

Appendix A. More Specific Species and Habitat Best Management Practices

“Planning Trails with Wildlife in Mind” is a non-regulatory document, and the following “Best Management Practices” are recommendations based on the best available science. The BMPs are a suite of tools that follow a hierarchy of avoid, minimize, and mitigate. They should not be construed as being applicable to all site-specific trail development scenarios and do not supersede existing land management plans. Specifically, all Federal agencies must follow relevant land use and regional planning guidance as directed by their specific agency laws, regulations, and policies. Also note that these BMP recommendations are meant as starting points, and don’t replace or negate the need for local consultation and ground truthing of GIS maps. CPW wildlife staff can help work through site-specific inconsistencies and help apply BMPs as appropriate.

The wildlife species and habitat BMPs contained within this appendix expand upon the chart provided in Chapter 2. These are primarily composed of CPW High Priority Habitats (HPH), which are habitats for which CPW has geographic information (i.e., habitat activity layers) and management recommendations, based on field data and peer-reviewed scientific studies. These recommendations represent potentially necessary avoidance, minimization, and mitigation actions to protect wildlife, wildlife habitats, and the safety of recreationists during the trail planning, siting, design, and approval processes. The species included below do not capture all the threatened, endangered, and other species of concern located in Colorado (additional consultation may be required). For detailed information on Colorado’s most vulnerable wildlife species and their habitats, please refer to CPW’s [State Wildlife Action Plan](#) (SWAP).

Considerations

In addition to considering routes, their zone of influence, and the species-specific and habitat-specific best management practices below, it is important to consider avoidance behavior, production areas, winter ranges, the impacts of roads and trails, route densities, and displacement distances, listed here for easy reference.

Species

Below are several best practices for different types of species groups and some specific species. Note that not all species are represented, for reasons including insufficient scientific information or a species not requiring specific best practices.

Big Game

Rocky Mountain & Desert Bighorn Sheep

- ✓ Avoid locating new trails within CPW-mapped bighorn sheep production areas, migration corridors, and winter range habitats.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile within all CPW-mapped bighorn sheep habitats.
- ✓ For any trail within bighorn sheep production areas, implement seasonal timing restrictions for all trail users from April 15 through June 30 (Rocky Mountain bighorn sheep) and February 1 through May 1 (desert bighorn sheep).
- ✓ For any trail within bighorn sheep winter range habitats, implement seasonal timing restrictions for all trail users from November 1 through April 30.



Elk

- ✓ Avoid, to the maximum extent possible, locating new trails within CPW-mapped elk production areas, migration corridors, severe winter range, and winter concentration areas.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within elk production areas, migration corridors, severe winter range, and winter concentration areas.
- ✓ For trails within elk production areas, implement seasonal timing restrictions for all trail users from May 15 through June 30.
- ✓ For trails within elk winter range, implement seasonal timing restrictions for all trail users from December 1 through April 30.
- ✓ For trails within elk winter range, production areas, and summer concentration areas, implement year-round dog-on-leash restrictions.

Moose

- ✓ For trails within moose habitat, prohibit dogs or implement year-round dog-on-leash regulations.
- ✓ For trails within moose habitat, post signage to protect human safety ([Moose In Area](#), [Attention Snowmobilers](#))

Mountain Goats

- ✓ For trails within mountain goat production areas, implement seasonal timing restrictions for all trail users from May 15 through June 30.
- ✓ For trails within mountain goat habitat, post signage prohibiting feeding and harassment.

Mule Deer

- ✓ Avoid, to the maximum extent possible, locating new trails within CPW-mapped mule deer migration corridors, severe winter range, and winter concentration areas.

- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within mule deer migration corridors, severe winter range, and winter concentration areas.
- ✓ For trails within mule deer winter range, implement seasonal timing restrictions for all trail users from December 1 through April 30.
- ✓ For trails within mule deer winter range and summer concentration areas, implement year-round dog-on-leash regulations.

Pronghorn Antelope

- ✓ Avoid, to the maximum extent possible, locating new trails within CPW-mapped pronghorn migration corridors, severe winter range, and winter concentration areas.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within pronghorn antelope migration corridors and winter concentration areas.
- ✓ For trails within pronghorn antelope winter concentration areas, implement seasonal timing restrictions for all trail users from January 1 through April 30.

Grouse

Gunnison Sage Grouse (GUSG) are a federally protected Threatened Species, as defined under the ESA. USFWS mapped critical habitats are the primary resource to help identify occurrences of GUSG or their habitats. Federal law and agency policies largely guide development restrictions related to GUSG. Relevant land use and regional plans supersede any related BMPs within this document. USFWS and CPW wildlife staff may be able to help work through site-specific inconsistencies and help apply BMPs presented within this document on a site-specific basis, as appropriate per relevant agency laws, regulations, and policies.

Columbian Sharp-Tailed Grouse (State Special Concern)

- ✓ Avoid locating new trails within 0.6 miles of Columbian sharp-tailed grouse lek sites.
- ✓ For trails within Columbian sharp-tailed grouse winter range, implement seasonal timing restrictions for all trail users from November 15 through March 15.
- ✓ For trails within Columbian sharp-tailed grouse production areas, implement seasonal timing restrictions for all trail users from March 15 through July 30.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within Columbian sharp-tailed grouse production areas.

Greater Sage-Grouse (State Special Concern)

- ✓ Avoid new trails within 1.0 mile of greater sage-grouse lek sites.
- ✓ Avoid to the extent possible, new trails within greater sage-grouse priority habitat.
- ✓ Within CPW-mapped greater sage-grouse priority habitat management areas, general habitat management areas, and production habitat, implement seasonal timing restrictions for all trail users from March 1 through July 15.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within greater sage-grouse priority habitat management areas, general habitat management areas, production areas, and undesignated habitat.



Gunnison Sage-Grouse (Federally Threatened / State Special Concern)

- ✓ Avoid new trails within 1 mile of Gunnison sage-grouse lek sites.
- ✓ Avoid, to the maximum extent possible, new trails within Gunnison sage-grouse occupied habitat and production areas.
- ✓ Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average within Gunnison sage-grouse occupied habitat and production areas.
- ✓ Within CPW-mapped Gunnison sage-grouse production areas and within 4 miles of a lek site, implement seasonal timing restrictions for trail users from March 1 through June 30.

Large Carnivores

Black Bears

- ✓ For trails, trailheads, campgrounds, and other facilities within black bear overall range, install certified bear-proof trash receptacles
- ✓ For established campgrounds and trail use within black bear habitat, implement [CPW Camping and Hiking in Bear Country](#) recommendations and practices.
- ✓ For backcountry camping and trail use within black bear habitat, implement [CPW Backcountry Camping in Bear Country](#) recommendations and practices.

Canada Lynx (Federally Threatened / State Endangered)

Lynx are tolerant of both motorized and non-motorized recreation at low intensities, but will begin to alter their behavior, activity levels, and potentially the spatial use of their home range as recreation intensity increases. Because lynx select areas that are not intensely recreated, the BMP recommendations in this guide are designed to protect areas with relatively low recreation intensity from fragmentation and trail development. Federal agencies must follow relevant land use and regional planning guidance as directed by their specific agency laws, regulations, and policies. CPW wildlife staff can help work through site-specific inconsistencies and help apply BMPs as appropriate.



- ✓ Limit trail/route densities to less than one linear mile of trail per square mile on average within high-quality lynx habitat.
- ✓ Avoid trail/route placement and habitat fragmentation within identified lynx linkages to maintain landscape connectivity.
- ✓ To protect denning, implement seasonal trail closure of winter-based recreation trails (skiing, snowmobiling) on May 1 annually within high-quality lynx habitat.
- ✓ Avoid/limit tree thinning and removal of trees and/or woody debris to protect snowshoe hare habitat within lynx habitat.
- ✓ Discourage the introduction and expansion of snow compaction activities within high-quality lynx habitat. Locate winter trailheads, parking areas, access roads, and other facilities outside of high-quality lynx habitat.
- ✓ Discourage the introduction and expansion of off-trail motorized over-the-snow activities within high-quality lynx habitat.
- ✓ Plan trail and recreational development and manage recreational and operational uses to provide for lynx movement and to maintain effectiveness of high-quality lynx habitat.

Coyotes

- ✓ For new and existing trails within areas that have well-documented human-coyote interactions, implement year-round dog-on-leash regulations and consider signage at trailheads to inform trail users of this regulation ([Coyotes Active in Area](#), [Protect Your Pets](#), and [Living with Coyotes](#)).

Mountain Lions

- ✓ For trails within mountain lion habitat and in consultation with CPW field staff, implement year-round dog-on-leash regulations and post signage to inform trail users of this regulation ([Mountain Lions in Area](#), [Living With Mountain Lions](#), etc.).

Raptors and Other Avian Species

For raptor species that are in [CPW's Raptor Buffer Guidelines Document](#), please refer to the nest buffer distances and avoidance dates located in that CPW document. In general, depending on the species, nest sites should have a 0.25 to 0.5 mile buffer during nesting season. The below recommendations are for species not included in the Raptor Buffer Guidelines document or where more detailed information and recommendations are necessary to protect the given species.



Least Tern (State Endangered)

- ✓ Avoid new trail construction within 300 feet of the ordinary high-water mark of any stream within mapped least tern production areas.
- ✓ Implement seasonal trail closures for all trail users from April 1 through July 31 within 0.5 miles of mapped least tern production areas.
- ✓ When adjacent to least tern production areas, consult with local CPW field staff to determine if pre-construction field surveys are needed to identify least tern breeding and production area habitats.

Mexican Spotted Owl (Federally Threatened / State Threatened)

- ✓ Prohibit new trail construction within Mexican spotted owl [USFWS designated critical habitat](#) and protected activity centers.
- ✓ Implement seasonal trail closures for all trail users from March 1 through August 31 within 0.5 miles of Mexican spotted owl USFWS designated critical habitat and protected activity centers.
- ✓ When adjacent to Mexican spotted owl designated critical habitat and/or protected activity centers, consult with local CPW field staff to determine if pre-construction field surveys are needed to identify Mexican spotted owl breeding activity sites.

Mountain Plover (State Special Concern)

- ✓ Implement seasonal timing restrictions for all trail users from April 1 through August 15 within 300 feet of active mountain plover nesting sites (pre-construction surveys within suitable nesting habitat of known range may be required per USFWS survey protocol).

Piping Plover (Federally Threatened / State Threatened)

- ✓ Prohibit new trail construction within 300 feet of the ordinary high-water mark of any stream within mapped piping plover production areas.
- ✓ Implement seasonal trail closures for all trail users from April 1 through July 31 within 0.5 miles of known piping plover nesting sites (pre-construction surveys may be required to identify active nesting sites).

Southwest Willow Flycatcher (Federally Endangered / State Endangered)

- ✓ Prohibit new trail construction within 300 feet of known nesting sites (pre-construction surveys may be required).
- ✓ No human activities within 300 feet of a known nesting site from May 15 through August 1 annually.
- ✓ Avoid removal or disturbance of willow patches, boxelder, and cottonwood stands.

- ✓ Implement weed control measures to prevent establishment of non-native plant species in riparian areas.
- ✓ For any project within designated critical habitat, consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act to obtain necessary approvals for federally listed threatened and endangered species.

Western Yellow-Billed Cuckoo (State Special Concern)

- ✓ Prohibit new trail construction within 300 feet of known nesting sites (pre-construction surveys may be required).
- ✓ No human activities within 300 feet of a known nesting site from May 15 through August 1 annually.
- ✓ For any project within designated critical habitat, consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act to obtain necessary approvals for federally listed threatened and endangered species.

White-tailed Ptarmigan

- ✓ Implement seasonal trail closures for all trail users from May 1 through July 15 within white-tailed Ptarmigan winter habitat and overall range.

Small Mammals

Black-footed Ferrets (Federally Endangered / State Endangered)

- ✓ Consult with local CPW field staff for trail projects within mapped black-footed ferret release sites. Where deemed necessary, implement seasonal timing restrictions for all recreational users between the dates of May 1 and September 1.
- ✓ Prohibit dogs entirely within known black-footed ferret habitat or release sites. Dogs can transmit diseases that are lethal to ferrets.



Gunnison's & White-tailed Prairie Dog Overall Range

- ✓ Implement seasonal timing restrictions for all recreational users between the dates of March 1 and June 15 within the overall range of Gunnison's and white-tailed prairie dogs.

New Mexico Meadow Jumping Mouse (Federally Threatened / State Threatened)

- ✓ Prohibit new trail construction within 300 feet of the ordinary high-water mark of any stream within the overall range for New Mexico meadow jumping mice.
- ✓ For any project within designated critical habitat, consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act to obtain necessary approvals for federally listed threatened and endangered species.

Preble's Meadow Jumping Mouse (Federally Threatened / State Threatened)

- ✓ Prohibit new trail construction within 300 feet of the ordinary high-water mark of any stream within the overall range for Preble's meadow jumping mice.
- ✓ For any project within designated critical habitat, consult with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act to obtain necessary approvals for federally listed threatened and endangered species.

Swift Fox (State Special Concern)

- ✓ Implement seasonal timing restrictions for all recreational users between the dates of March 15 to June 15 within 0.25 miles of active swift fox den sites.

Townsend's Big-eared Bat, Mexican Free-tailed Bat, Myotis species winter hibernacula (State Special Concern)

- ✓ Prohibit new trail construction within 350 feet of the cave or mine entrance for any known winter hibernacula (site where hibernation activity occurs).

Riparian and Aquatic Species

Boreal Toads (State Endangered)

- ✓ Avoid trail construction within 300 meters of boreal toad breeding sites.
- ✓ Limit tree removal and minimize trail width, winter grooming, and snow compaction within boreal toad overall range.
- ✓ Within boreal toad overall range, consult with local CPW field staff to identify and avoid specific boreal toad breeding sites.
- ✓ When working within “live” waters (any waterbody that is not dry during the time of construction) or riparian/wetland habitats, disinfect all equipment (e.g., waders, boots, shovels, etc.) both before and after commencing work. Utilize a CPW-approved disinfectant and cleaning method as outlined in the document titled [Quaternary Ammonia Compound Disinfection Protocols](#) to effectively prevent the spread of disease organisms and aquatic nuisance species.

Northern Leopard Frogs (State Special Concern)

- ✓ Avoid trail construction within 300 feet of wetland ponds.
- ✓ Maintain a 300-foot buffer around Northern Leopard Frog breeding sites (emergent marshes).
- ✓ Avoid native grass removal and clear-cutting of trees in wet meadows and riparian areas.



Habitats

Riparian Areas and Wetlands

- ✓ Avoid trail construction within 300 feet of the ordinary high-water mark of any reservoir, lake, wetland, or natural perennial or seasonally flowing stream or river.
- ✓ Avoid removal of native riparian canopy.
- ✓ Where fishing access is the primary purpose of a new trail, construct specific access points to the intended waterway to avoid unnecessary damage to riparian plant communities.
- ✓ For trails adjacent to wetlands, implement year-round dog-on-leash regulations.
- ✓ When working within “live” waters (any waterbody that is not dry during the time of construction) or riparian/wetland habitats, disinfect all equipment (e.g., waders, boots, shovels, etc.) both before and after commencing work. Utilize a CPW-approved disinfectant and cleaning method as outlined in the document titled [Quaternary Ammonia Compound Disinfection Protocols](#) to effectively prevent the spread of disease organisms and aquatic nuisance species.

Stream and River Crossings

- ✓ Construct all crossings at right angles to the stream.
- ✓ Avoid removal of any stream bank vegetation.
- ✓ When working within “live” waters (any waterbody that is not dry during the time of construction) or riparian/wetland habitats, disinfect all equipment (e.g., waders, boots, shovels, etc.) both before and after commencing work. Utilize a CPW-approved disinfectant and cleaning method as outlined in the document titled [Quaternary Ammonia Compound Disinfection Protocols](#) to effectively prevent the spread of disease organisms and aquatic nuisance species.
- ✓ Consult with the local CPW aquatic biologist before working within any perennial stream or river to identify sensitive species and avoidance timeframes (e.g., spawning times).

Tundra

- ✓ For trails above the treeline, implement and enforce year-round dog-on-leash regulations.
- ✓ Restrict recreation above the treeline to designated trails to avoid damaging sensitive tundra vegetation.
- ✓ Designate areas of tranquility for vulnerable species where human activity is prohibited.
- ✓ Ensure that forest patches adjacent to tundra are designated as refuges. Human access, including off-trail activities, in critical (high priority) habitat should be prevented.
- ✓ Snowmobile trails should be restricted to areas that are covered by deep snow through the entire season to avoid damage to sensitive vegetation.