not appear to shift feeding preference to native North American (non-target) *Euphorbia* when given opportunity to do so (Wacker and Butler 2006).

The following general suggestions (from Lajeunesse et al. 1997) may help insure successful collection and establishment of biocontrol insects:

1) Determine beforehand the habitat requirements for biocontrol insects to be used. Avoid sites with high ant and grasshopper populations, and seek areas free from grazing, herbicide or pesticide use. Initial release sites should be protected for up to 10 years, secondary sites need less protected time.
2) Collection should be made with minimum stress to the insects. Beetles can be collected by using a sweep net through the upper portions of leafy spurge plants 8-10 times, then dumping content into a container.
3) Release insects as quickly as possible. If moved more than 80 km or held for more than a few hours, the biocontrol species should be sorted out from other species of arthropods captured during sweeping. Biocontrol insects should be kept cool during transport through use of a cooler with refrigerated (not frozen) coolant packs.
4) Release biocontrol insects during the cool parts of a day by sprinkling over a small area (10-15 square meters) on a leafy spurge infestation of moderate density. Avoid tall, dense stands that may provide too much shade and high humidity.
5) Permits are required to transport biocontrol insects across state or provincial borders; in Montana, permits can be obtained from the Montana Department of Agriculture.

Specifically to *Aphthona lacertosa*, adult beetles are the life stage to transfer and introduce. Adults can be obtained by sweep-netting at sites with established beetle populations. These can be stored for several days in cardboard containers with leafy spurge leaves if kept cool, and exercised and fed periodically under warmer conditions. Overwintering larvae can be dug from frozen host plant roots and soil material, and kept frozen until several weeks before adults are desired, at which time samples are removed from cold storage and allowed to warm to ambient or room temperature, thereby permiting larvae to develop and become adults. Adults should be sprinkled directly on leafy spurge plants (Rees et al. 1996; Lajeunesse et al. 1997)

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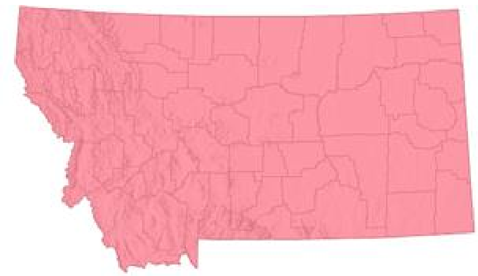
Weed Publications at Montana State University Extension - MontGuides

Black Dot Leafy Spurge Flea Beetle
Aphthona nigriscutis

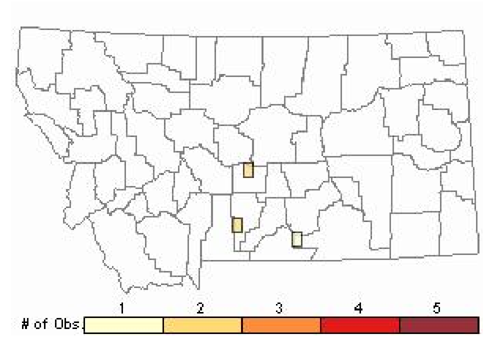
View in Field Guide

Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:



Range Non-native



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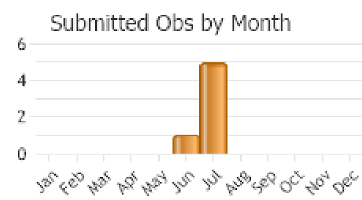

General Description

Genus *Aphthona*: Front carinate, frontal tubercles well developed and clearly marginated, antennae longer than half the body length, prothorax broader than long, pronotum lacking both longitudinal and transverse grooves, elytra wider at base than pronotum, elytral punctation confused or (sometimes) in irregular rows, procoxal cavities open, tibial spurs simple and inserted at outer corner of tibia, first hind tarsi usually distinctly shorter than 1/2 length of hind tibia. Male with first segment of front tarsus enlarged (not enlarged in female), posterior margin of last visible abdominal sternite distinctly lobate (evenly rounded in female), males smaller and more slender on average than females; female antennae proportionally shorter (LeSage and Paquin 1996).

Aphthona nigriscutis: adults 3.0-3.5 mm in body length; dorsal and ventral body surfaces brown or brownish; scutellum dark brown, contrasting with paler color of pronotum and elytra; hind femora yellowish; tip of male aedeagus nipple-shaped; female spermathecae declivous portion of spermathecal duct bent at obtuse angle from longitudinal axis of recepticle viewpoint, dorsal surface of recepticle concave; female styli with pair of short setae at apex, dark brown markings usually sharply contrasting over pale areas of styli (LeSage and Paquin 1996; Rees et al. 1996).

Phenology

Adults June to August, eggs June to August, larvae July to May of following year, pupae early spring to May (Rees et al. 1996; Jackson 1997; Lajeunesse et al. 1997; Skinner et al. 2006).

Diagnostic Characteristics

See General Description (above) for distinguishing *Aphthona* from other beetles. *A. nigriscutis* differs from *A. lacertosa* externally by being brown with a contrasting black dot behind the thorax at the leading edge of the wings instead of having an overall black appearance (except the legs) with metallic blue to dark green reflections of the body.

Habitat

Uncultivated fields, pastures, rangelands, and disturbed sites (such as railroad right-of-ways) where Leafy Spurge (*Euphorbia esula*) and related *Euphorbia* species present, particularly in dry open habitats on hilltops with well-drained and coarse sandy soils (Gassmann et al. 1996; Rees et al. 1996; Lajeunesse et al. 1997; Lym and Nelson 2000); beetle densities highest in shrub and grassland habitats, lowest in woodland and river bottom habitats in western North Dakota (Larson and Grace 2004). For xeric sites in eastern Montana with annual precipitation of 280-380 mm, beetle densities greatest in sites with high annual precipitation; beetle density not related to sand content of soils nor total stem density of leafy spurge, but was positively related to density of flowering leafy spurge stems and distance from beetle release points (Jacobs et al. 2001).

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods, such as herbicides, grazing, fire, and reseeding (Lajeunesse et al. 1997; Lym 2005). When using fire, beetles are more succesful when released on plots in habitats already suitable for beetles and burned prior to their release, possibly because fire reduces accumulated litter and further bares the soil (Fellows and Newton 1999). *Aphthona nicriscutis* does not appear to shift feeding preference to native North American (non-target) *Euphorbia* when given opportunity to do so (Wacker and Butler 2006).

The following general suggestions (from Lajeunesse et al. 1997) may help insure successful collection and establishment of biocontrol insects:

1) Determine beforehand the habitat requirements for biocontrol insects to be used. Avoid sites with high ant and grasshopper populations, and seek areas free from grazing, herbicide or pesticide use. Initial release sites should be protected for up to 10 years, secondary sites need less protected time.
2) Collection should be made with minimum stress to the insects. Beetles can be collected by using a sweep net through the upper portions of leafy spurge plants 8-10 times, then dumping content into a container.
3) Release insects as quickly as possible. If moved more than 80 km or held for more than a few hours, the biocontrol species should be sorted out from other species of arthropods captured during sweeping. Biocontrol insects should be kept cool during transport through use of a cooler with refrigerated (not frozen) coolant packs.
4) Release biocontrol insects during the cool parts of a day by sprinkling over a small area (10-15 square meters) on a leafy spurge infestation of moderate density. Avoid tall, dense stands that may provide too much shade and high humidity.
5) Permits are required to transport biocontrol insects across state or provincial borders; in Montana, permits can be obtained from the Montana Department of Agriculture.

Specifically to *Aphthona nigriscutis*, adult beetles are the life stage to transfer and introduce. Adults can be obtained by sweep-netting at sites with established beetle populations. These can be stored for several days in cardboard containers with leafy spurge leaves if kept cool, and exercised and fed periodically under warmer conditions. Overwintering larvae can be dug from frozen host plant roots and soil material, and kept frozen until several weeks before adults are desired, at which time samples are removed from cold storage and allowed to warm to ambient or room temperature, thereby permiting larvae to develop and become adults. Adults should be sprinkled directly on leafy spurge plants (Rees et al. 1996; Lajeunesse et al. 1997)

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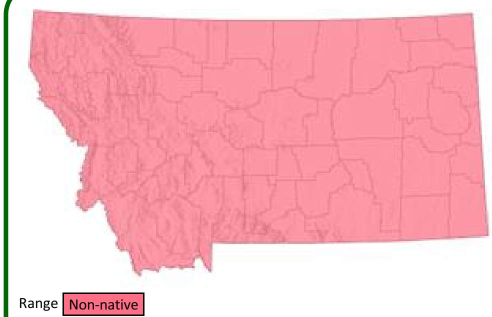
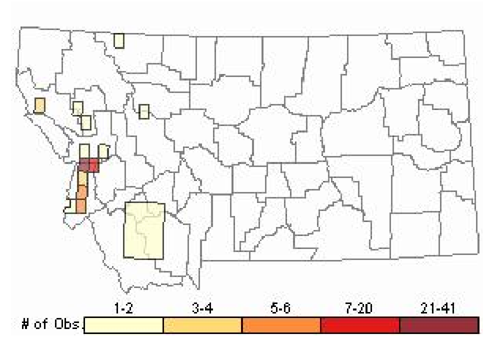
Knapweed Root Weevil
Cyphocleonus achates

View in Field Guide

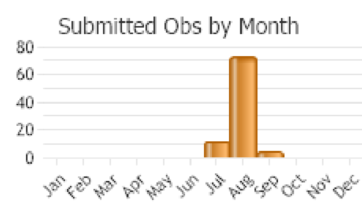
Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 91



General Description

[From Stinson et al. 1994; Wilson and Randall 2005; Goodman et al. 2006] Adults large, 13-15 mm in length (excluding snout; to 19 mm with snout), 3.0-5.5 mm in width; snout short and thick; flightless (elytra immobile); dorsum mottled gray and brown or gray and black. Sexes similar, reliably differentiated by abdominal shape: female abdomen caudally tapered (pointed) with cloacal opening facing outward, male abdomen with terminal segments deflexed ventrally causing cloacal opening to face ventrally; last two tergites of male sclerotized, only terminal tergite sclerotized in female. Mature larvae C-shaped with brown head capsule, about 13 mm in length, found in root galls.

Phenology

Univoltine (one generation per year). Phenology similar for wild and captive populations. Adults mid-July to mid-September, oviposition early August to September and early October (mid-November in captivity in Europe), larvae early August to the following mid-July (Stinson et al. 1994; Wikeem et al. 1999; Wilson and Randall 2005). In western Montana, adults active mid-July to October (Story et al. 2006; Corn et al. 2009).

Diagnostic Characteristics

Probably best determined from other weevil species by a combination of color, size, and host plant limitation (i.e., restricted to knapweeds).

Habitat

Early seral habitats, including disturbed hillsides, grazed hills, recently fallow land, roadsides, railroad right-of-ways, wherever released on stands of *Centaurea maculosa* and *C. diffusa* (Stinson et al. 1994; Wikeem et al. 1999;

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods (Wilson and Randall 2005; Duncan et al. 2011). With Spotted Knapweed (*Centaurea maculata*), and Diffuse Knapweed (*Centaurea difusa*) thirteen introduced insect species attack various parts of the host plant (including flowers, seed capsules, foliage, stems, and roots).

The following general suggestions (from Wilson and Randall 2005) may help insure successful collection and establishment of biocontrol insects for knapweeds:

1) Determine efficacy (ability to control the target weed), host plant specificity, and biocontrol availability for the biocontrol insects to be used.
2) Select release sites based on their desired function. Field nursery sites (for future biocontrol collection and redistribution) should exceed 2 acres with fairly continuous distribution of knapweed (with at least 3 knapweed plants per square yard), be safe from disturbance for 3-5 years, and accessible for regular monitoring. Sites for long-term monitoring should be buffered from other weed management programs and disturbance (grazing). Sites not intended for monitoring or biocontrol collection should be sufficiently large and free from disturbance to provide the agents the best possible chance to survive and flourish.
3) Agents should be stored and transported in sturdy containers that are kept shaded, cool, and well ventilated. An example is a pint-sized, nonwaxed, paperboard carton. Paper bags can work as temporary containers, so long as they do not get wet or squashed; avoid plastic bags, glass or metal containers. Prepare containers for agents by adding paper toweling to absorb moisture and povide insects as crawling surface. Do not add water. Transport containers in a large cooler with pre-frozen icepacks.

Specifically to *Cyphocleonus achates*, adults the life stage to release. Adults can be obtained at sites with established populations by hand picking from flowering plants or sweep netting, then transferred to containers; sweeping reported to be unproductive relative to hand picking (Story et al. 1997). The knapweed root weevil can also be mass-reared in field corrals (Story et al. 1996; Story and White 2010) or year-round in captivity (Goodman et al. 2006). At least 200 adult beetles are recommended for initial release of stem-boring weevils, although successful establishment can occur with fewer adults (Clark et al. 2001). Collect adults that are actively feeding and mating on top portions of plants. Transport and release beetles as soon as possible (preferably within 48 hours). Release should occur in good weather (warm, calm, cloudless) in early morning or cooler evening hours (avoid rain and very hot conditions) during peak emergence (typically August). Release on the ground at base of stems in dense stands of young host plants.

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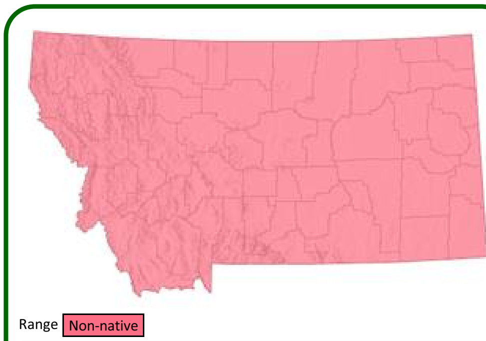
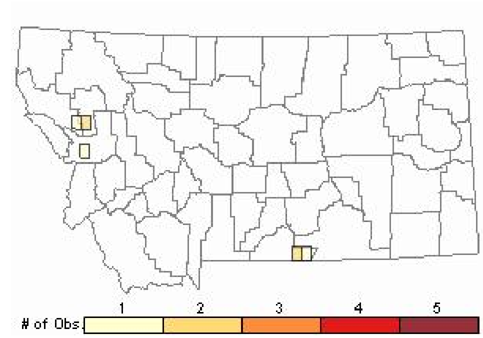
Dalmatian Toadflax Stem-boring Weevil
Mecinus janthiniformis

View in Field Guide

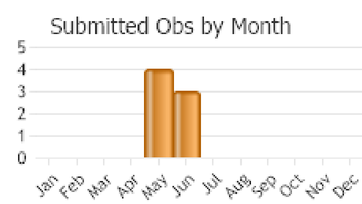
Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 7



General Description

Following many North American introductions of what was thought to be a single species, *Mecinus janthinus*, for use as a biocontrol agent against exotic toadflax (*Linaria* spp.), *Mecinus janthiniformis* is now recognized as a distinct cryptic species of *M. janthinus* (Tosevski et al. 2011). Because of the early failure to recognize the two species, some of what follows in the species account may pertain to both species.

[From Carney et al. 2004; Schat et al. 2007; Tosevski et al. 2011] Length 3.1-6.0 mm (rostrum excluded); mean length of males 4.1 mm (range 3.2-6.0 mm), females 4.1 mm (range 3.3-6.0 mm). Integument black except pronotum and elytra dark blue with metallic reflections. Rostrum in lateral view moderately and regularly curved, moderately long in male (about 0.80-0.88X as long as pronotum length), somewhat longer and apical portion more strongly curved in female (about 1.03-1.09X as long as pronotum length); rostrum moderately striate-punctured with numerous stout setae to apex (male) or striate-puntured with stout setae only in basal half then almost smooth (female). Pronotum sculpture formed by deep and small punctures more densely apressed, intervals between punctures narrow, smooth and shiny, clearly visible between sparse seta-like long white scales, widest at basal third. Elytra very long, about 2X as long as wide, with interstriae roughly sculptured and covered with recumbent seta-like white scales almost completely arranged in two rows (not a single median row). Profemora with distinct sharp tooth in male, unarmed in female. Aedeagus with sides slightly more abruptly narrowed in subapical part (not gradually narrowing in distal third), toward apex ending in form of subtruncate tip.

Phenology

In Eurasia, adults overwinter in host plant stems, emerge early April, egg-laying early May to mid-July (Tosevski et al. 2011). In North America, adults active early April to mid-August (overwinter other months), eggs early May to early July, larvae mid-May to mid-August, pupae mid-June to mid-September (Jeanneret and Schroeder 1992; Wilson et al. 2005; McClay and Hughes 2007).

Diagnostic Characteristics

Probably best differentiated from closely-related species by host plant specificity, larger body size (length), apical portion of female rostrum in lateral view more curved, punctures on pronotum slightly smaller and more densely adpressed, scales of elytral interstriae denser and arranged in two rows on parts of several interstriae (not one median row), aedeagus with sides more abruptly narrowed (not parallel) and ending in form of subtruncate tip (not subacute tip).

Habitat

Arid forest, montane meadows and pastures, rangeland supporting large-stemmed toadflaxes (*Linaria*) (Wilson et al. 2005; Tosevski et al. 2011).

Management

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods. With Dalmatian Toadflax (*Linaria dalmatica*), eight introduced insect species attack various parts or stages of the host plant (including flowers, seed capsules, foliage, and roots). *Mecinus janthiniformis*, a stem-boring agent, does not appear to shift feeding preference to most native North American (non-target) *Linaria* and related Scrophulariaceae species when given opportunity to do so (Sing et al. 2005). However, given the potential to develop on non-target native host plants, some of which are rare species in some states, additional testing under multiple-choice conditions and postrelease monitoring is required to determine host ranges of this biocontrol beetle (Hinz et al. 2014).

The following general suggestions (from Wilson et al. 2005) may help insure successful collection and establishment of biocontrol insects for toadflax:

1) Determine beforehand the efficacy (ability to control the target weed), host plant specificity, and biocontrol availability for the biocontrol insects to be used.
2) Select release sites based on their desired function. Field nursery sites (for future biocontrol collection and redistribution) should exceed 10 acres with fairly continuous distribution of toadflax, be safe from disturbance, and be accessible for regular monitoring. Sites for long-term monitoring should be buffered from other weed management programs and disturbance (grazing) for up to 10 years. Sites not intended for monitoring or biocontrol collection should be sufficiently large and free from disturbance to provide the agents the best possible chance to survive and flourish.
3) Agents should be stored and transported in sturdy containers that are kept shaded, cool, and well ventilated. An example is a pint-sized, nonwaxed, paperboard carton. Plastic containers can work with large holes cut in lid and protected with mesh screening. Avoid glass or metal containers. Prepare containers for agents by adding cut leafy stem pieces of toadflax for food, shelter, moisture. Do not add water. Transport containers in a large cooler with pre-frozen icepacks.

Specifically to *Mecinus janthiniformis*, adult beetles are the life stage to transfer and introduce. Adults can be obtained at sites with established beetle populations by tapping plants over tubs (tray sampling) to dislodge beetles, or sweep netting, then aspirated and transferred to containers. At least 200 adult beetles are recommended for initial release of stem-boring weevils, which can be collected in 30 minutes or less if the source population is appropriately large to support redistribution collections. Collect adults that are actively feeding and mating on top portions of plants. Transport and release agents as soon as possible (preferably within 24 hours). Release should occur in good weather in cooler early morning or evening hours. Release on the ground at the base of stems in a dense stand of young host plants in full sunlight.

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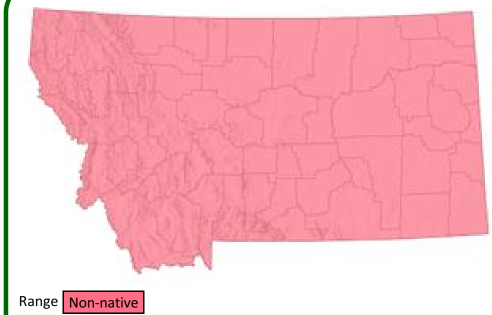
Useful Links:
Montana Invasive Species website
Montana Biological Weed Control Coordination Project
Montana Department of Agriculture - Noxious Weeds
Montana Weed Control Association
Montana Weed Control Association Contacts Webpage.
Montana Fish, Wildlife, and Parks - Noxious Weeds
Montana State University Integrated Pest Management Extension
Weed Publications at Montana State University Extension - MontGuides

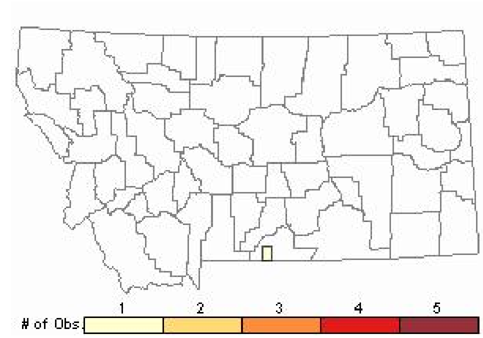
Yellow Toadflax Stem-boring Weevil
Mecinus janthinus

View in Field Guide

Biocontrol Species
Non-native Species
Global Rank: GNR
State Rank: SNA

Agency Status
USFWS:
USFS:
BLM:





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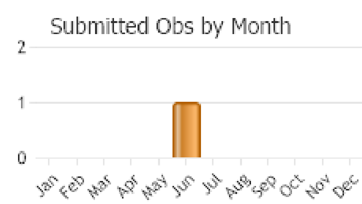

General Description

The original *Mecinus janthinus* is now recognized to have included a cryptic sister species, *M. janthiniformis* (Tosevski et al. 2011). This recognition followed many North American introductions of what was thought to be a single species of *Mecinus* for use as a biocontrol agent against exotic toadflax (*Linaria* spp.). Because of the early failure to recognize the two species, some of what follows in this species account may pertain to both species.

[From Carney et al. 2004; Wilson et al. 2005; Schat et al. 2007; Tosevski et al. 2011] Length 2.3-4.0 mm (rostrum excluded); mean length of males 3.3 mm, females 3.6 mm. Integument black except pronotum and elytra dark blue with metallic reflections. Rostrum in lateral view moderately and regularly curved, moderately long in male (0.80-0.88X as long as pronotum length), somewhat longer in female (1.03-1.09X as long as pronotum length); rostrum moderately striate-punctured with numerous stout setae to apex (male) or striate-puntured with stout setae only in basal half then almost smooth (female). Pronotum sculpture formed by deep punctures regular in shape and size, intervals between punctures narrow, smooth and shiny, clearly visible between sparse seta-like long white scales, widest at basal third. Elytra very long, about 2X as long as wide, with interstriae roughly sculptured and covered with recumbent seta-like white scales almost completely arranged in a single median row. Profemora with distinct sharp tooth in male, unarmed in female. Aedeagus with sides parallel, gradually narrowing in distal third, toward apex ending in form of subacute tip.

Phenology

In Eurasia, adults overwinter in stems and emerge early March, egg-laying late March to mid-June (Tosevski et al. 2011). In North America, adults active early April to mid-August (overwinter other months), eggs early May to early July, larvae mid-May to mid-August, pupae mid-June to mid-September (Jeanneret and Schroeder 1992; Wilson et al. 2005; McClay and Hughes 2007).

Diagnostic Characteristics

Probably best differentiated from closely-related species by host plant specificity, smaller body size (length), apical portion of female rostrum in lateral view less curved, punctures on pronotum slightly larger and less densely adpressed, scales of elytral interstriae less dense and arranged in one median row (not two), aedeagus with sides parallel (not abruptly narrowed) and ending in form of subacute tip (not subtruncate tip).

Habitat

Arid forest, lowland pasture, and rangeland supporting large-stemmed toadflaxes (*Linaria*) (Wilson et al. 2005; Tosevski et al. 2011).

Management

Biological control agents are most effective when integrated with other biocontrol and traditional methods. With Yellow Toadflax (*Linaria vulgaris*), eight introduced insect species attack various parts or stages of the host plant (including flowers, seed capsules, foliage, and roots). *Mecinus janthinus*, a stem-boring agent, does not appear to shift feeding preference to most native North American (non-target) *Linaria* and related Scrophulariaceae species when given opportunity to do so (Sing et al. 2005). However, given the potential to develop on non-target native host plants, some of which are rare species in some states, additional testing under multiple-choice conditions and postrelease monitoring is required to determine host ranges of this biocontrol beetle (Hinz et al. 2014).

The following general suggestions (from Wilson et al. 2005) may help insure successful collection and establishment of biocontrol insects for toadflax:

1) Determine beforehand the efficacy (ability to control the target weed), host plant specificity, and biocontrol availability for the biocontrol insects to be used.
2) Select release sites based on their desired function. Field nursery sites (for future biocontrol collection and redistribution) should exceed 10 acres with fairly continuous distribution of toadflax, be safe from disturbance, and be accessible for regular monitoring. Sites for long-term monitoring should be buffered from other weed management programs and disturbance (grazing) for up to 10 years. Sites not intended for monitoring or biocontrol collection should be sufficiently large and free from disturbance to provide the agents the best possible chance to survive and flourish.
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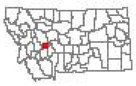
MONTANA
Natural Heritage Program

1515 East 6th Avenue
Helena, MT 59620
(406) 444-5363
mtnhp.org

Species Occurrences
from Environmental Summary



Latitude	Longitude
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Summarized by: 010N003W035 (Buffered PLSS Section)

Suggested Citation: Montana Natural Heritage Program. Environmental Summary Report. Custom Field Guide. Summarized by: 010N003W035 (Buffered PLSS Section). Retrieved on 6/23/2022.

Offline Field Guide

Note: This PDF version of the Montana Field Guide is intended to assist in offline identification and field work. It is not intended to replace the online Field Guide, as that version contains more information and is updated daily. For the most up-to-date information on Montana species, please visit **FieldGuide.mt.gov**

The Montana Natural Heritage Program is part of the Montana State Library's Natural Resource Information System. Since 1985, it has served as a neutral and non-regulatory provider of easily accessible information on Montana's species and biological communities to inform all stakeholders in environmental review, permitting, and planning processes. The program is part of NatureServe, a network of over 80 similar programs in states, provinces, and nations throughout the Western Hemisphere, working to provide current and comprehensive distribution and status information on species and biological communities.

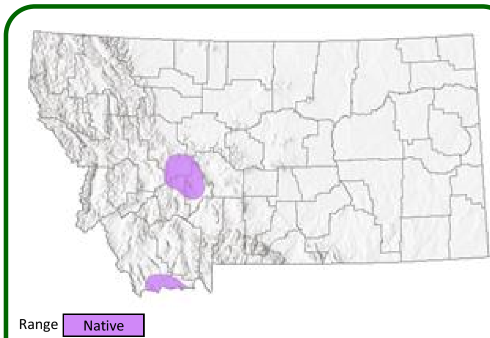
Montana Field Guide

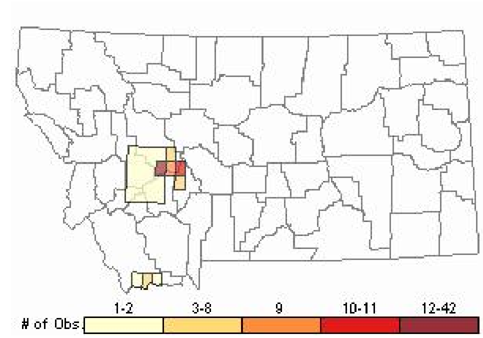
Lesser Rushy Milkvetch
Astragalus convallarius

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 2
C-value:





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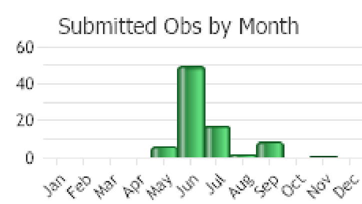


General Description

Lesser Rushy Milkvetch is a slender herbaceous perennial with 1-6 erect to spreading stems, rising up to 5 dm high from a branching, underground rootcrown. The compound or simple leaves are 2-11 cm long with 0-5 pairs of thread-like leaflets. Leaflets of the upper leaves are usually lacking, giving them a grass-like appearance. Foliage is sparsely hairy to glabrous in the upper portion. Off-white or yellowish, pea-like flowers are sparsely scattered on stalks which are 2-14 cm long and arise from the axils of the upper leaves. The upper petal of each flower is 7-11 mm long and bent upward. The calyx is 4-6 mm long and sparsely covered with white or black hairs. Pendent, green or purple-mottled fruits are bean-shaped, 13-50 mm long, and 2-4 mm wide.

Phenology

Flowering from June-early July, fruiting in late June-early August.

Diagnostic Characteristics

Only the typical variety of the species is known in the state. *A. ceramicus* looks similar in appearence but can be distinquished by the shorter calyx tube (2-3.5 mm long) and the inflated, oblong-ellipsoid pods, whereas the pods of *A. convallarius* are compressed and linear to oblong.

A. convallarius has sometimes been lumped with the species *A. diversifolius*.

Habitat

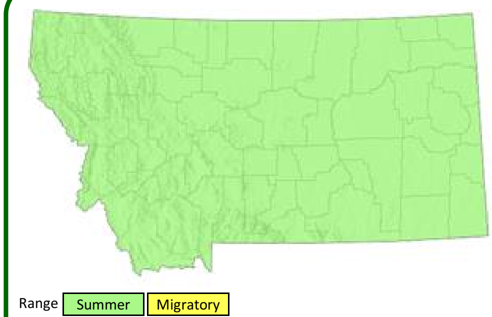
Grasslands and open ponderosa pine woodlands in the valley and foothills. *Festuca scabrella*, *Festuca idahoensis* and *Elymus spicatus* are common bunchgrass associates.

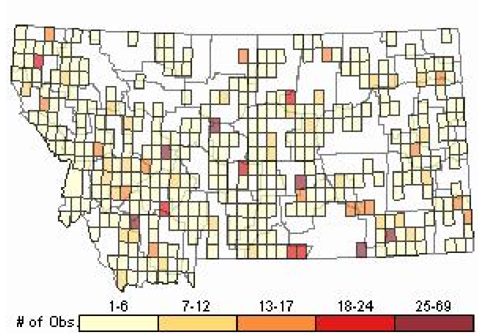
Hoary Bat
Lasiurus cinereus

View in Field Guide

Species of Concern
Native Species
Global Rank: G3G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3





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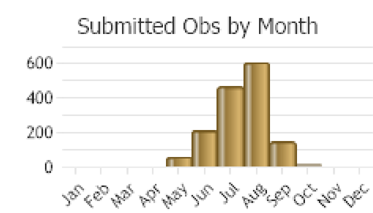


General Description

The Hoary Bat is a large lasurine (20 to 35 g) with long pointed wings and heavily-furred interfemoral membrane. Pelage overall is frosted or hoary (mixed brownish and grayish with white-tipped hairs, wrist and shoulder patches whitish), yellowish on the throat, forearm length about 46 to 55 mm. Ears are short and rounded, rimmed in dark brown or black, tragus short and broad. It has large teeth; dental formula I 1/3, C 1/1, P 2/2, M 3/3 (Shump and Shump 1982, Adams 2003).

Diagnostic Characteristics

Hoary Bat is the largest bat species found in Montana, and only one of two with an interfemoral membrane completely furred on the dorsal surface, the other being the Eastern Red Bat. The Hoary Bat has a distinctive appearance along with its large size (35 g in weight, to about 140 mm in total length): dorsal pelage in is a mixture of browns and grays, tinges with white, giving the bat a frosted or hoary appearance (Shump and Shump 1982), unlike the reddish dorsal pelage of the smaller Eastern Red Bat. Definitive Hoary Bat calls are also of lower characteristic frequency and appearance: < 23 kHz lasting up to 20 milliseconds for Hoary versus 38-50 kHz lasting > 10 milliseconds for Eastern Red.

Habitat

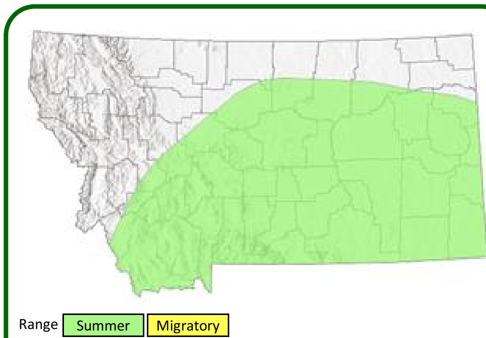
During the summer, Hoary Bats occupy forested areas. A female with two naked pups was found in mid-July using a wooden bridge in Stillwater County as a temporary day roost (Hendricks et al. 2005) but no other Montana roosts have been reported. Often captured foraging over water sources embedded within forested terrain, both conifer and hardwood, as well as along riparian corridors. Reported in Montana over a broad elevation range (579 to 2774 m; 1900 to 9100 ft) during August, the highest record from treeline along the Gravelly Range road (Madison County), the lowest from the Yellowstone River near Sidney (Richland County); probably most common throughout summer in Montana at lower elevations.

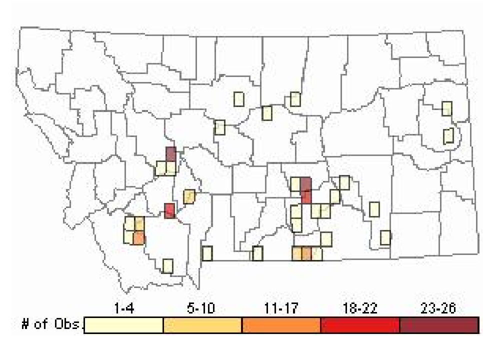
Spotted Bat
Euderma maculatum

View in Field Guide

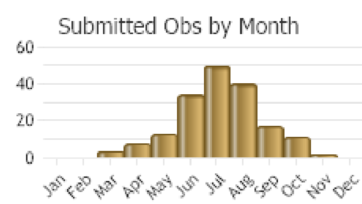
Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS: SENSITIVE
BLM: SENSITIVE
FWP SWAP: SGCN3, SGIN





 # Observations: 184



General Description

Spotted Bats have huge pink ears (37 to 50 millimeters long), the dorsum is blackish with a large white spot on each shoulder and on the rump, and white patches at the posterior base of each ear. Total length is 107 to 115 millimeters, forearm length is 48 to 51 millimeters, and weight is 16 to 20 grams. The greatest length of the skull is 18.4 to 19.0 millimeters (small sample). The supraorbital region of the skull is sharply ridged, but a median sagittal crest is absent; 34 teeth are present (Watkins 1977). The newborn young lack any indication of having the adult color pattern (Van Zyll de Jong 1985). Four hours after birth, a male weighed 4 grams and measured 59 millimeters in length; tail length was 20 millimeters, hind foot 11 millimeters, ear 12 millimeters, and forearm 21 millimeters.

Diagnostic Characteristics

Spotted Bats differ from other bats in Montana by the unique patterning of the fur and the extremely large ears. Their echolocation calls (an insect-like clicking) are audible to the unaided human ear.

Habitat

Spotted Bats have been encountered or detected most often in open arid habitats dominated by Utah juniper (*Juniperus osteosperma*) and sagebrush (*Artemisia tridentata* and *A. nova*), sometimes intermixed with limber pine or Douglas-fir, or in grassy meadows in ponderosa pine savannah (Fenton et al. 1987, Worthington 1991a, Hendricks and Carlson 2001). Cliffs, rocky outcrops, and water are other attributes of sites where Spotted Bats have been found (Foresman 2012), typical for the global range. Spotted Bats have been captured foraging over an isolated pond within a few kilometers of huge limestone escarpments in the Big Horn Canyon National Recreation Area, Carbon County (Worthington 1991a, 1991b), and the first record for the state was of an individual that flew in an open window at a private residence in Billings, Yellowstone County (Nicholson 1950). Roost habitats and sites have not been documented in Montana.

In other areas, Spotted Bats have been detected at water sources and in meadow openings, often with large cliffs nearby (Leonard and Fenton 1983, Storz 1995, Perry et al. 1997, Rabe et al. 1998, Gitzen et al. 2001).

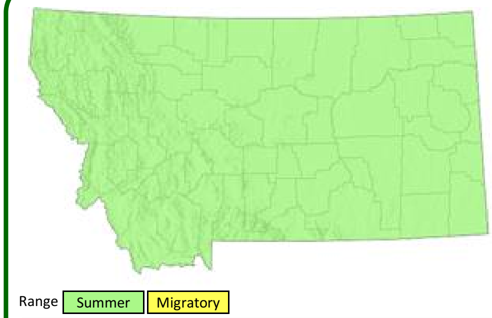
Spotted Bats roost in caves, and in cracks and crevices in cliffs and canyons, with which this species is consistently associated; it can crawl with ease on both horizontal and vertical surfaces (Snow 1974, Van Zyll de Jong 1985). In British Columbia, individuals used the same roost each night during May through July, but not after early August (Wai-Ping and Fenton 1989). Winter habitat is poorly documented. A possible explanation for the early paucity of collections in natural situations is the Spotted Bat's narrow habitat tolerance (Handley 1959, Snow 1974).

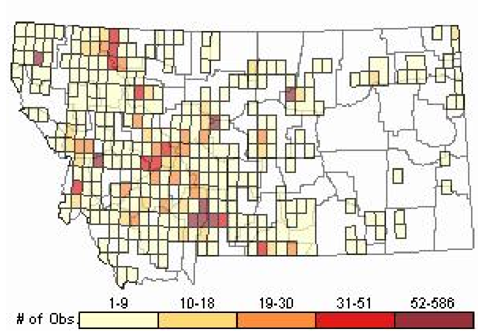
Veery
Catharus fuscescens

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





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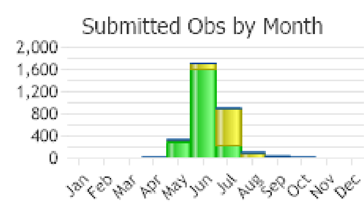


General Description

The Veery is an 18-cm-long bird with a reddish brown dorsum, white belly, gray flanks, grayish face, small spots (often indistinct) on the breast, indistinct grayish eyering, and straight slim bill. Western populations have a darker dorsum and more breast spotting than do eastern populations.

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

Veerys differ from other thrushes by having less breast spotting (less distinct and more restricted). They differ from Pacific coast populations of Swainson's Thrush (*Catharus ustulatus*) in having gray, instead of buffy brown, flanks.

Habitat

Generally inhabits damp, deciduous forests in the east. Has a strong preference for riparian habitats in several regions, including the Great Plains. Prefers disturbed forest, probably because denser understory is not found in undisturbed forests (Moskoff 1995). In Montana, Veerys are often associated with willow thickets and cottonwood along streams and lakes in valleys and lower mountain canyons (Saunders 1921, Hand 1969, Skaar 1969), icluding the Flathead and Lewistown regions (Silloway 1901, 1903a). It also occupies riparian cottonwood stands along the lower Missouri River (Kroodsma 1973). Along Beaver Creek in the Bears Paw Mountains, Veerys were present in a variety of plant community types (box elder, alder, aspen, cottonwood, and lodgepole pine) so long as willow was a significant component (Walcheck 1969).

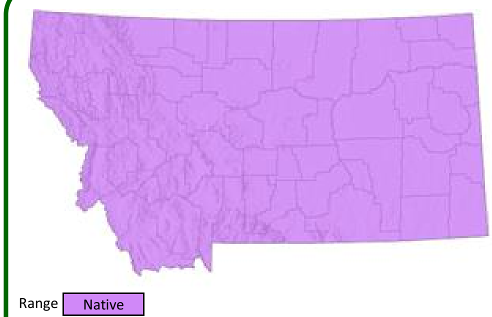
Suckley Cuckoo Bumble Bee

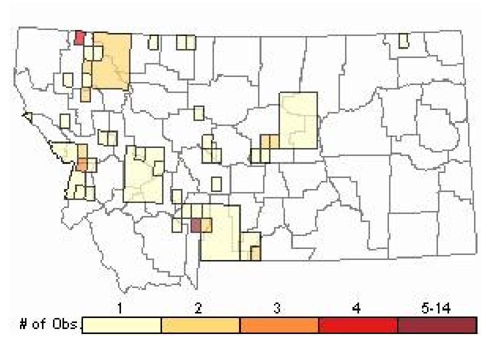
Bombus suckleyi

View in Field Guide

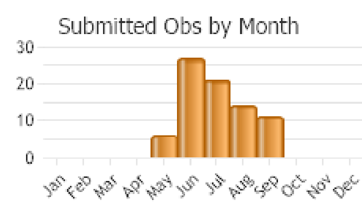
Species of Concern
Native Species
Global Rank: G2G3
State Rank: S1

Agency Status
USFWS:
USFS:
BLM:





 # Observations: 81



General Description

For definitions and diagrams of bumble bee morphology please see the Montana State Entomology Collection's Bumble Bee Morphology page. Medium sized and short-tongued: queens 18-23 mm (no workers). Outer surface of hind-leg tibia convex and densely hairy, lacks a pollen basket. Hair short and even, black on the face, predominantly yellow on sides of the thorax, black continuously along midline to anterior region of T4. Males 13-16 mm, hair color on sides of thorax yellow, T2 extensively yellow, T4 mostly yellow sometimes with narrow area of black hairs along midline, T7 black, antenna medium length, flagellum 3x longer than the scape (Williams et al. 2014).

Phenology

Queens reported April through August, males June through October (Koch et al. 2012, Williams et al 2014). In California, queens reported late May to late October, males early July to late September (Thorp et al. 1983).

Diagnostic Characteristics

Please see the Montana State Entomology Collection's Key to Female Bumble Bees in Montana. Outer surface of the hind tibia convex, densely hairy and lacking a pollen basket separates *B. suckleyi* from other *Bombus* except other cuckoo bumble bees. Predominantly black occiput separates *B. suckleyi* from other western cuckoo bumble bees, which have predominantly yellow hairs covering the occiput (Koch et al. 2012).

Habitat

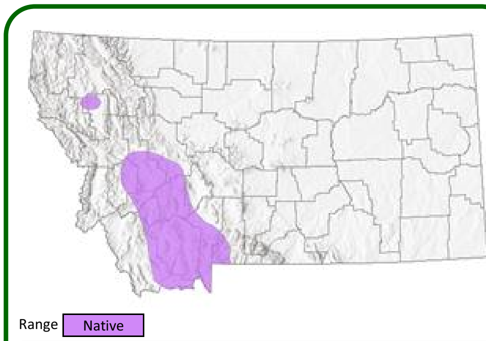
Reported in grassland and shrub-steppe along the Snake River Plain of southeastern Washington, and in conifer forest uplands nearby (Mayer et al. 2000). In the Lower Fraser Valley of British Columbia, they were not detected in commercial berry (*Vaccinium, Rhubus*) fields, instead preferring native vegetation, and found in greater numbers as distance from commercial operations increased (MacKenzie and Winston 1984). Present in montane to subalpine mesic and wet meadows in Colorado (Macior 1974).

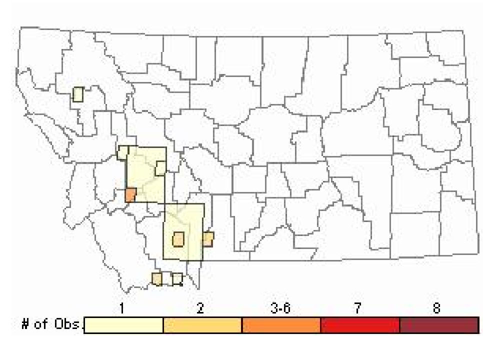
Wedge-leaf Saltbush
Atriplex truncata

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 4
C-value: 5





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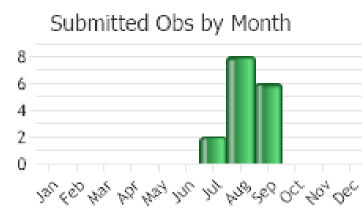


General Description

Wedge-leaved Saltbush is an annual with simple to branched stems that are 10-100 cm tall. The alternate, wedge-shaped to oval leaves, 15-40 mm long, have entire margins and short petioles. The foliage is sparsely to densely covered with grayish scales that rub off. Small, unisexual flowers are borne in clusters in leaf axils. Male flowers lack petals but have a 5-parted calyx. Female flowers lack both petals and sepals and are subtended by 2 wedge-shaped bracts which are 2-3 mm long in fruit and which have entire margins but 2-3 low teeth across the top.

Phenology

Flowering and fruiting in August-September.

Diagnostic Characteristics

A. truncata is similar to *A. argentea*, *A. powellii*, and *A. rosea*, but can be distinguished by the wedge-shaped flower bracts that are 3 mm long or less with smooth faces and a wavy or toothed upper margin.

Habitat

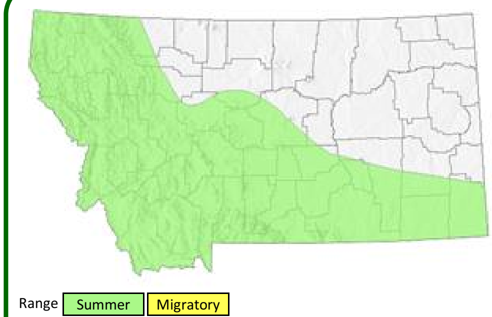
Vernally moist, alkaline soil around ponds and along streams in the valleys.

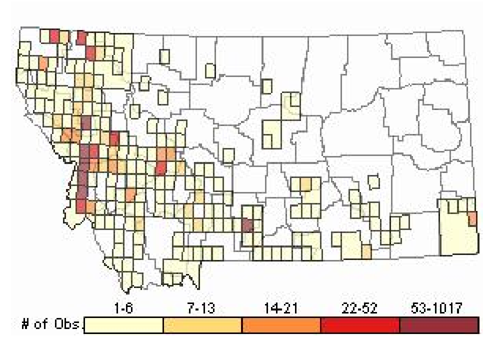
Lewis's Woodpecker
Melanerpes lewis

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S2B

Agency Status
USFWS: MBTA; BCC10; BCC17
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN2
PIF: 2





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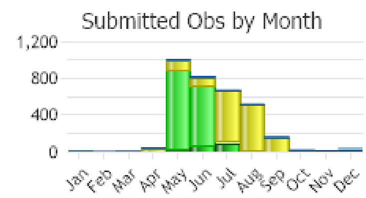


General Description

The Lewis's Woodpecker is a medium sized woodpecker, approximately 10 to 11 inches in length. They weigh about 115 grams. Their wings and tail are relatively long (Sibley 2000). The head, back, wings and tail are greenish-black. They have a silver-pale collar and upper breast. The face is dark red and the belly and lower breast is pinkish or salmon-red. The sexes are similar in appearance, but males are usually larger than females (Tobalske 1997). Juvenile birds are distinct from adults, having an overall dark appearance with more brownish-black on the back. They usually lack the silver color of the neck, the pinkish belly color, as well as the red on the face (Tobalske 1997).

Lewis's Woodpeckers are quieter than other woodpeckers. They commonly call during the breeding season only. During breeding male Lewis's Woodpeckers will give a harsh "*CHURR*" call which is repeated 3 to 8 times. Males will also give a chatter call throughout the year and commonly during the breeding season (Tobalske 1997).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

The plumage of the Lewis's Woodpecker will easily distinguish it from any other woodpecker species. Also the flight pattern is unique for woodpeckers. Lewis's Woodpecker flight is slow and direct and will often include long glides and aerial maneuvers (Tobalske 1997). From long distances, Lewis's Woodpeckers may be mistaken for a American Crow or jay, but closer observation of the plumage and form will eliminate any confusion.

Habitat

In the Bozeman area, Lewis's Woodpeckers are known to occur in river bottom woods and forest edge habitats (Skarr 1969). Habitat information from other Lewis's Woodpecker sources state that the breeding habitat is open forest and woodland, often logged or burned, including oak and coniferous forest; primarily ponderosa pine (*Pinus ponderosa*), riparian woodland and orchards, and less commonly in pinyon-juniper *Pinus* spp.-*Juniperus* spp.) (American Ornithologists' Union 1983). Lewis's Woodpecker distribution is closely associated with open ponderosa pine forest in western North America, and is strongly associated with fire-maintained old-growth ponderosa pine (Diem and Zeveloff 1980, Tobalske 1997, Saab and Dudley 1998).

Important habitat features include an open tree canopy, a brushy understory with ground cover, dead trees for nest cavities, dead or downed woody debris, perch sites, and abundant insects. Lewis's Woodpeckers use open ponderosa pine forests, open riparian woodlands dominated by cottonwood (*Populus* spp.), and logged or burned pine. They also use oak (*Quercus* spp.) woodlands, orchards, pinyon-juniper woodlands, other open coniferous forests, and agricultural lands. Apparently the species prefers open ponderosa pine at high elevations and open riparian forests at lower elevations (Bock 1970, Tobalske 1997). In the Blue Mountains of Oregon, they showed a preference for open stands near water (Thomas et al. 1979). Because the species catches insects from the air, perches near openings or in open canopy are important for foraging habitat (Bock 1970, Tobalske 1997).

Lewis's Woodpeckers often use burned pine forests, although suitability of post-fire habitats varies with the age, size, and intensity of the burn, density of remaining snags, and the geographic region. Birds may move to unburned stands once the young fledge (Block and Brennan 1987, Tobalske 1997, Saab and Dudley 1998). They have been generally considered a species of older burns rather than new ones, moving in several years post-fire once dead trees begin to fall and brush develops, five to thirty years after fire (Bock 1970, Block and Brennan 1987, Caton 1996, Linder and Anderson 1998). However, on a two- to four-year-old burn in Idaho they were the most common cavity-nester, and occurred in the highest nesting densities ever recorded for the species (Saab and Dudley 1998). As habitat suitability declines, however, numbers decline. For example, in Wyoming, the species was more common in a seven-year-old burn than in a twenty-year-old burn (Linder and Anderson 1998). Overall, suitable conditions include an open canopy, availability of nest cavities and perches, abundant arthropod prey, and a shrubby understory (Linder and Anderson 1998, Saab and Dudley 1998).

Unlike other woodpeckers, Lewis's Woodpeckers are not morphologically well adapted to excavate cavities in hard wood. They tend to nest in a natural cavity, abandoned Northern Flicker (*Colaptes auratus*) hole, or previously used cavity, 1 to 52 meters above ground. Sometimes they will excavate a new cavity in a soft snag (standing dead tree), dead branch of a living tree, or rotting utility pole (Harrison 1979, Tobalske 1997). The mated pair may return to the same nest site in successive years. On partially logged burns with high nesting densities in Idaho, nest sites were characterized by the presence of large, soft snags and an average of 62 snags per hectare that had more than 23-centimeter diameter at breast height (dbh) (Saab and Dudley 1998).

In late summer, wandering flocks move from valleys into mountains or from breeding habitat to orchards. In winter, they use oak woodlands and nut and fruit orchards. An important habitat feature in many wintering areas is the availability of storage sites for grains or mast, such as tree bark (e.g. bark of mature cottonwood trees) or power poles with desiccation cracks (Bock 1970, Tobalske 1997). In southwestern Arizona and southeastern California, Lewis's Woodpeckers may use scrub oak, pecan orchards, and cottonwoods, but more study is needed in this area (Bock 1970). In Mexico, they use open and semi-open woodlands, especially those with oaks (Howell and Webb 1995).

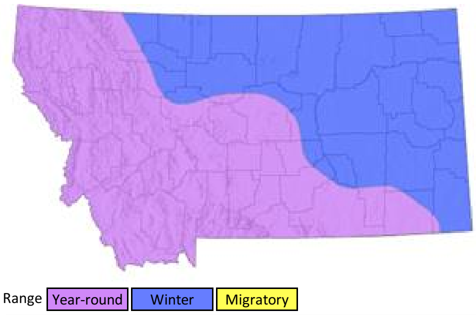
Evening Grosbeak

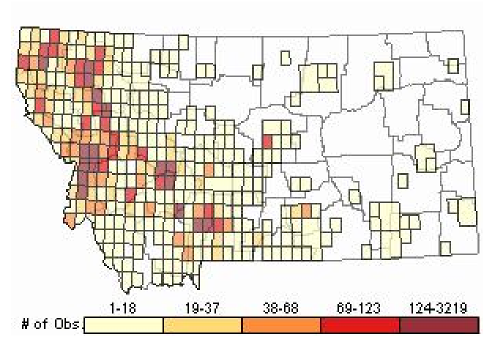
Coccothraustes vespertinus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA; BCC10
USFS:
BLM:
FWP SWAP: SGCN3
PIF:





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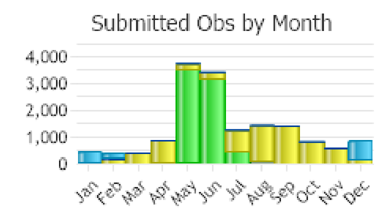


General Description

The Evening Grosbeak is a large, robust finch with a massive, conical bill. This species forms large, irruptive feeding flocks in winter, announcing its arrival with a loud "*clee-ip*" or "*peeer*" call. Although gregarious in winter, this species is secretive during the breeding season and little is known about its breeding biology (Gillihan and Byers 2001).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

Adults observed feeding young from late-May through August. Feeding flocks are irruptive and have been observed September-early May, with the largest flock size occurring during the winter months of December-February (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

A large, stocky finch with a heavy, greenish-yellow bill. Adult male has a brownish-black head with a black crown, and a yellow forehead and eyebrow. The neck and back are brown contrasting with yellow shoulders and rump. Tail and wings are black with large white patches. Throat is brown and underparts are brownish-yellow. Adult female is mostly grayish brown with a thin moustache and yellowish wash on the sides of the neck. Wings and tail are black with white spotting. Throat and underparts are pale grayish-brown. Juvenile resembles adult female (Gillihan and Byers 2001).

Habitat

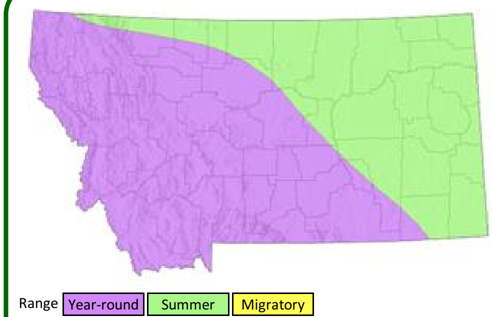
In Montana, the Evening Grosbeak breeds in mixed coniferous and spruce-fir forests of western Montana. Winter habitat is much more varied, including coniferous forest as well as urban and suburban areas statewide (Gillihan and Byers 2001, Montana Natural Heritage Program Point Observation Database 2014).

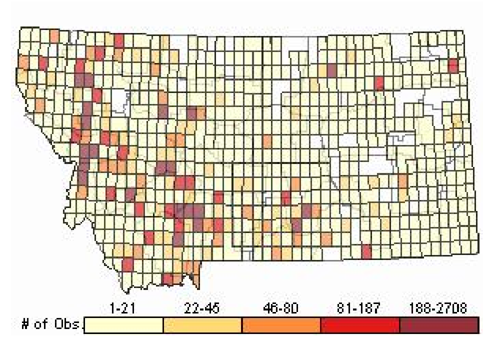
Great Blue Heron
Ardea herodias

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF:





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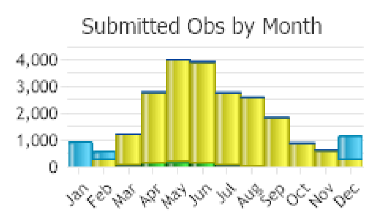


General Description

Largest heron in North America, 60 cm tall, 97 to 135 cm long, 2.1 to 2.5 kg mass. Wings long and rounded, bill long and tapered, tail short. Upper parts are gray, fore-neck is streaked with white, black, and rust-brown. Bill yellowish. Legs brownish or greenish. In flight, folds neck in an "S" shape and extends legs along the body axis; wing beats are deep slow wing. Adults have long occipital plumes (Butler 1992).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Diagnostic Characteristics

No other heron in Montana is the size or color of the Great Blue Heron, nor are other herons likely to be encountered in Montana during winter.

Habitat

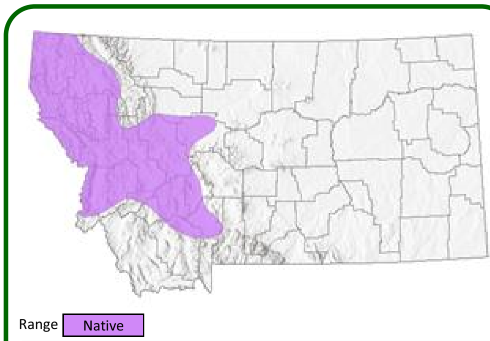
Great Blue Herons are equally at home in urban wetlands and wilderness settings. Most Montana nesting colonies are in cottonwoods along major rivers and lakes; a smaller number occur in riparian ponderosa pines and on islands in prairie wetlands. Nesting trees are the largest available. Active colonies are farther from rivers than inactive colonies. The number of nests in the colony corresponds to the distance from roads (Parker 1980). Great Blue Herons build bulky stick nests high in the trees when nesting near the shores of rivers and lakes and on the ground or in low shrubs when nesting on treeless islands.

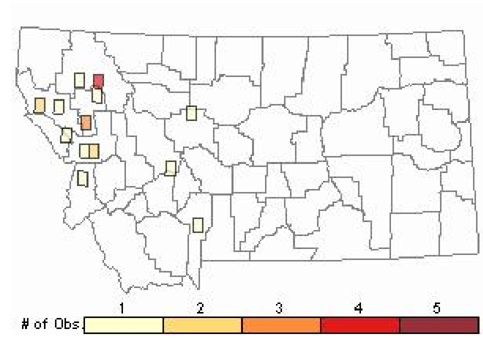
Pale-yellow Jewel-weed
Impatiens aurella

View in Field Guide

Species of Concern
Native Species
Global Rank: G4
State Rank: S3

Agency Status
USFWS:
USFS:
BLM:
MNPS Threat Rank: 3
C-value: 3





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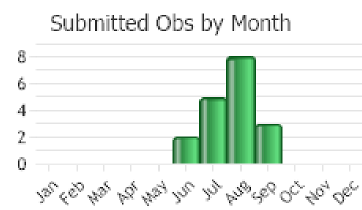


General Description

Stems erect, branched, 20–70 cm. Leaf blades 3–12 cm long; petioles 2–4 cm long. Flowers yellow, often with orange spots, 11–15 mm long; saccate sepal with a recurved spur 6–10 mm long. Capsule 1–2 cm long (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

Habitat

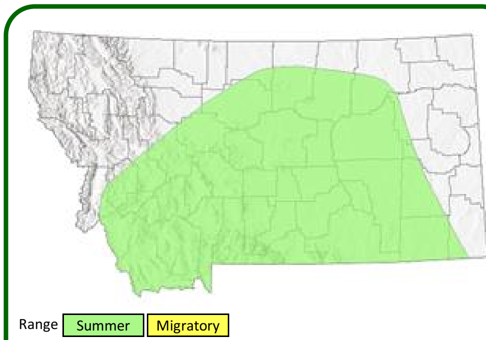
Wet, usually organic soil of marshes, ditches; valleys (Lesica et al. 2012. Manual of Montana Vascular Plants. BRIT Press. Fort Worth, TX).

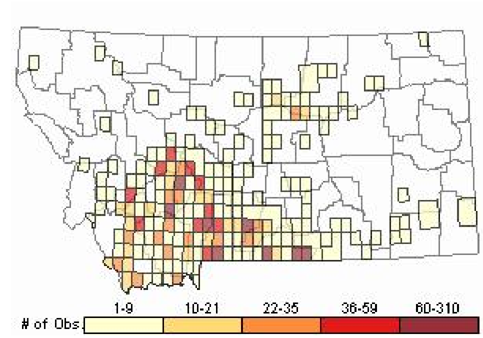
Green-tailed Towhee
Pipilo chlorurus

View in Field Guide

Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM:
FWP SWAP: SGCN3
PIF: 3





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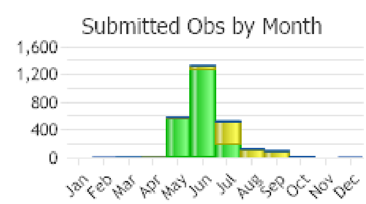


General Description

The Green-tailed Towhee is a large, secretive sparrow of shrub-steppe habitats, spending much of its time scratching the ground to move leaf litter in search of food. Its catlike "*mew*" calls and vigorous foraging method often reveal its presence. Males sing a song of jumbled notes and trills (Dobbs et al. 2012).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

Singing males observed in suitable habitat in May. Several records of nestlings and/or fledglings in June and July. Nests with eggs observed as late as July 4, and a late observation of an adult feeding recently fledged young recorded in early September. Observations in December-February suggest this species occasionally overwinters in portions of Montana (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

Sexes similar in appearance, but some females show slightly duller plumage than males, especially on crown. Upperparts are olive green with gray breast, long greenish tail, and conspicuous reddish brown cap. White spot above the cheek, a white mustache, and white chin, throat, and belly contrast with gray on head and breast. Juvenile lacks contrasts, mainly brownish gray above and white below (Dobbs et al. 2012).

Habitat

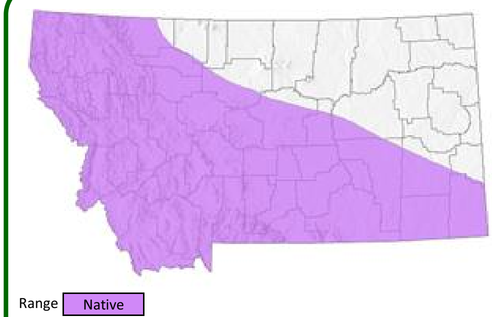
Habitat selected for breeding varies with elevation, prefers species-rich shrub communities. Typically occurs along the ecotone, or edge, of sagebrush communities and other mixed-species shrub communities such as Chokecherry, snowberry, serviceberry, and mountain mahogany (Dobbs et al. 2012).

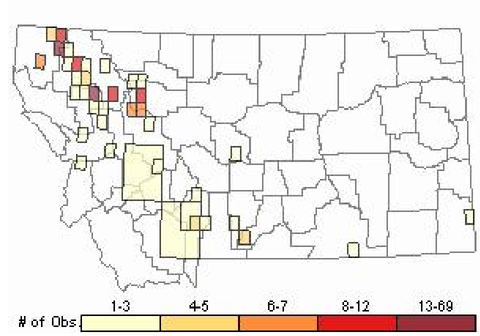
Small Yellow Lady's-slipper
Cypripedium parviflorum

View in Field Guide

Potential Species of Concern
Native Species
Global Rank: G5
State Rank: S3S4

Agency Status
USFWS:
USFS: SENSITIVE
BLM:
MNPS Threat Rank: 2
C-value: 9





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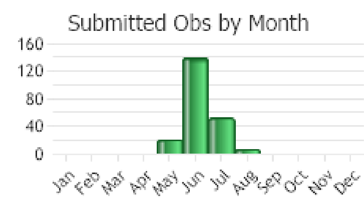


General Description

Small Yellow Lady's-slipper is a perennial with leafy stems 15-40 cm tall, which arise from short rhizomes. The elliptic leaves are 6-7 cm long and sheath the stem; foliage is lightly pubescent and usually glandular. The 1-2 yellow flowers are subtended by an erect leafy bract, which is often longer than the inflorescence. The narrow sepals reach up to 4 cm long, and are wavy-margined or slightly twisted. One petal is strongly pouch-shaped and often purple-dotted; the other 2 petals are united into one that is similar to the sepals but slightly longer. The fruit is an elliptic capsule bearing thousands of tiny seeds.

Phenology

Flowering in May-June, fruiting in July.

Diagnostic Characteristics

Distinguishing characteristics of *Cypripedium parviflorum* include: small, yellow pouch or slipper petal (2-2.5 cm long), sepals conspicuously twisted, and deep reddish brown. This is the only yellow-flowered lady's-slipper in Montana. A hybrid between C. parviflorum and C. montanum can occur where the two species meet, with intermediate characteristics.

Habitat

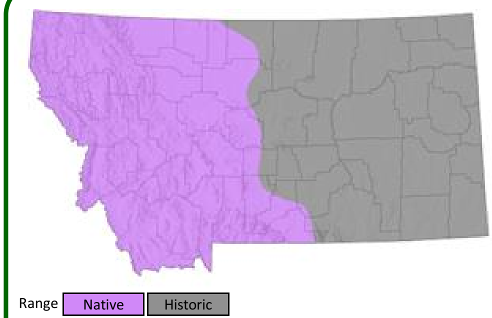
Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in the valley to lower montane zones.

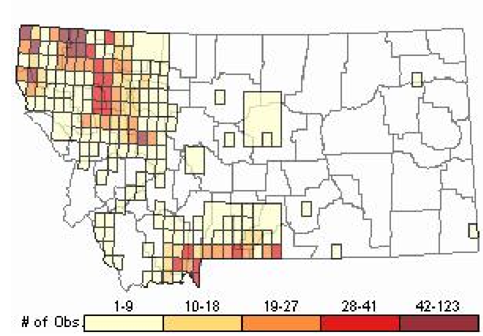
Grizzly Bear
Ursus arctos

View in Field Guide

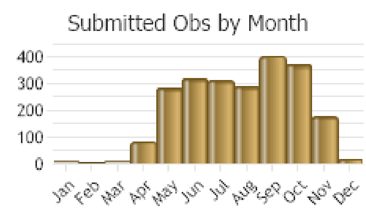
Species of Concern
Native Species
Global Rank: G4
State Rank: S2S3

Agency Status
USFWS: PS: LT; XN
USFS:
BLM: THREATENED
FWP SWAP: SGCN2-3





 # Observations: 2419



General Description

Grizzly Bears have a massive head with a prominent nose, rounded inconspicuous ears, small eyes, short tail and a large, powerful body (Pasitschnaik-Arts 1993). The facial profile is concave and there is a noticeable hump above the shoulders. The claws on the front feet of adults are about 4 inches long and slightly curved. Grizzly Bears range widely in color and size. The most prevalent coloration of Grizzly Bears in Montana is medium to dark brown underfur, brown legs, hump and underparts, with light to medium grizzling on the head and back and a light patch behind the front legs. Other forms, lighter or darker with varying levels of grizzled hair patches, occur in lesser numbers. Although extremely variable depending on the season, adults are around 185 centimeters long (Foresman 2012) and weigh around 200 kilograms in males and 130 kilograms in females (Kasworm and Manley 1988).

Diagnostic Characteristics

Adult Grizzly Bears differ from American Black Bears (*Ursus americanus*) in being larger and by having a hump above the shoulders, a concave (rather than straight or convex) facial profile, shorter and more rounded ears, a rump lower than the shoulder hump, and longer, less curved claws usually evident in the tracks. Identification can be difficult at times and Montana Fish, Wildlife and Parks has developed an Online Bear ID Test to help people better distinguish between American Black Bears and Grizzly Bears.

Habitat

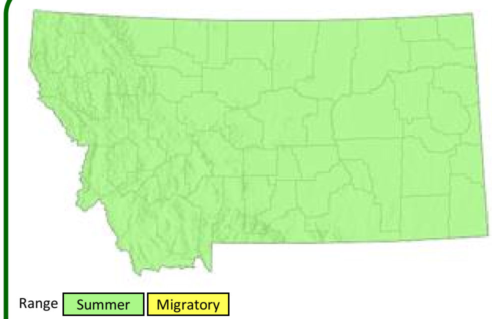
In Montana, Grizzly Bears primarily use meadows, seeps, riparian zones, mixed shrub fields, closed timber, open timber, sidehill parks, snow chutes, and alpine slabrock habitats. Habitat use is highly variable between areas, seasons, local populations, and individuals (Servheen 1983, Craighead and Mitchell 1982, Aune et al. 1984). Historically, the Grizzly Bear was primarily a plains species occurring in higher densities throughout most of eastern Montana.

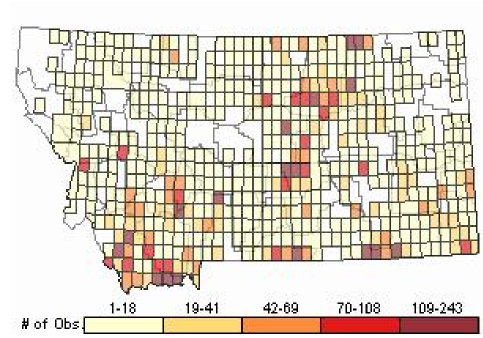
Brewer's Sparrow
Spizella breweri

View in Field Guide

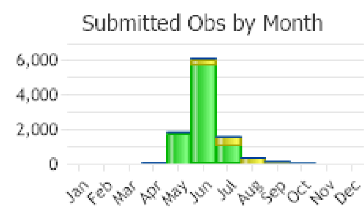
Species of Concern
Native Species
Global Rank: G5
State Rank: S3B

Agency Status
USFWS: MBTA
USFS:
BLM: SENSITIVE
FWP SWAP: SGCN3
PIF: 2





 # Observations: 10089



General Description

The Brewer's Sparrow is a nondescript sparrow of sagebrush habitats. In suitable habitat, the Brewer's Sparrow can be the most abundant species present. Its song, a series of distinctive long and short buzzy trills, can be heard throughout the breeding season (Rotenberry et al. 1999).

For a comprehensive review of the conservation status, habitat use, and ecology of this and other Montana bird species, please see Marks et al. 2016, Birds of Montana.

Phenology

Arrives on breeding grounds by late April. Nests with eggs observed as early as late May. Nestlings observed as early as early June and fledglings by early July (Montana Natural Heritage Program Point Observation Database 2014).

Diagnostic Characteristics

Sexes are similar in appearance. The crown is finely streaked brown; pale gray eyebrow, complete white eye-ring, and a grayish mustache. Underparts dull white, with grayish flanks; breast unstreaked in adult, although sometimes flanks are streaked. Back and rump brown, the latter streaked with black (Rotenberry et al. 1999).

Habitat

The Brewer's Sparrow typically breeds in shrubsteppe habitats dominated by sagebrush. Densities of Brewer's Sparrow correlated with some aspect of total shrub cover (Rotenberry et al. 1999). In sagebrush areas in central Montana, Brewer's Sparrows nested in sagebrush averaging 16 inches high (Best 1970).

Bat Roost (Non-Cave)

Bat Roost (Non-Cave)

View in Field Guide

Important Animal Habitat
Native Species
Global Rank: GNR
State Rank: SNR

Agency Status
USFWS:
USFS:
BLM:

 # Observations: 1623

No photos are currently available

General Description

Information on this species is incomplete.