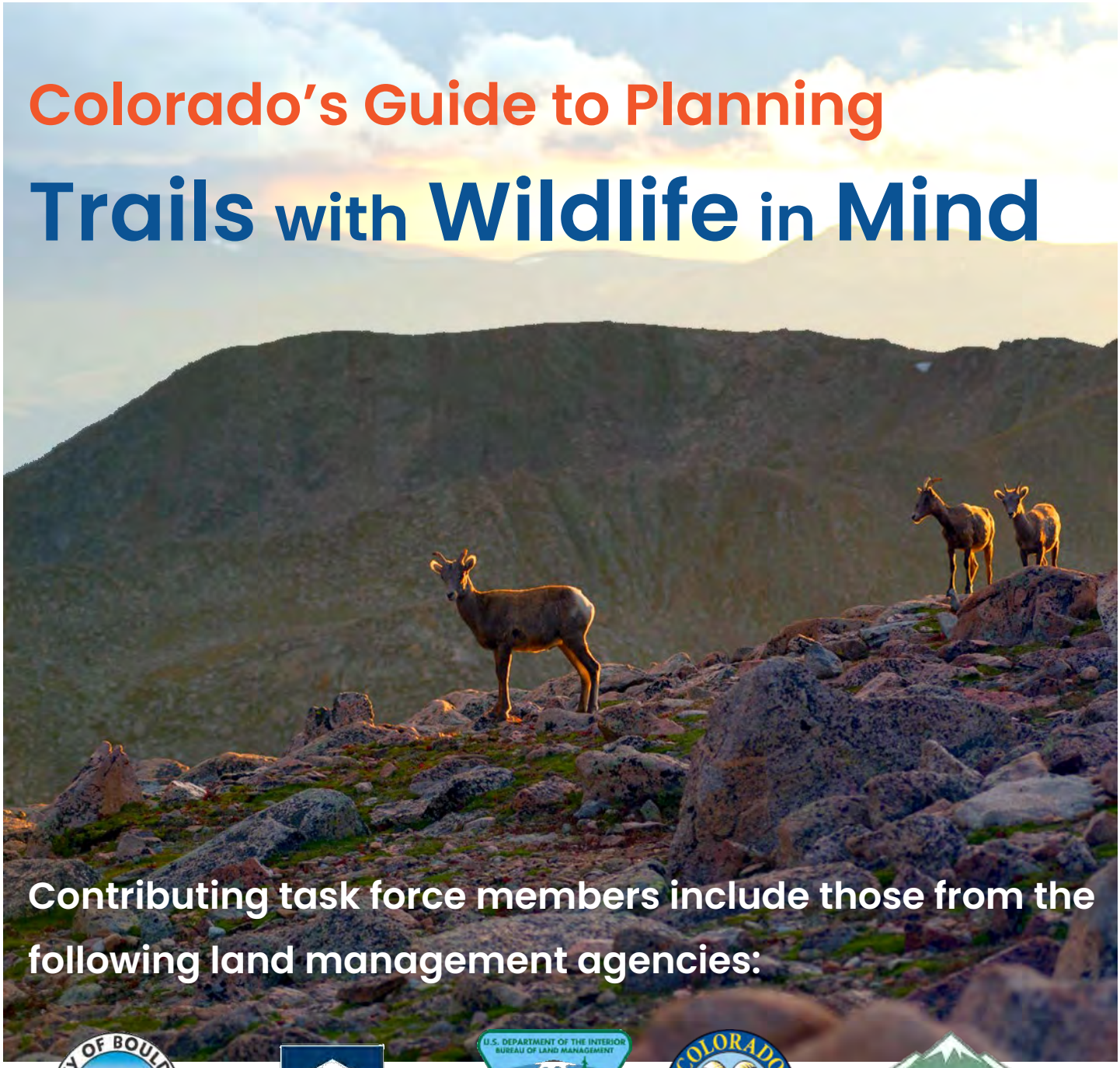
Colorado's Guide to Planning

Trails with Wildlife in Mind



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CITY OF BOULDER Open Space & Mountain Parks

TOWN OF BRECKENRIDGE OPEN SPACE & TRAILS

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

COLORADO PARKS • WILDLIFE

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CRESTED BUTTE, COLORADO A National Historic District

JEFFERSON COUNTY COLORADO Open Space

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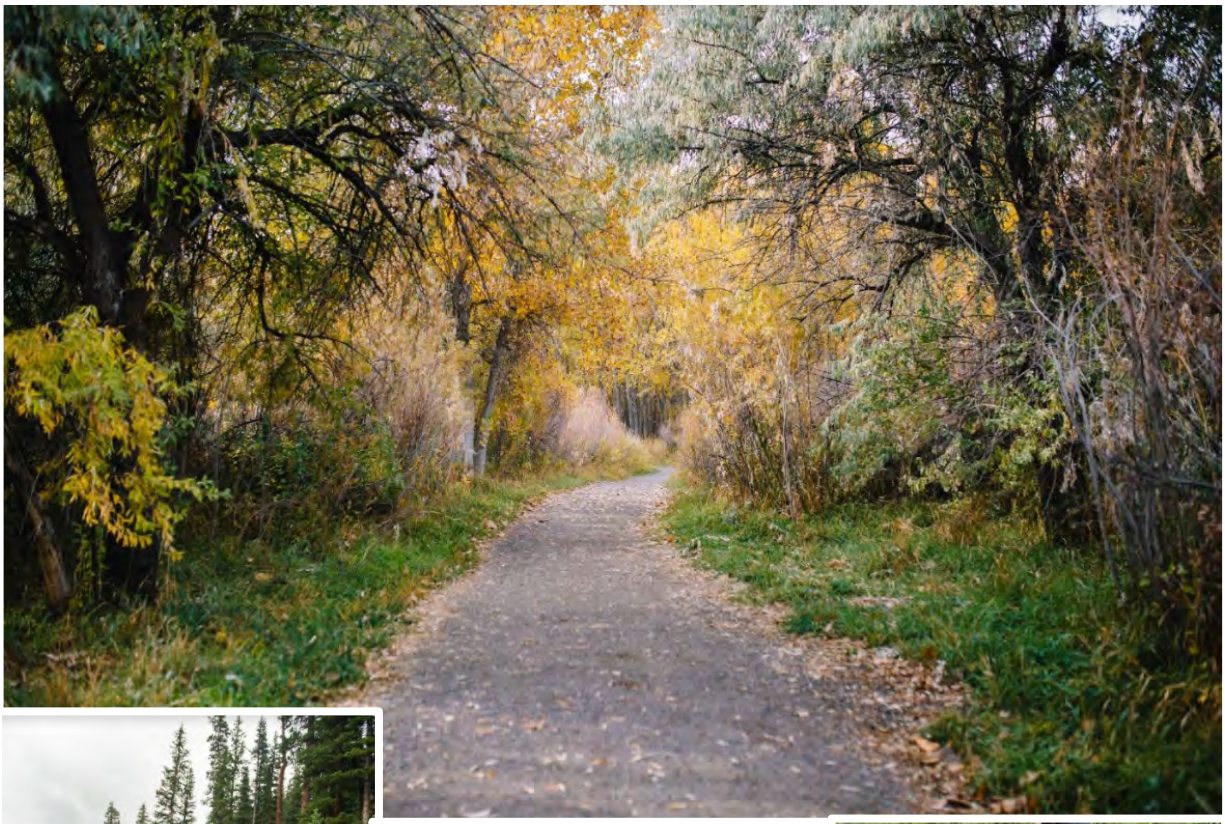

June 2021

Developed by the

Colorado Trails with Wildlife in Mind Task Force

with support by:

Wellstone Collaborative Strategies

in partnership with:

rocky mountain innovation lab



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June 30, 2021

Dear Fellow Coloradans,

Colorado Parks and Wildlife is tasked with providing wildlife management and world class outdoor recreation opportunities. To deliver on this mission it's important to recognize two facts: first, that recreation and conservation goals can often support each other, and second, that partnerships with other organizations and agencies across the state are critical to accomplish those goals. As our population continues to grow and visitation to our public land increases, it's more important than ever to be proactive and intentional with how we plan for recreation to ensure that wildlife still have the habitat they need to thrive.

This need was recognized back in 1997 when a Task Force was convened to draft the first version of Planning Trails with Wildlife in Mind. This guiding document supported land managers over the past two decades as they made decisions about how to best develop and manage trail systems. The 2021 update to Planning Trails brings the original document up to date, and achieved this through a second collaborative Task Force that exemplifies how we need to conduct this work in order to be successful.

CPW believes that deep, long-term partnerships such as the Task Forces convened to develop these documents allow us to work toward shared objectives and ensure delivery of practical solutions both on the ground and at the 30,000-foot strategic level. We believe that the support of our partners enables us to excel at protecting and caring for our most valued and valuable resources in the state, including the many wildlife species that call Colorado home. Our agency continues to seek out opportunities to support and enhance community-level and region-wide efforts to conserve wildlife habitat and accommodate growing demand for outdoor recreation. This document can enhance these efforts to find the common ground between local and statewide priorities by providing a shared language, reinforcing the importance of up-front and intentional collaboration, and driving home the understanding that conservation and recreation are mutually beneficial endeavors foundational to our way of life in Colorado.

I want to express my gratitude and thanks to the Trails with Wildlife in Mind Task Force, as well as the CPW staff and other stakeholders throughout the state that were involved in the development of this important document. Now that it's complete, I hope to see it in use as a tool to engage the public, land managers, and all who recreate to support an outdoor ethic that respects both wildlife and people. Above all, I hope that those using this document view it not as an end to this conversation, but a beginning.

Dan Prenzlow
Director

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Acronyms

AWM: Area Wildlife Manager

BLM: Bureau of Land Management

BMP: Best Management Practice(s)

CODEX: Colorado Conservation Data Explorer

COMBA: Colorado Mountain Bike Association

COPMOBA: Colorado Plateau Mountain Bike Trail Association

COTREX: Colorado Trail Explorer

CPW: Colorado Parks and Wildlife

ESA: Endangered Species Act

FLMA: Federal Land Management Agency

FP: Forest Plan

GOCO: Great Outdoors Colorado

GUSG: Gunnison Sage-Grouse

HPH: High Priority Habitat(s)

HTA: Headwaters Trails Alliance

NEPA: National Environmental Policy Act

NOHVCC: National Off-Highway Vehicle Conservation Council

NPS: National Parks Service

OHV: Off-Highway Vehicle

OSMP: Open Space and Mountain Parks

RMP: Resource Management Plan

SWAP: State Wildlife Action Plan

T&E: Threatened and Endangered Species

TMP: Travel Management Plan

USDA: United States Department of Agriculture

USFS: United States Forest Service

USFWS: United States Fish and Wildlife Service

VVMTA: Vail Valley Mountain Trails Alliance

ZOI: Zone of Influence

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Introduction: Wildlife and Trails Overview

Background and Purpose

Few things are loved more by Coloradans than the outdoors. According to the 2019 Statewide Comprehensive Outdoor Recreation Plan, 92% of residents took part in at least one outdoor activity every few weeks, with many engaging in several activities a week. Using trails is the most popular outdoor activity, with an estimated 400 million days spent by Coloradans on trails every year. No matter your favorite recreational pastime – hiking into the Indian Peaks Wilderness to fly-fish, exploring Taylor Park on an OHV, mountain biking at Lake Pueblo State Park, snowmobiling at Rabbit Ears Pass, or going for a walk around Denver's City Park – trails are the way we access Colorado's outdoors. They also enable residents and visitors alike to experience the joy of viewing wildlife: seeing raptors soaring, bighorn sheep on a ridge, a lizard scurrying across the trail, or ducks on an urban pond. However, all trails and trail uses have some impact on wildlife and their habitats. As our population increases by an estimated 36% to 8 million people over the next three decades, land managers must prepare for both more people wanting to enjoy these outdoor spaces and the subsequent increased impact on the environment.

A trail is a designated route on land with public access for recreation purposes such as hiking, running, bicycling, OHV riding, horseback riding, mountain biking, snowmobile riding, and backpacking.

In 2020, Colorado Parks and Wildlife (CPW) convened a Task Force made up of 20 representatives from CPW, federal agencies, and local agency partners from across the state. In addition to these representatives, the Task Force worked diligently to include voices and perspectives from a diverse array of stakeholders in conservation and recreation (see Appendix D for a complete list). Finally, a technical advisory team contributed extensively to the scientific aspects of the document. This updated document attempts to address the practical challenges facing trail and wildlife advocates in serving both conservation and recreational needs and values.

The 2021 version of *Planning Trails with Wildlife in Mind* updates the best practices and science for Colorado's land managers, trail advocates, and conservationists engaged in trail planning. This guide focuses extensively on collaborative approaches to problem solving. We believe that when trail users, conservation advocates, government agencies, and other community partners sit at the table together, we

achieve outcomes that are greater than the sum of their parts while maintaining respect for the values of all involved. It should be noted that the terms “user” and “visitor” are used interchangeably throughout the document to describe a single or multiple trail recreationist(s).

Conservation and Recreation in Colorado

There are many concurrent efforts in Colorado focused on balancing conservation and recreation. **Trail planning is one aspect of the larger landscape-level and regional planning efforts currently underway across the state.**

Colorado has entered an era where land managers face ever-escalating pressure to meet recreation demands while maintaining the land’s natural resources. Landscape-level and regional planning efforts currently underway across the state are one mechanism that land managers are adopting to meet this challenge. Other powerful tools available to managers include adaptation of trails to support multiple uses, increased connectivity between trail systems across land ownership boundaries, and a greater emphasis on maintenance of existing systems. Even with these options, managers still look to develop new trails for a variety of reasons, including increased demand for quality trail experiences, anticipated population growth, improved access for under-served communities, the mental and physical health benefits from being outdoors, and the economic benefits to a local community. In addition to the benefits trails provide to recreationists, they can also act as tools to support wildlife needs and conservation goals, guiding human-use away from sensitive areas and into places less impactful to wildlife.

Both trails and wildlife are incredibly valuable to Coloradans. Valuing both requires that the conservation and recreation communities come together to reconcile supporting wildlife needs with an increased demand for trails. As a community we must plan for increased impacts by utilizing management tools geared to the unique sensitivity of the habitats and wildlife populations. We need to elevate strong regional and local planning early on, long before lines on a map are drawn or volunteer trail building crews put boots on the ground. Trail design guidebooks by both the International Mountain Bicycling Association and the National Off-Highway Vehicle Conservation Council each highlight how early master planning helps to better define trail concepts, concentrate trails, increase restoration opportunities, and protect wildlife without sacrificing the trail experience.

Trails serve dual purposes: Connecting people to the outdoors and managing people on the landscape. This document provides a framework to achieve a vision that recognizes:

Trails in Colorado connect people with nature and support a high quality of life for all; proper trail planning, design, and management can minimize impacts and can serve as a tool to support resilient landscapes, wildlife, and biodiversity.

Core Principles to Guide Outdoor Planning

To help create a strategy towards the future described above, the Task Force adopted the Colorado Outdoor Principles and added an additional equity principle to guide the development of this document.

Science-based Decisions - Physical, biological, and social science must inform the management of outdoor recreation. **Management decisions should be grounded in the best available scientific information to ensure the protection of natural areas** and the sustainability of resources and should be applied adaptively to avoid restrictions that are overly or unnecessarily broad. This information is also necessary to maintain and enhance the quality of outdoor recreation experiences.

Equity and Inclusion – Actively engage *all* Coloradans to expand recreational access, conserve our ecosystems, and ensure inclusive planning processes. **We are committed to support a welcoming, inclusive, and accessible environment for all visitors to our facilities and public lands.**

Working Together - Both recreation and conservation are needed to sustain Colorado's quality of life. Both are beneficial to local economic well-being, for personal health, and for sustaining Colorado's natural resources. **This mutual need exists because outdoor recreation helps people understand the importance of maintaining healthy and intact ecosystems. That understanding builds support for natural resource protection and stewardship. In turn, conservation protects the land, water, and wild places upon which outdoor recreation depends.**

Minimize Impact - All recreation has an impact. Coloradans have an obligation to minimize these impacts across the places they recreate and the larger landscape through ethical outdoor behavior. **Ethical outdoor behavior demonstrates respect for land, water, and wildlife. This outdoor ethic is critical and must be developed in current and future users.**

Management and Education - Proactive management solutions, combined with public education, are both necessary to care for land, water, and wildlife, and to provide the protections needed to maintain quality recreation opportunities**. Active public engagement in crafting solutions is necessary to ensure that land management decisions reflect a consensus and can be effectively implemented. A broad, landscape approach is necessary in order to meet both conservation and recreation needs.** Collaborative decision-making is needed to decide which activities are best suited for various landscapes.

Outcome-Based Planning Framework

This document is grounded in the overarching framework of Outcomes-Based Planning. ***Figure 1*** depicts the outcomes-based framework for trail planning, from identifying outcomes and needs to siting and managing a trail. The chapters in this document are organized to reflect the flow through this framework. **Chapter 1** describes the importance of building partnerships through collaborative processes, how to engage the public, and strategies to define desired outcomes (Step A). **Chapter 2** explores how to identify opportunities for trails and assess the needs of wildlife (Steps B and C). **Chapter 3** details the trail management and monitoring practices needed to minimize wildlife impacts after completing trail construction (Step D). **The Appendices** of this document provide multiple resources, including species-specific best management practices, examples of planning frameworks used in different areas of the state, and an extensive list of scientific literature used as the basis for this document.

Figure 1. Outcomes-based trail planning framework

Objectives

It is our intent that this document be easy to share and to reference throughout the collaborative process of trail planning. Informed by Advisory Groups and other stakeholders, the 2021 update to *Planning Trails with Wildlife in Mind* serves the following purposes.

1. Acts as a framework for how we effectively work together in conservation and recreation, providing direction to get collaborative conversations about trails and wildlife started early, and emphasizing the value of communication and collaboration between, and within, communities.
2. Improves communication and collaboration between government agencies regarding trails and wildlife by establishing common language, and by building consensus around best practices.
3. Provides best practices grounded in current, relevant science concerning the impact of trails and trail recreation on wildlife, while remaining accessible as an educational tool for readers of all backgrounds.
4. Offers guidance to groups advocating for new trail construction or maintenance projects, detailing how to factor wildlife impact into their plans. It serves as a starting point for addressing wildlife concerns when submitting State Trail Grants, and provides a framework for how to work collaboratively with government agencies to find solutions that balance wildlife and recreation needs.

Considerations

Since proper trail management, planning, and design can minimize impacts to natural resources and can serve as a tool to support resilient landscapes, wildlife, and biodiversity, this document offers a process to eliminate poorly managed or unmanaged use. Thus, this document should be viewed through the context of a specific project and the landscape impacted by the project. Not everything in these guidelines applies directly to every specific project, but the information and process proposed here are a great starting point for land managers, recreation groups, and conservation advocates, especially when used and considered in tandem with larger regional and local planning efforts in your area. This document is not meant to advocate for or against new trails, but rather to help determine where trails can be placed on the landscape with the least amount of impact on wildlife.

While there is a desire for this document to achieve many goals and serve many purposes, it remains focused on trails and wildlife. The following includes responses to common expectations voiced by stakeholders that lie **outside** the scope of this document:

1. The document is not intended to supersede agency-specific policies or processes – it is a guide for those who wish to enhance their policies or processes, and an explanation for why certain policies and processes already exist within some agencies.
2. The document is focused on trails as they relate to wildlife and does not focus on the extensive benefits of trails to people, as there are many other resources that serve that purpose.
3. While trails impact wildlife, they are certainly not the only source of adverse impact. Development, natural resource extraction, disease, wildfires, invasive species, roadways, and climate change, to name a few, each impact wildlife in unique ways. A focus on those stressors is outside the scope of this document. **While planning, it is important to remember the cumulative impact of other stressors on wildlife, and to put trail development in that context.**

The Task Force for *Planning Trails with Wildlife in Mind* was intentionally made up of land managers because they are seen as the main audience for this document. Ideally, when trail or wildlife needs are proposed at the local level, land managers can convene a core team as described in Chapter 1 and use this document as the guiding framework for their process. All trail proponents and wildlife advocates should ensure that the local land manager they are working with is starting from the collaborative framework outlined in this document.

Chapter 1. The Collaborative Process

Collaborate early and often

Chapter Focus: Diverse interest groups need to continue coming together to create strategies that work for wildlife, habitat, conservation, and recreation interests through well-facilitated collaborative processes. An extensive increase in collaboration between wildlife management, regional planning, and recreation interests, especially early in the process will result in community buy-in and excitement. It also ensures successful implementation, viable trails for the long-term, and ultimately creates better solutions. *Figure 2* provides a framework that supports collaboration between project proponents, land managers, and CPW staff, and demonstrates how to best engage the public.

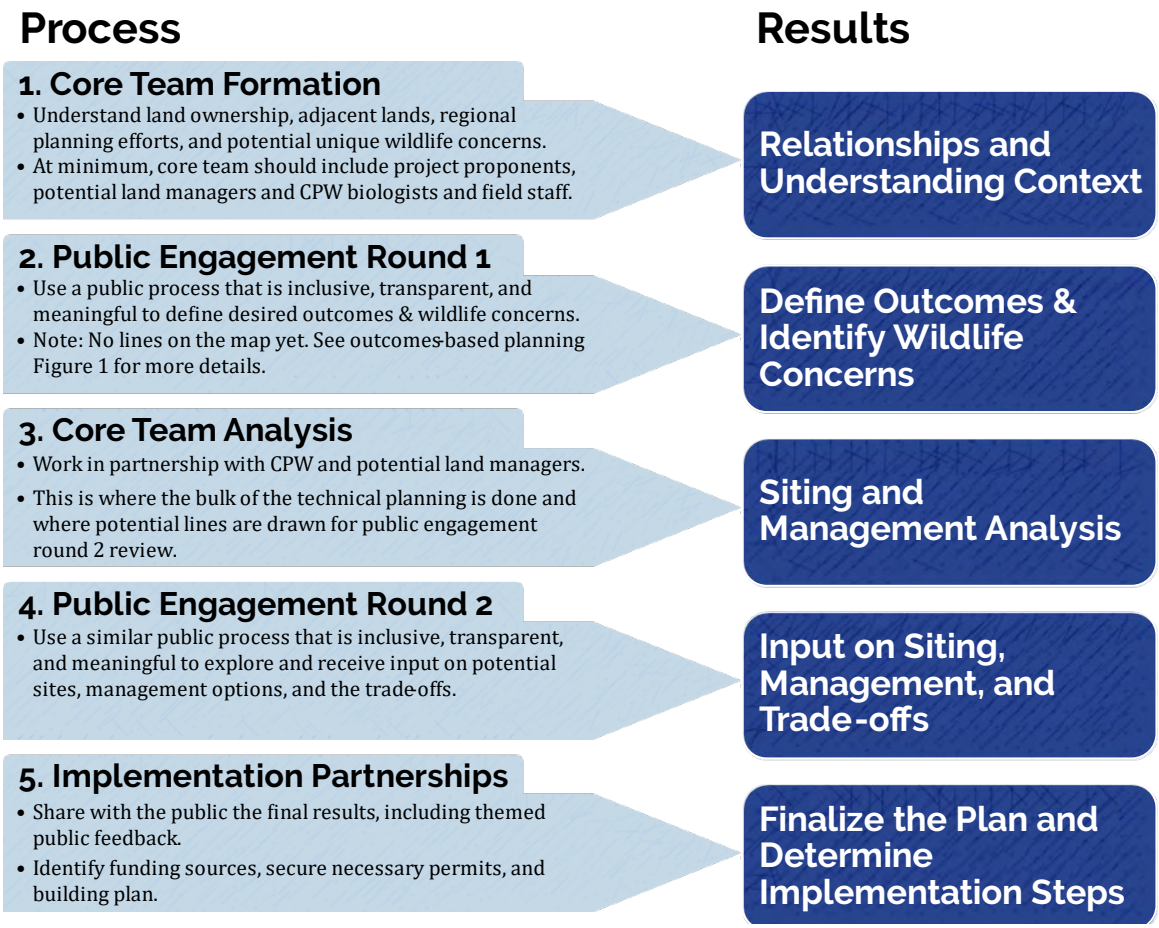


Figure 2. Framework for collaboration and public engagement

Core Team Formation

Relationships

Partner with Agency Stakeholders. At a minimum, project proponents should consult with local CPW biologists and field staff, appropriate land management agencies (federal, state, local, tribal, or private), and/or county or municipal agencies at the beginning of a trail planning process. Ideally, trail project proponents will form a core team that includes these and other partners. This will help project proponents engage in long-term planning partnerships with these agencies and stakeholders. By bringing agency staff and stakeholders into the process early, challenges and solutions can be identified quickly (see Chapter 2).

Bring Conservation and Recreation Interests Together. In addition to project proponents and agency representatives, the core team should include a liaison to the area's Regional Partnership (referenced on the next page), conservation and recreation advocates, and other key community stakeholders. Through the Outcomes-Based Planning framework established in Figure 1, this team can work together to define what success means for the project. These conversations contribute to understanding the requirements of the project before too much investment has occurred, because identifying unique wildlife resource concerns early on is the most effective method to avoid and minimize impacts to wildlife from recreational activities (see Appendix A for full list of recommendations). The core team can review data and research together, get feedback, and share interpretations, making it much easier to collaboratively identify potential trail alignments or realignments when the project reaches that step (see Chapter 2).

Collaborate Case Study:
Palisade Plunge

The 34-mile singletrack Palisade Plunge trail is the result of ten years of collaboration between a wide array of stakeholders, including the BLM, USFS, Bureau of Reclamation, Town of Palisade, Mesa County, City of Grand Junction, CPW, local ranch operators, private landowners, and Colorado Plateau Mountain Bike Trail Association (COPMOBA). In addition to traversing land managed by federal agencies, the trail crosses City of Grand Junction and Town of Palisade managed watersheds and property, leased ranching and hunting lands, and private property. Given the number of unique stakeholders involved, Scott Winans, long-time President of COPMOBA, noted to the Colorado Sun that "a big project like this could have been killed along the way by any one of these partners. Not out of malice, but just by having a priority that doesn't quite jibe with [everyone else's]." Fortunately, the shared vision for the Plunge was strong enough that when priorities among stakeholders differed, the only thing to shift was the proposed trail alignment.

A major consideration when planning the Plunge was the trail's potential impact on wildlife. At multiple points during the planning process the trail was rerouted to avoid sensitive wildlife areas such as raptor nests, and allowances were incorporated into the management plan to temporarily close sections of the trail near these areas if impacts from trail users were deemed too great. In addition, annual seasonal closures from December 1 – May 1 were established in elk and mule deer winter range habitat. By implementing and enforcing seasonal trail closures on the Palisade Plunge and trails throughout the Grand Valley, regional wildlife managers can provide wildlife the space and time they need to survive.

Understanding Context

Consider Land Ownership Implications on the Process. Additional steps might be determined by who owns the land, how the land was acquired, and who is funding the project. Having this information may also lead to expansion of the core team. Additionally, it's important to understand adjacent land ownership and how that might impact the trail plan and wildlife.

Specific Considerations for Federal Lands

Federal lands are managed by Federal Land Management Agencies (FLMAs) including the US Forest Service, Bureau of Land Management, National Park Service, and US Fish & Wildlife Service.

- Most FLMAs have Forest Plans (FPs), BLM Resource Management Plans (RMPs), Travel Management Plans (TMPs), or other land use management plans in place. Consult with these agencies early during the planning process to learn about these landscape-level plans.
- FPs, TMPs, & RMPs identify current and future routes, trail uses, closures, and seasonal closures. These planning processes allow advocates to get involved in planning and designing quality trails and systems.
- FLMAs are required to go through the National Environmental Policy Act (NEPA) process prior to making decisions, which, in addition to habitat fragmentation, considers vegetation, soils, air and water quality, and cultural resources. NEPA requires public comment and review opportunities.
- TMP development is a high priority for FLMAs. Many FLMAs have shifted from "open" unrestricted use of public lands to limiting motorized and mechanized travel to designated routes.
- Emphasize early stakeholder and public involvement in the NEPA and TMP processes for Federal lands (as well as state and local).
- TMPs on public lands that change strategies from an open system of travel to limited, generally reduce existing road and trail mileage significantly. New trails or networks located in less impactful areas may be proposed based on local needs with an emphasis on quality over quantity.

Specific Considerations for Local and State Lands

- County-wide master plans.
- Municipal land-use restrictions.
- State Wildlife Area, Natural Area, and Park Management Plans.
- State Wildlife Action Plan.
- Conservation easements.

Specific Considerations for Private Lands

- Engage with potential private land partners early in the process.
- Engage with local Land Trust(s) to understand conservation easements, and any site-specific agreements concerning agriculture, ownership, restrictions, habitat protections, ranching and livestock.
- Understand the intention of donor/seller of land or easement to use land.

Get Involved with Regional Planning Processes. Planning a specific trail should also be integrated into larger, regional planning processes such as Regional Outdoor Partnerships, GOCO Communities, and/or existing roundtables or other similar initiatives (e.g., Envision Chaffee County). Project proponents should understand the needs of larger regional planning efforts and how their potential project could address those needs. Working with a liaison, or participating directly in regional partnerships, encourages everyone to look at recreational trails at a landscape level versus planning one

trail at a time. Project proponents should also be sure the specific trail project is understood in the context of area recovery, management, and master plans, as well as the State Wildlife Action Plan (SWAP).

Recognize this as an Ongoing Collaborative Process. Be aware of the need to revisit some of these collaborative steps again and again. For example, a trail might be planned in close cooperation with a wildlife biologist, but it might not fit with the intent of a management area, a regional plan, or county planning map. It would be useful to know ahead of time whether a land use plan or Resource Management Plan (RMP) allows for trail development in a certain location. If not, alternate locations can be identified. Reviewing and understanding the direction in regional plans and existing zones and designations are important first steps in the collaborative process.

Public Engagement

Reach out to the Community Early and Thoughtfully. Regional planning processes should already include community outreach, but if your trail project is not part of one of these processes, be sure to include community outreach as part of your Outcomes-Based Planning. Having a diversity of opinions and perspectives represented in your outreach and communication plans (e.g., surveys, public meetings, online forums, focus and affinity group conversations) can help achieve successful project outcomes.

Understand the Complexities of Good Collaboration.
success of these projects to leave collaboration to chance. Instead, ensure good facilitation, identify conflict resolution processes, and set clear expectations from the outset for both the core team and public engagement. Also recognize that collaboration doesn't always mean full consensus and may often require acceptable compromises. For example, encourage people to come together through shared values, such as the Colorado Outdoor Principles. In addition, productive engagement and collaboration starts with the following:

1. Use a participatory approach: Engage in a participatory approach. Many projects should have at least two windows of engagement. The first typically focuses on unmet needs and the second on solutions. All meetings should be full of engagement and be fully inclusive, relying on adult learning methods. Get the participants talking early and mix up any presentation time every five or ten minutes. Otherwise, people will not be able to pay attention for long.
2. Ensure participant diversity: Find diverse community members by advertising and showing up at locations where they engage the community (e.g., local businesses, the grocery store, local paper, places of worship, etc.). It is critical to bring to the room not just the typical folks who engage but people who represent all interests, and especially those who are most impacted by the effort and those with lived experience. Diversity of opinions ensures that the feedback is truly balanced.
3. Engage community members in the data: While it's important to have community opinions, it's also important that when data is available, this data is clearly communicated to community members. Just as managers and planners each wrestle with data to find the best approach or understand needs, the community can also provide their perspectives after considering the information.
4. Rely on and support community members: When convening focus groups or community meetings, tap into local members who can speak the preferred language, be culturally sensitive, and speak as a member of the community. Work to build local capacity within the community where there is a need.
5. Provide strong accessibility: If hosting meetings or focus groups, find out what the community members need to participate, such as childcare, compensation, certificate of recognition, food, specific meeting times, translation and/or interpretation, transportation, etc.

6. Support community's power: Tap into the community's own power – learn where the community needs support from your group and provide that to augment their work.
7. Follow-up: After the event, communicate on the project's progress to the interested public and describe how they helped shape the effort. Learn from each meeting and improve! Don't be shy to share what you've learned.

Helpful considerations from the field

- Do not draw lines on a map or share a specific trail alignment with the public too early. Instead consider using circles to convey general areas of interest.
- Be transparent about the actual cost/benefit modeling so that the community and stakeholders can make informed, intelligent decisions together.
- In the absence of regional planning processes, additional stakeholders to engage with during a trail-planning process might include conservation groups, recreation advocates, local and regional governments, user groups, landowners, and local communities.

Ensure the Process Incorporates Equity, Diversity, and Inclusivity Values. When designing a process for regional planning or trail planning, an inclusive and equitable process is critical. This includes direct outreach to bring traditionally under-represented communities into the conversation to ensure diverse participation. This engagement is a critical step in ensuring that the process balances the true range of community and user needs while increasing the possibility of successful outcomes for all parties. One goal should be to get people involved early and keep them engaged throughout the planning effort. The State of Colorado's Community Partnerships Principles Guide is a great resource to support implementation.

Maximize Data-Informed Decisions During the Collaborative Process. While projects might be driven locally or by specific recreation interests, scientifically validated tools should be used to help make data-informed decisions. As a reminder, Chapter 2 provides an overview for desktop and field analysis, as well as siting considerations. This guidance is complemented by Chapter 3, which offers recommendations for trail maintenance and management. Appendices A and B of this document dive even deeper into the research.

Questions to answer collaboratively:

- Considering the full community, including those traditionally under-represented in trail conversations, what types of trail opportunities are most needed and missing from the landscape?
- Where do people want to recreate (near water, access to peaks, easy accessibility, etc.)?
- How do they want to recreate (use types based on region)?
- How do they consume information (signage, education, communication methods)?
- What are the intended uses, experiences, and desired recreation opportunities for the trail system?
- What are the prioritized or most abundant recreation types for this area and for this trail? How many users can the trail and the surrounding landscape accommodate? (See the Visitor Capacity Guidebook for a reference.)
- Where can trails be built that minimizes impacts to wildlife? (To be analyzed in processes described in Chapter 2 and for discussion during round 2 of public feedback.)

Public Engagement Round 2 and Beyond. Clear public communication and education remains critical throughout the process. After completing desktop and field analysis (see Chapter 2), planners and core team members should reengage the public to discuss alternative trail locations and what the

potential impacts could be on the landscape. Share awareness about wildlife and areas of concern, and keep in mind that when the public thinks about wildlife, they are often only thinking about big game (deer, elk, moose, pronghorn, and bear). Communicating a broader understanding of wildlife and habitat supports the overall transparency of a project.

Helpful considerations from the field

- The public outreach process can help the public understand the greater biodiversity of the area, learn how their roles can minimize impacts, and the see the reasoning behind certain planning decisions.
- Transparency is key – It's important to share available information, while making sure the public understands that CPW doesn't have conclusive data on every habitat and species in the state.
- Put the science in context. The available data, science, and literature are very detailed, and wildlife managers or other experts can help interpret and apply the science appropriately.

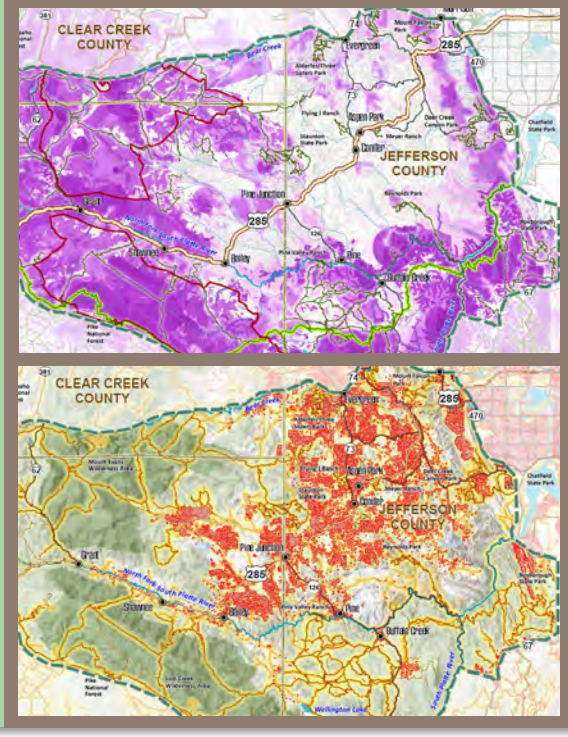
Outside 285 Case Study

As part of an ongoing process, the Colorado Mountain Bike Association (COMBA), CPW, and the South Platte Ranger District of the Pike National Forest have initiated a regional planning effort focused on identifying opportunities for trail improvements and wildlife habitat conservation within public lands surrounding the US-285 corridor southwest of Denver. Together with a steering committee of 19 other land managers, wildlife biologists, wildlife advocates, and recreation user groups, the group is undertaking a year-long planning process to develop a Master Plan that proposes regional recommendations for conservation, recreation development, management, and maintenance. In the summer of 2020, the group conducted a habitat analysis of the Outside 285 region and created two maps: An Existing Disturbance Map and a Habitat Sensitivity Map.

To generate the Existing Disturbance Map, the planning team considered a variety of existing developments and human uses, ranked from high to low disturbance potential. To make their model as relevant to on-the-ground conditions as possible, they also considered multiple levels of disturbance from a single source. For example, existing trails were given both a medium-disturbance radius of 100m (recognizing that the highest intensity impacts are close to trails) and a low-disturbance radius of 400m (recognizing that lower intensity impacts extend well beyond the immediate trail area). This incorporates into the mapping process the fact that higher intensity disturbance exists on and near trails, but that even wildlife farther away may still be disturbed by recreation.

The Habitat Sensitivity Map highlights those areas within the region with the highest relative sensitivity and conservation priority. The map was created using a collection of publicly available GIS data and first-hand knowledge from CPW and USFS field personnel concerning known or potential habitat for endangered, sensitive, and species of management concern. This data was categorized into three priority levels – A, B, and C – based on the level of sensitivity of each habitat type, their federal listing status, USFS sensitive designation, CPW importance, NatureServe rank, and State Wildlife Action Plan (SWAP) tier.

Used in conjunction with one another, these analyses allowed the planning team to identify focus areas within the region. These included areas with existing issues or habitat impacts, and areas presenting opportunities for new trails, trail linkages, and habitat restoration.



Chapter 2: Evaluating Wildlife Needs and Trail Opportunities

Chapter Focus: This chapter serves two main purposes. First, to enhance trail project planners' and core teams' understanding of wildlife concerns and limitations. Second, to explain how to take these issues into account when considering trail siting opportunities. The chart below outlines the three components of understanding limitations and siting, which are then examined in greater detail throughout the chapter.

1. **Evaluate Wildlife Habitat.** Specific considerations include:

- Utilize existing scientific tools and research as references, such as CPW's High Priority Habitat Maps, for evaluating wildlife habitat relative to trail projects.
- Consider threatened, endangered, imperiled, and declining wildlife species.
- Evaluate existing trails, both for potential improvements that might lessen the need for additional trails and for potential closure and restoration opportunities to offset impacts of new trails.
- Complement the desktop analysis by conducting a site visit with local CPW staff.
- Evaluate seasonal wildlife use by life cycle needs.

2. **Siting Considerations.** During a site visit, consider the following elements and opportunities with regard to potential trail locations:

- Understand zones of human influence and disturbance.
- Consolidate high-density trail networks in less sensitive wildlife habitats.
- Avoid habitat fragmentation and maintain habitat connectivity.
- Identify potential human-wildlife interactions.
- Identify habitat restoration opportunities.
- Plan for mitigation.

3. **Consider human dimensions that impact wildlife and habitat.** These include but are not limited to:

- The driving forces behind people's decisions.
- The human behaviors that lead to change.
- The effects of change on natural resources and quality of life.
- Management strategies to address change.

Overview

There are often multiple competing priorities in open space that land managers, stakeholders, and the public need to understand. Sometimes limited resources, competing priorities, critical wildlife values, and conflicting stakeholder needs require trade-offs to maintain collaborative conservation and recreation relationships over the long-term. This chapter is not meant to advocate for or against new trails. Instead, it is meant to help determine where trails can be placed on the landscape with the least amount of impact on wildlife.

As land managers seek to accommodate recreational demand, it's important to recognize how trails can function as a tool to manage where people go on the landscape. **Trail design should minimize the impacts that people have on the natural resources of a given landscape, including both wildlife and their habitat. Good trail design also enhances the visitor experience and provides opportunities to enjoy the natural world, which includes viewing wildlife.**

The decision to add a new trail means you are introducing a new use, and any associated impacts, onto the landscape. *Figure 3* provides a framework for understanding the decision process of where a trail might be sited relative to habitat. In some cases, such as for threatened and endangered species, if impacts cannot be avoided, and minimization and mitigation efforts cannot sufficiently protect the species, a trail may not be able to be built in that location. Doing an evaluation of the existing site conditions at the beginning of this process can help a land manager or trail planner decide where those trails belong on the landscape and what areas it would be best to avoid.

NOTE: This decision tree does not take the place of a site visit or consultation with land managers; nor does it account for exceptions to the rule (e.g., developing a trail instead of more impactful development). Trails may also need to avoid any impact to federally threatened or endangered species or if avoidance is the only acceptable strategy to prevent wildlife impacts. As such, a trail planning process may need to pause prior to "minimize." See the following page for definitions of terms.

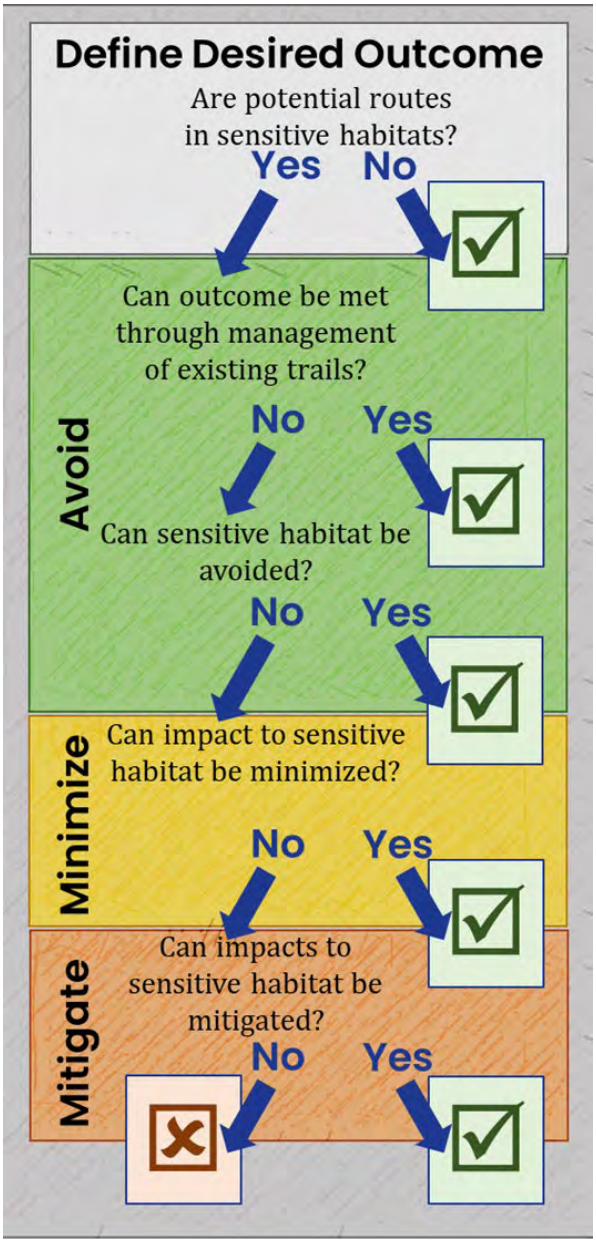


Figure 3. Simplified decision tree for trail siting with wildlife in mind. *Sensitive Habitat is used as a catch-all term for specific habitats in which avoid-minimize-mitigate measures may be necessary. Checked boxes indicate that a trail may be possible based on its potential impact to wildlife or habitat. A box with an X indicates that trail approval is unlikely based on its potential impact to wildlife or habitat.*

Helpful considerations from the field

- Data needs to include human dimensions (see overview, Chapter 2) and the user experience; the purpose, goals, and capacity of the trail or trail system; and a nuanced understanding of the flora and fauna and its needs in their area.
- Data does not automatically determine decisions but does highlight sensitive wildlife habitats and provides a scientific basis for project planning.
- Scientific information referenced in this process should be sound and peer reviewed.
- Consider the concept of a "sliding scale for data needs." Not every project needs extensive data collection. For example, a project in low-quality habitat may require less data to feel confident in moving forward. In contrast, a project in a sensitive habitat would likely need more data. Working collaboratively from the outset ensures that the wildlife biologists, recreation interests, and planners are working together to decide what data is needed and how it can best be used.

Key Terms and Concepts

The following terms and concepts are used throughout this chapter and are explained here:

- Habitat. A place where an organism makes its home, and that meets all the environmental conditions an organism needs to survive. The components of a habitat are water, food, cover, and space, all in a suitable arrangement. For a wild animal, essential habitat includes water, forage, cover, breeding, and reproduction areas, as well as movement and migration corridors to connect all of these components daily and throughout the year. Habitat management is an essential aspect of wildlife management, and it ensures the essential needs of wildlife species are met.
- Avoid Impacts. Strategies that place trails or sites for ancillary facilities (e.g., parking lots, trailheads) outside of biologically sensitive habitat types.
- Minimize Impacts. Strategies that reduce biological impacts through the application of Best Management Practices to reduce the extent, severity, significance, or duration of unavoidable impacts.
- Mitigate Impacts. Strategies that compensate for unavoidable adverse impacts to wildlife and habitat, including habitat replacement, on- or off-site habitat enhancement, or contribution to larger scale conservation projects.
- Seasonal Timing Restrictions. A restriction on trail use during defined date ranges that captures an important and sensitive life history stage for a given species. Examples include reproduction and wintering periods when animals are in a vulnerable state.
- Buffer Zone. A defined distance (radius) surrounding a sensitive wildlife location, such as bird nest sites or grouse lek sites, where human activities should be limited to protect the given wildlife resource from disturbance. Disturbance within the buffer could cause a decline in wildlife reproduction or survival. Each recommended buffer distance is based on the best available science and CPW's field staff expertise.
- Production Area. That part of a species' overall range where production (calving, fawning, nesting, etc.) and rearing of young occurs. This activity often occurs in the spring of each year for most species.
- Migration Corridor. A specific mappable site through which large numbers of animals migrate and loss of which would change migration routes.

- Migration Pattern. A subjective indication of the general direction of the movements of migratory ungulate herds.
- Habitat Connectivity. The degree to which the landscape facilitates or impedes animal movement and other ecological processes.
- Habitat Effectiveness. The relative amount of habitat that is fully usable by a given wildlife species, compared to the total amount of potential habitat.
- Sensitive Habitat. Any distinguishable habitat that either exists in a limited quantity relative to the broader landscape (e.g., riparian), and/or those that are very difficult to restore once they've been damaged (e.g., tundra).
- Sensitive Species. Any species whose habitat, distribution, population size, and population condition is adversely affected by pressures arising from human activities.
- Zone of Influence (ZOI). The area beyond a route's physical footprint in which on-trail activities affect wildlife behavior and habitat use.
- Winter Concentration Area. That part of the winter range where densities were at least 200% greater than the surrounding winter range density in the majority of the previous ten years.
- Severe Winter Range. That part of the overall range where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.
- Route Density. A measurement to assess the number of given roads and trails within a defined geographic area. For the sake of this document, densities are indicated as the number of road/trail miles per square mile. This can be calculated across different scales depending on the scope of a proposed project and wildlife habitats present.

Evaluating Wildlife Habitat

Use Desktop Analysis Tools. Prior to visiting potential trail sites, planning teams should conduct a desktop analysis, or analysis using previously collected data, to understand opportunities for trail alignments. Extensive scientific tools and research exist as references for evaluating wildlife habitat relative to trail projects, such as CPW's High Priority Habitats and Species Activity Mapping. By using one of these tools, such as CPW Species Activity Mapping tool, CPW species layers, Colorado Conservation Data Explorer (CODEX), forest-wide models of potentially suitable habitat for Canada lynx or Mexican spotted owl, USFWS critical habitat units, and the Colorado Hunting Atlas, the core team can review many of the habitats that a trail may intersect when considering a new route (additional tools in Appendix C). The team can then create a list of species and habitats with which the potential trail might overlap. While these tools are effective to understand large-scale wildlife presence, they are less effective at a local level and cannot replace consultation with local CPW staff. This chapter's best management practices chart and the Appendices can be used to better understand concerns and begin potential avoidance, minimization, and mitigation efforts early on in the planning process.

Questions to ask:

- Where are the important habitat and resources on the landscape that should be avoided?
- Can trails avoid fragmenting large blocks of intact habitat?
- Can trails be concentrated with a higher density in areas with lower value for wildlife?
- Can low trail density be maintained in areas that have high value for wildlife?
- Where can trails or other habitat disturbances be rehabilitated, consolidated, or reclaimed to mitigate potential trail impacts?

> *Helpful consideration from the field:* The tools referenced here can help planners and advocates who don't have an extensive scientific background understand the outer limits of trail development in a specific area. The tools can also reduce a planner's frustration by helping them learn about wildlife management or science considerations earlier in the process, rather than after much effort has been put into shaping the specifics of a potential project.

Conduct an Evaluation of Existing Impacts. It is important at this stage for the core team to understand the geographic context of existing trails and other uses on the landscape that impact wildlife. This includes evaluating cumulative impacts to wildlife from factors other than trails, such as grazing leases, oil and gas operations, and climate change. Existing trails can be evaluated for potential improvements or maintenance work, such as new design features to enhance the user experience, trail connections, or reroutes to address resource damage. Similarly, illegal user-created routes (often called social or rogue trails) or poorly designed trails that fall within sensitive wildlife habitat should be evaluated for potential decommissioning and restoration to improve habitat and compensate for new trail disturbance.

Questions to ask:

- What is the trail density in the area surrounding the planned trail?
- What other trails are in the area? How can they connect? (see Regional Planning referred to in the Introduction and Chapter 1).
- Where are the user-created trails? What is causing them to occur (i.e., are people traveling on an undesignated path as a shortcut to the desired destination)? How can this issue be addressed?
- Can you improve access to a desired destination and decommission the unsustainable user-created trail(s)?

Consider Threatened & Endangered (T&E), Imperiled, & Declining Species. Areas with T&E species and species of national and local concern need further consideration, especially if the project doesn't require a NEPA analysis. A few useful resources for considering T&E species include CPW's T&E species list, CODEX, the USFWS tool to map federally designated critical habitat, and CPW sensitive species map.

> *Helpful considerations from the field:*
>
> - Work to keep common species common.
> - Be sensitive to overall biodiversity, taking into consideration diverse flora and fauna.

Conduct a Site Visit. Desktop analysis should be followed by a site visit to verify habitat and wildlife concerns. Conduct the site visit and evaluation with core team stakeholders, local CPW staff, a land or natural resource manager, and/or biologist to ground truth the desktop analysis information and discuss potential recreation impacts to wildlife species in the area. This analysis is more important than trying to

apply broad ecological concepts that may be true in some places, but not in others. **Use the summary checklist found at the beginning of this chapter and the chart at the end for the site visit.**

> *Helpful consideration from the field:* While on site, discuss known and anticipated habitat conditions and year-round species use of the area. Also discuss existing user impacts to establish baseline data for future monitoring. Consider if baseline ecological surveys exist or are needed for your trail site. Plan for ongoing monitoring and potential enforcement needs as part of the project development.

Points to keep in mind during the site visit:

- Identify opportunities to consolidate high-density trail networks and recreation facilities in less sensitive wildlife habitats in order to maintain recreational access, while minimizing new impacts to wildlife species and their habitats.
- Avoid fragmenting large blocks of intact habitat with new trails, such as open meadows, forest stands, riparian areas, or wetlands.
- Maintain or rehabilitate native vegetation (i.e., trees, willows, shrubs, etc.) between trails, open areas, and other sensitive sites. Consider how disturbance from trail construction might introduce non-native vegetation, and plan for the implementation of weed control as necessary. Try to use existing vegetation as a screen to reduce the distance that animals perceive recreational users to be a threat.
- Identify potential human-wildlife interactions and plan trails accordingly. Route trails away from potential high conflict areas, such as high-quality bear forage or moose habitat. Provide signage in areas of existing or potential conflict between people, dogs, and wildlife species. Monitor wildlife encounters for adaptive management (example: Jefferson County Open Space Human-Wildlife Interactions)
- Understand zones of influence and disturbance, and plan for necessary wildlife mitigation practices. Trail management can greatly reduce the zone of influence of a trail by reducing density or intensity of trails in sensitive areas.
- Recognize potential opportunities to enhance and rehabilitate degraded landscapes through restoration during trail development and construction.
- Anticipate the impacts of off-trail features like rest spots, views, water sources, and shade, and the impacts those might cause. Consideration of areas that people naturally gravitate to early in the design stage is critical. If they aren't considered early on, users may create illegal trails to gain access to these places, potentially damaging habitat.
- Identify wildlife impacts caused by dogs on- or off-leash. In addition to expanding their human's zone of influence, dogs can chase, harass, and kill wildlife, or become prey for carnivores. Consider restrictions to dogs if necessary, and leash laws to keep pets safe and minimize impacts to wildlife.
- Consider the effects of trails in the absence of recreation. Trails themselves can be a conduit for modified species travel, including invasive species, and in other cases can act as a barrier to movement for some smaller species.
- Consider which types of existing and emerging recreation are appropriate for a given trail. Technology for trail-based recreation is constantly evolving, and new types of trail use, such as E-bikes, are important to consider in the trail planning process.

Siting Considerations: Avoid, Minimize, Mitigate

Overview

The following contains best management practices (BMPs) for recreational trail planning and construction, which are intended to avoid and minimize adverse impacts to Colorado's wildlife species and their habitats. **There are no "one size fits all" rules, but this section shares effective practices that should be considered and incorporated as appropriate.** These recommendations are based on peer-reviewed scientific research focused on impacts to wildlife from human disturbance, including recreation. A full list of BMP recommendations can be found in Appendix A, and additional documents from the published literature can be found in Appendix B.

The BMP recommendations are aligned on a continuum of actions that follow the mitigation hierarchy of Avoid, Minimize, and Mitigate. Where possible, development should avoid impacts to biologically sensitive habitats. If avoidance is not possible, then measures should be taken to minimize impacts. Finally, impacts that are unavoidable or cannot be minimized should be mitigated. To balance the needs of multiple wildlife species, many trails use BMPs across the spectrum of avoid, minimize, and mitigate. For example, the trail might avoid the most threatened species, while minimizing impacts to big game, and mitigating impacts on other sensitive species.

Avoiding Sensitive Habitats

It should be noted that not all trails are built in pristine habitats, and recreational opportunities should be commensurate with the environment. Considerations should be taken for whether the potential trail sites are in urban or "primitive" settings as described in the Recreation Opportunities Spectrum. This spectrum is described in this U.S. Forest Service Primer and the Adaptation for State Lands Planning. The reality is that many land managers have jurisdiction over property that falls into multiple zones between urban and designated wilderness. One of the first outcomes for any planning process should be to decide which areas should allow human use on the landscape and which should be conserved for the protection of resources.

Minimize Impacts Case Study:
Ben's Down 'N Out, Durango

Surrounded by incredible terrain, Durango is known for its vast array of trails near town. Mountain bike trail proponents approached the City of Durango with a desire for more advanced trails, which could also serve to connect trails in the popular Horse Gulch trail system. Several potential alignments were evaluated, including creating a new trail across an undisturbed hillside. The final alignment repurposed a historic fire break, which minimized new impacts to the surrounding habitat. This met mountain bikers' desire for a different user experience while minimizing the need for additional habitat disturbance. The project is now a favorite among the area's downhill mountain bikers.

With that in mind, some sensitive species, such as certain amphibians and nesting songbirds, require minimum buffers of approximately 300 feet. Other species, such as nesting raptors or grouse, require buffer distances that range from a quarter to one full mile, or greater. *Figure 4* depicts the buffers recommended to avoid impacting certain sensitive species.

It is also recommended that trail planners and core teams establish adequate buffers between new trails and riparian or wetland habitat types. A large portion of Colorado's wildlife species utilize riparian habitat for some portion of their life history. Minimizing disturbance within these areas remains of high importance.

A Note: Small Parcel Sizes

City and County open space programs often acquire parcels that are relatively small (0.5 acres-100 acres). These are often strategic acquisitions to protect wildlife habitat and open space from fragmentation and development, or to connect and provide access to other public lands. The framework outlined in this document can be used to appropriately plan land management activities and recreational use on these parcels to accommodate wildlife habitat needs. Property-specific management plans may be the most appropriate place to outline the wildlife values that the community is interested in conserving. It may be necessary to conduct site-specific inventories and monitoring to gather data to inform implementation decisions and determine the appropriate scale for protective measures. If wildlife habitat extends to adjoining lands, this connectivity should be taken into consideration and management should be coordinated with the adjoining land managers.

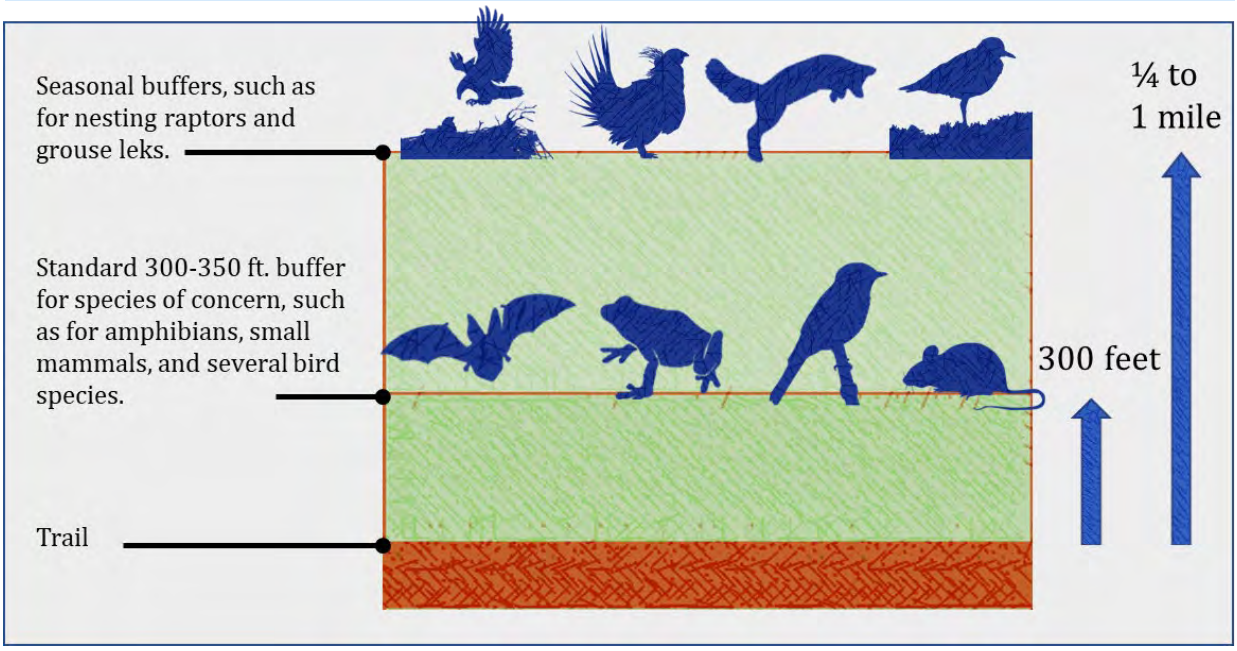


Figure 4. Buffer zones vary depending on species type.

Minimizing Wildlife Impacts

If impacts from trails cannot be avoided, consider minimization strategies. When reviewing potential trail alignments, strive to minimize habitat fragmentation by maintaining large blocks of undisturbed core habitat in the project area. One way is to redirect trails around, rather than through, areas of intact habitat (*Figure 5*). To achieve the goal of minimizing habitat fragmentation, there are three strategies to consider:

- Consolidate high density trail networks and recreation facilities in less sensitive or already disturbed habitats.
- Limit route densities within high priority habitats to an average of 1 linear mile of road or trail per total square mile for the species indicated in the best management practices table.

- **Restrictions** may also be needed, such as seasonal trail closures or dog limitations.

Depending on the existing levels of disturbance, habitat type, wildlife sensitivity, and intended trail use(s), one strategy may be more applicable than the others. For example, higher route densities may be appropriate in areas already impacted by development or located outside of high priority habitats; whereas low route density may be appropriate, or required, to maintain the effectiveness of large blocks of unfragmented or sensitive habitat areas.

To minimize wildlife impacts, it is critical to account for how proposed trails interact with blocks of habitat. Habitat is directly lost due to the development of infrastructure (e.g., roads, trails, trailheads, parking areas), and additionally through avoidance of these areas by wildlife (Sawyer et al. 2017). As route densities increase, buffer zones (zones of influence) may increasingly overlap with each other, severely reducing habitat effectiveness or eliminating wildlife habitat altogether. In other words, the cumulative effects of multiple trails and other routes with overlapping buffer zones can impact a substantially larger area compared with the habitat
loss from the routes themselves. The strategies listed above work toward minimizing buffer zone overlap to maintain functional blocks of habitat and connectivity of movement corridors.

There are two important considerations to keep in mind with route density:

- Site-specific factors, such as topography, may influence the quality of habitat, and are not accounted for in the calculation for route density.
- Route density calculations do not necessarily account for how trails are spatially distributed across the landscape (*Figure 6*).

Seasonal Wildlife Closures Case Study: Jefferson County Open Space

Jefferson County uses seasonal wildlife closures in their parks to protect species at sensitive times in their life cycles. Seasonal wildlife closures apply to all park visitors and all types of visitation. Jeffco Open Space staff use applicable Federal, State, and local laws and guidelines, as well as knowledge of wildlife populations to delineate closure areas and time periods. Closures are put into place in response to conditions on the ground to protect sensitive species, especially considering the high levels of use on Front Range trails. Jeffco Open Space Natural Resources staff and wildlife monitoring volunteers monitor local conditions during closures and adjust as needed.

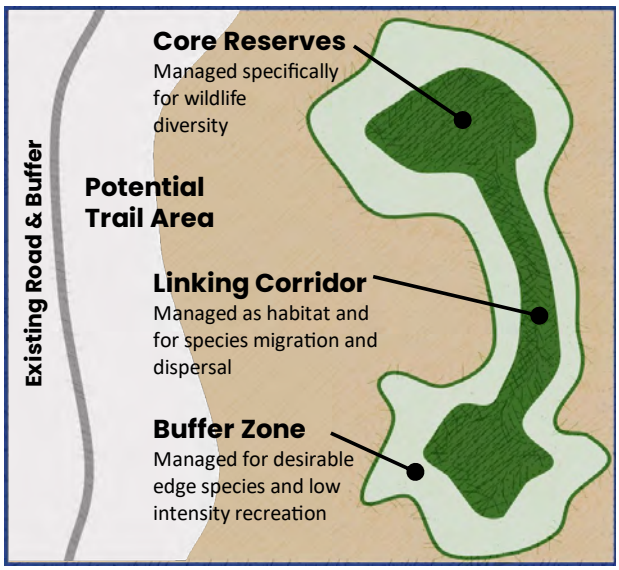


Figure 5. *An example of unfragmented habitat. Core habitat is farthest away from any disturbance and is typically managed for wildlife. Buffer zones surround core habitat and may be managed for low-intensity recreation. Whenever possible, medium to high-intensity disturbance should be located beyond the buffer zone. (Adapted from NRCS.)*

The overarching intent of the route density consideration is to minimize habitat fragmentation and loss of habitat functionality for wildlife. It is important to note that this consideration is meant as a starting point for conversation about how to minimize wildlife impacts, and is not regulatory in nature. Also, route density only applies to specific high priority and sensitive habitats and species – there are many areas in the state where it isn't (see Appendix B for more detail). Consultation with local agency staff and on the ground evaluation of the habitat are important to avoid any misapplications of route density. Remember that these strategies are part of a larger suite of BMP recommendations; it's always important to consider how other strategies can be applied to minimize and/or mitigate impacts on wildlife.

Figure 6. *The spatial component of trail density. These two images have identical trail densities. The image on the right shows how consolidating trails can be an important consideration to achieve the goal of minimizing habitat fragmentation.*

Mitigating Wildlife Impacts

Not all impacts to wildlife from a proposed project can be avoided. For unavoidable residual impacts, consider working with local CPW staff to design and implement habitat mitigation strategies. If impacts to T&E species are unavoidable, further consultation with USFWS will most likely be required. Options to restore or enhance wildlife habitat may include:

- Decommissioning and reclaiming illegal user-created trails to enhance and/or reconnect habitat.
- Enhancing habitat through mechanical vegetation treatments, noxious weed management, wetland restoration, and reseeding and planting native vegetation.
- Removing unnecessary fencing within or near the project area that pose a threat to wildlife, such as abandoned grazing fences. When new fencing is necessary, such as around new parking areas or trailheads, use the CPW's Fencing with Wildlife in Mind specifications.
- Contributing to a larger scale habitat project or land acquisition to protect and conserve wildlife habitat.

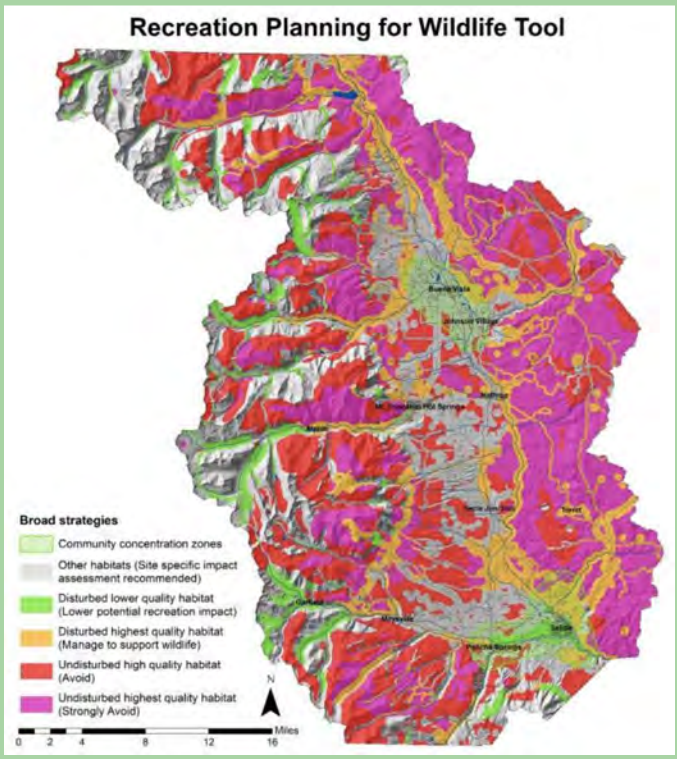
Enhance Wildlife Habitat Case Study: Denver's Central Park Westerly Creek

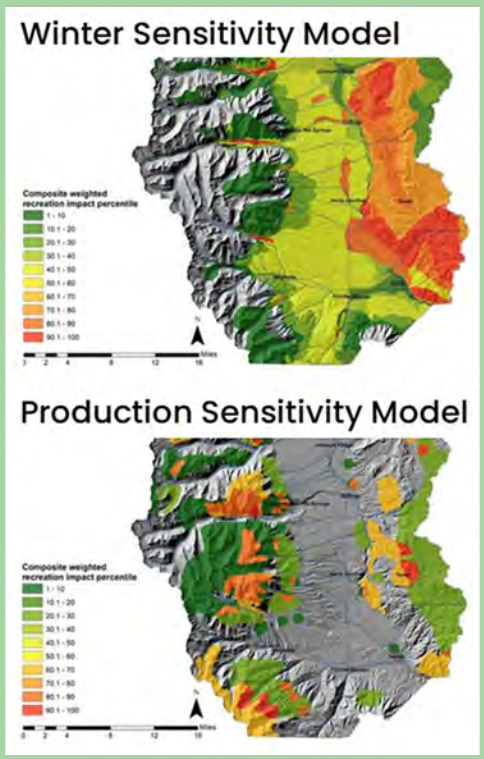
Even in an urban setting, wildlife habitat can be improved. One approach is for trail planners to seek out opportunities to restore or enhance habitat in already impacted areas during the planning process. Planners in Denver's Central Park neighborhood planted native vegetation. In addition, "large concrete chunks [from the former Stapleton International Airport] were used like stones to line the hike and bike trails and retain the soil of low rolling slopes around the bridge. The concrete slabs look amazingly 'natural' — almost like stone rockfalls…. The beauty of the Westerly Creek Trail makes it a local favorite" (Westword, 2010). This created habitat is featured along the creek in the urban park and is popular for birding. Although this area will never be a pristine habitat, the park allows visitors to experience a direct connection to nature in the middle of Colorado's largest metro area.

Envision Chaffee County Case Study

Envision Chaffee County and the Chaffee Recreation Council created an all-lands management plan to address the community-identified need of balancing the health of the natural environment with the abundant opportunities for recreation that the area offers. To inform this plan, the two groups designed and implemented a recreation survey, which indicated broad support from both residents and visitors for prioritizing environmental health over the recreation experience, and for land managers to implement new management actions to support the needs of wildlife and their habitat. After assessing current wildlife trends and finding 65% of indicator species populations to be in decline, the Council and community set a goal to stabilize, and ideally reverse, these trends.

To start, they asked, "Can we create a recreation suitability tool that helps to protect wildlife as recreation grows, and will it be useful to groups in the community as they plan management actions and potential new recreation development?" Using a framework similar to their community wildfire protection plan, they compiled species and habitat data and used geospatial modeling to get a picture of the cumulative potential impacts of recreation on 44 species of wildlife and their unique habitats. Data was adjusted for species lacking precise or up-to-date mapping to maximize the tool's efficacy. Envision also evaluated and mapped existing disturbance intensity from recreation and development. By combining these two maps created a Recreation Planning for Wildlife Tool (below). This tool won't replace site-specific analysis but will help identify the following: undisturbed sensitive habitats that should be avoided; important habitat with existing disturbance in which management can help minimize or mitigate any further impacts; and low sensitivity or highly disturbed areas in which recreation development would be most suitable.





Summary of Avoid-Minimize-Mitigate Recommendations

The recommendations within this chart represent suggested best management practices for avoidance, minimization, and mitigation actions to protect wildlife, wildlife habitats, and the safety of recreationists during the trail siting, design, and approval processes. The species included below do not capture all of the wildlife species that may be impacted by trails. Refer to Appendix A for more detailed species-specific recommendations.

	Avoidance	Minimization	Mitigation
 **Big Game Species** Bighorn Sheep, Elk, Deer, Pronghorn, and Mountain Goats	• Avoid locating new trails within CPW-mapped production areas, migration corridors, and winter range habitats.	• Limit trail densities (including existing trails) to less than one linear mile of trail per total square mile, within production areas, migration corridors, and winter range habitats. • For trails within production areas or winter range habitats, implement seasonal timing restrictions for all trail users. • For trails within winter range, production areas, summer concentration areas, and in moose habitat, restrict dogs or implement and enforce year-round dog-on-leash restrictions. • Post signage to prohibit feeding and harassment of big game. • Within moose habitat, post signage to protect human safety.	• Decommission and reclaim routes in sensitive habitats • Perform habitat enhancement projects. • Remove and/or replace old fencing that is hazardous to wildlife.

	Avoidance	Minimization	Mitigation
 **Grouse Species** Greater Sage-Grouse, Gunnison Sage-Grouse, and Columbian Sharp-Tailed Grouse	• Avoid locating new trails within 0.6 miles of Columbian Sharp-tailed Grouse lek sites, and within 1 mile of Sage Grouse (Greater and Gunnison) lek sites. • Avoid trails in priority habitat for Greater Sage Grouse.	• Limit trail densities (including existing trails) to less than one linear mile of trail per square mile on average. • Columbian Sharp-Tailed Grouse: For trails within winter range, implement seasonal timing restrictions for all trail users from Nov. 15 – Mar. 15. For trails within production areas, implement seasonal timing restrictions for all trail users from March 15 through July 30. • Greater Sage-Grouse: For trails within 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. • Gunnison Sage-Grouse: For trails within production areas and within 4 miles of a lek site, implement seasonal timing restrictions for trail users from March 1 through June 30.	• Avoidance is recommended for grouse leks; Mitigation of impacts has proven to be unsuccessful. • Trail/route decommissioning and rehabilitation in grouse production habitat. • Fence removal or marking to reduce collisions in grouse priority, production, and winter range habitats. • Habitat enhancement, including pinyon-juniper mastication, planting sage brush, and weed control in grouse habitats.

	Avoidance	Minimization	Mitigation
 **Large Carnivores** Black Bears, Lynx, Coyotes, Mountain Lions	• Avoid trail/route placement and habitat fragmentation within identified lynx linkages to maintain landscape connectivity. • 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.	• Limit trail/route densities to less than one linear mile of trail per square mile on average within high-quality Canada lynx habitat. • Implement seasonal trail closure of winter-based recreation trails (skiing, snowmobiling) on May 1 annually within high-quality lynx habitat to protect denning areas. • 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 motorized off-trail over-the-snow activities within high-quality lynx habitat. • Install certified bear-proof trash receptacles at trailheads, campgrounds and other recreation facilities within black bear habitat. • Implement CPW Camping and Hiking in Bear Country recommendations and practices. • For new and existing trails within areas that have known human-coyote interactions, implement year-round dog-on-leash regulations. • For trails within mountain lion habitat, post signage to inform trail users *and* implement and enforce year-round dog-on-leash regulations.	• Reduce route density by obliterating and reclaiming redundant routes, and by consolidating routes where possible.

	Avoidance	Minimization	Mitigation
 **Raptors and Other Avian Species**	• Avoid new trail construction and human activity within designated buffers of known raptor nest locations and production areas, in T&E or special concern species production areas, and in USFWS designated critical habitats. • Avoid removal or disturbance of key plants such as willow patches, boxelder, and cottonwood stands important to specific species.	• For any project within designated critical habitat, or with potential impact to species protected under the Migratory Bird Treaty Act, consult with the U.S. Fish and Wildlife Service to obtain necessary approvals for federally listed species. • Implement seasonal trail closures between specific dates (see Appendix A) in nesting and production areas for raptors, threatened & endangered, or species of special concern. • Implement weed control measures to prevent invasive species establishing in riparian areas. • Consult with local CPW field staff to determine if pre-construction field surveys are needed to identify breeding and production area habitats for threatened and endangered species.	• Avoidance of nests is recommended; mitigation for nesting raptors and other avian species is typically unsuccessful. • Consult with CPW and USFWS regarding impacts and potential mitigation for federally listed threatened and endangered species. • Implement dog-on-leash rules and utilize signage to keep users and dogs on trails to avoid disturbance to ground nesting birds.

	Avoidance	Minimization	Mitigation
  **Small Mammals** Bats, Black-footed Ferrets, Prairie Dogs, Foxes, Mice	• New Mexico and Preble's meadow jumping mouse: Prohibit new trail construction within 300 feet of the ordinary high-water mark of any stream within their overall range. • Townsend's Big-eared Bat, Mexican Free-tailed Bat, *Myotis* species: Prohibit new trail construction within 350 feet of the cave or mine entrance for any known winter hibernacula (site where hibernation activity occurs). • Black-footed Ferret: Prohibit dogs entirely within known black-footed ferret habitat or release sites. Dogs can transmit diseases that are lethal to ferrets.	• Gunnison's and white-tailed prairie dog: Implement seasonal timing restrictions for all recreational users from March 1 through June 15 within their overall range. • Black-footed Ferret: Consult with local CPW field staff for trail projects within mapped ferret release sites. Where deemed necessary, implement seasonal timing restrictions for all recreational users from May 1 through September 1. • Swift Fox: Implement seasonal timing restrictions for all users from March 15 through June 15 within 0.25 miles of active swift fox den sites.	• Habitat enhancements.

	Avoidance	Minimization	Mitigation
 **Riparian and Aquatic Species** Boreal Toads, Leopard Frogs, Native Fish	• Boreal Toad: Consult with local CPW field staff to identify and avoid specific breeding sites. Prohibit trail construction within 300 foot of breeding sites and wetland ponds. • Avoid native grass removal and clear-cutting of trees in wet meadows and riparian areas. • Avoid touching or handling amphibian species to prevent spread of disease among populations. • 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 work or disturbance in any perennial stream or river during fish spawning timeframes. Consult with the local CPW aquatic biologist to determine species present and spawning times.	• Boreal Toad: Limit tree removal and minimize trail width, winter grooming, and snow compaction in boreal toad range. • Northern Leopard Frog: Maintain a 300-foot buffer around Northern Leopard Frog breeding sites (emergent marshes). • To prevent the spread of disease organisms and aquatic nuisance species during construction in wet waterbodies or riparian/wetland habitats, disinfect all equipment (e.g., waders, boots, shovels, etc.) before *and* after commencing work. Use a CPW-approved disinfectant and cleaning method (see "Quaternary Ammonia Compound Disinfection Protocols"). • Consider signage to educate about sensitive species in area. • 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 or bank/shoreline erosion. • For trails adjacent to wetlands, implement year-round dog-on-leash regulations. • Consider installing foot bridges, log stringers, or stepping stones to cross streams. This will avoid stream bank erosion and stream sedimentation that is typically associated with fords. • Construct all crossings at right angles to the stream.	• Habitat enhancements.

Considering Human Dimensions

Overview

What do we mean by "human dimensions"? The term human dimensions refers to how and why humans value natural resources, how humans want resources managed, and how humans affect or are affected by natural resource management decisions. Human dimensions inquiries strive to understand human traits and how to incorporate that understanding into management planning and actions. Work from the National Park Service discussing wildlife habituation near National Parks highlights the critical importance of integrating human dimensions and biological research to effectively manage this and similar issues.

The human dimensions of natural resource management include:

- The driving forces behind people's decisions.
- The human behaviors that lead to change.
- The effects of change on natural resources and quality of life.
- The management strategies to address change.

Specific to trail use, some research has documented that recreationists' perception of the intensity of their own impacts is low compared to studies quantifying their actual impacts. Surveys have shown recreationists held members of other user groups responsible for stress or negative impacts to wildlife rather than holding themselves and other members of their own recreational user group responsible (Taylor and Knight 2003). This belief that their own personal use is benign and that wildlife impacts are caused by other user groups can lead to a resistance to supporting wildlife related trail management measures. Signage, education programs, and personal interactions between staff/volunteers and trail users can foster understanding of and appreciation for natural resources, as well as encourage visitor behavior that protects wildlife, habitat, and the trail. Appropriate messaging for communication with trail users should be positive to increase user buy-in and to create a welcoming experience for visitors both at the trailhead and on the trail. Messages should include actions users can make to be part of the solution to protect our resources (e.g., stay on the trail, pack out your trash, leave no trace). The human dimension needs to be explored and understood during regional planning processes to inform potential trail projects at both a trail/site-specific and landscape scale.

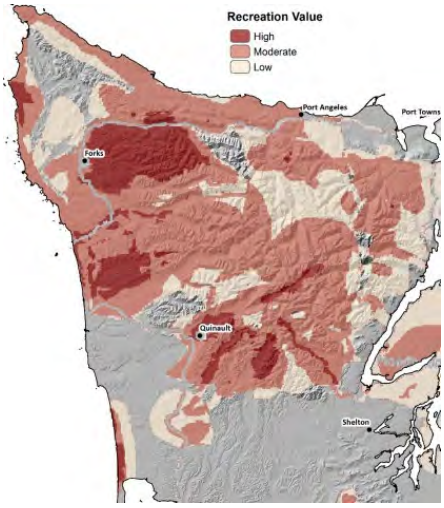
Questions to ask:

- How can potential projects both meet the recreational desires of a community and enhance their understanding of the importance of wildlife and conservation measures?
- What specific efforts can be undertaken with members of the public to help them understand their impact on wildlife when they recreate?
- How can that understanding be utilized to improve compliance with management strategies such as seasonal closures?

As the NPS points out, human values regarding wildlife interactions change over time and will continue to evolve. Human dimensions should be considered alongside biological considerations. They should be conveyed to the public during the outreach and communication phase.

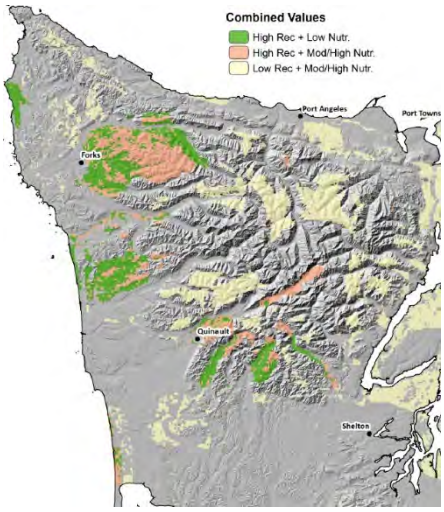
Examining Opportunities and Trade-Offs

How can the two values of wildlife and recreation be evaluated across the landscape? One approach comes from Mike Wisdom, a wildlife biologist from the USFS Pacific NW Research Station, who suggests utilizing spatial mapping tools to compare the two values directly. Wisdom suggests mapping recreational values in terms of desires for new trails, then ranking them by importance – High, Moderate, and Low Value – based on the consensus of the community. Wildlife areas can be mapped similarly and ranked as High, Moderate, and Low Value based on the importance of the habitat to a species. In this study, nutritional value, or the potential of any given habitat to provide adequate food resources, was used to assess the value of habitat.



When putting those two data sets together, planners can begin to compare them by looking at the combined values of recreation and habitat. Areas with high recreation and low habitat value are potential opportunities for trail systems with a high mileage density. Areas with low recreation and high habitat value provide opportunities to protect wildlife habitat by avoiding sensitive areas, limiting trail use to existing systems, and identifying areas to expand or enhance habitat through restoration projects. Areas with high-moderate values of both recreation and wildlife require more attention to determine where trails might be compatible with wildlife and where they should be avoided. These determinations can be assessed by performing site specific analysis using the best practices in this document.

This model can provide a powerful initial overview of the landscape to find easy areas of compatibility that may already exist. It does not identify definitive answers in every case, but it can highlight areas where a win-win situation exists for both recreation and wildlife, as well as the areas where a more focused discussion is needed. It also allows planners to visually express the information to stakeholders, thus increasing the opportunity for collaboration as discussed in Chapter 1.

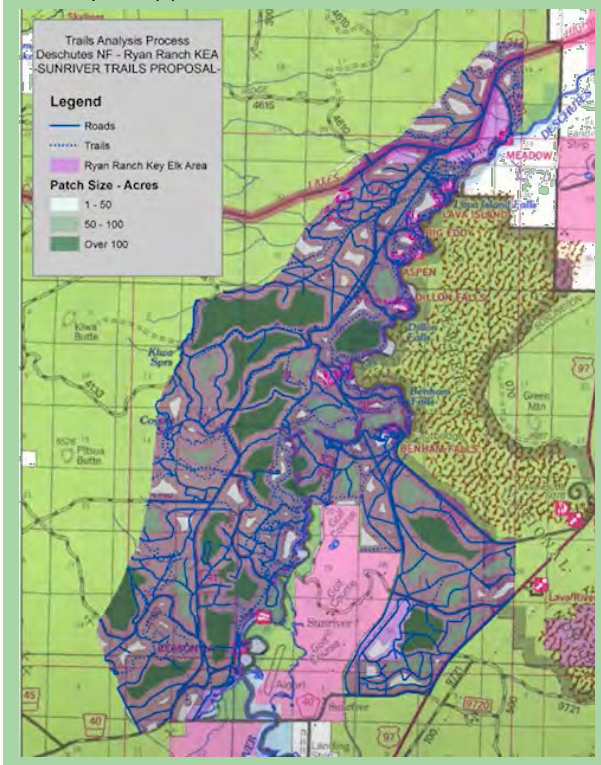


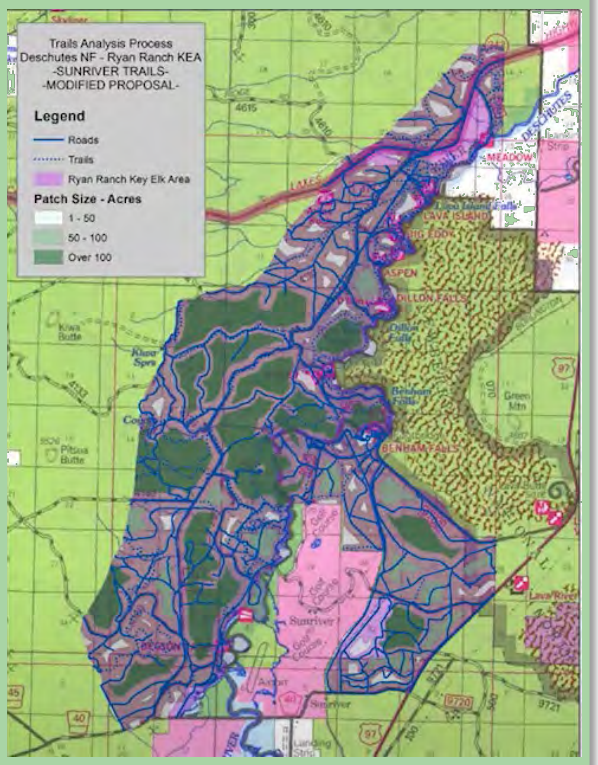
Ryan Ranch Key Elk Area - Sunriver Trails

A real-world example of land managers using this type of data to find solutions comes from the Deschutes National Forest. The Forest Service was asked to evaluate a proposed 10-15 miles of new mountain bike trails about eight miles southwest of Bend, OR. This area has both a high wildlife value (elk habitat) and a high recreational value (established mountain bike trail system). Forest Service wildlife biologists conducted an analysis of the existing habitat and proposed trail alignment, and submitted an alternative alignment proposal focusing on three things:

1. Maintain large patches of core habitat.
2. Consolidate new disturbance into existing disturbance corridors.
3. Reconnect small and medium patches to build larger patches of habitat with some additional restoration work to improve those patches.

After modifying the proposed alignments to better achieve these goals, the result was a 40% increase to core elk habitat and the construction of 10 miles of new trails. These trails provide connections between the local community and the broader mountain bike trail system. They also enhance the variety of opportunities for different skill levels.





Chapter 3: Plan for Trail Management and Monitoring

Chapter Focus: Once a decision is made about where to locate a trail, it is time to address management of use on the trail. This chapter (like the others) does not seek to offer a prescription, but instead provides resources, recommendations, and the overall guidance land managers need to further protect wildlife through trail management and monitoring. *Figure 7* provides a summary of trail management types. Chapter 3 covers Visitor Education, Adaptive Management Techniques, and Enforcement. Use Limitations and Infrastructure, Design, and Maintenance were covered in Chapter 2.

Figure 7. Wildlife trail management types: *Different management techniques can be used, depending on species and proximity to sensitive wildlife.*

Monitoring

Establish Wildlife Baselines When Feasible. For ecological monitoring to be effective, baselines must be established prior to trail construction. Monitoring only at the end of the planning process greatly reduces its efficacy. This starts with an effective initial evaluation (see Chapter 2) by the core team to establish baselines, and a plan for ongoing monitoring to ensure resources remain in a healthy state. Baselines in this case refer to current conditions, including existing impacts, and not to conditions that would exist without any human impacts.

Be Discerning About Who Completes Monitoring. To increase buy-in from all stakeholders, monitoring should be driven by an interdisciplinary group of agency staff and wildlife and recreation interests. This process can encourage mutual trust between stakeholders and allow groups to verify monitoring data. Not all agencies have a funding source for extensive monitoring, so establishing monitoring partnerships with appropriately trained local volunteers may be a key to achieving success.

Visitor Education

Incorporate Visitor Education Needs. Where feasible, choose easy to understand management strategies and/or align with nearby strategies. This knowledge should complement messages that might come from a user's own advocacy group. The following sources can provide additional messaging guidance: Leave No Trace, Stay the Trail, Tread Lightly, NOHVCC Great Trails, and International Mountain Bicycling Association. Consider education and outreach methods that can adapt with changing management strategies (such as the trails application COTREX). It's also important to consider diverse learning styles. As such, planners should consider how to use accessible and diverse modes of visitor education.

Anticipate Conflicts Between Users. Understanding potential types of conflict between recreational users may help address requests to create more trails. It may also help to address trail density concerns. Education of users on multiple use can sometimes remedy conflicts and reduce the public requests for additional trails. Trail users perceive that other user groups have more of an impact on the environment and wildlife, whereas studies suggest that all users have similar impacts when they stay on formal trails. According to Hennings (2017), **actions that may decrease user conflicts include**:

- Encourage positive interaction among trail users; their values are likely more similar than different. Positive interactions both on and off the trail can break down barriers and stereotypes and build

Stay the Trail Case Study

The idea for Stay the Trail first came about in 2003 after a group of Off-Highway Vehicle (OHV) enthusiasts recognized a need to educate the public on responsible OHV use and to develop a sense of stewardship for public lands among OHV recreationists. They released their first brochure in 2005. Since then, they have greatly expanded their education and outreach capacity, reaching users throughout the year and across the state through educational programs, stewardship projects, direct user contacts, and trail map services. Stay the Trail operates in partnership with a wide spectrum of stakeholders, from individual OHV enthusiasts and local clubs to state and federal land management agencies like BLM and USFS. Their traveling trailers are the cornerstone of their program and can be found throughout the state during the summer months at trailheads. The trailers help spread their message to always stay on designated routes to protect surrounding habitat, and to respect wildlife when encountering them by slowing down to allow animals plenty of room.

understanding, good will and cooperation. One example is to bring the different types of visitors together for joint trail building or maintenance projects.

- Use the most "light-handed" management approaches possible that will still achieve objectives. This is essential to providing choices in natural environments, which are so important to trail-based recreation.
- Actively and vigorously promote trail etiquette; target the audience, get the information into users' hands as quickly as possible, and present etiquette in simple, interesting, understandable and sometimes lighthearted or humorous ways.
- Monitor the ongoing effectiveness of programs implemented. It is essential to evaluate the effectiveness of the actions designed to minimize conflicts; provide for safe, high-quality trail experiences; and protect natural resources. Conscious, deliberate monitoring is the only way to determine if conflicts are indeed being reduced and what changes in programs might be needed. This is only possible within the context of clearly understood and agreed-upon objectives for each trail area.
- Understand the needs of present and likely future users of each trail. This is critical for anticipating and managing conflicts and requires patience, effort, and sincere active listening.
- Work with affected users (all parties involved) to reach mutually agreeable solutions. Users who are not involved as part of the solution are likely to be part of the problem now and in the future.
- Plan and act locally – whenever possible, address issues regarding multiple use trails at the local level. This allows for greater sensitivity to local needs and provides better flexibility for addressing difficult issues on a case-by-case basis. This also facilitates involvement of the people most affected by any decisions, and most able to assist in their successful implementation.
- Recognize conflict as one visitor interfering with another visitor's reasons for visiting the natural area.
- Identify potential user groups and involve them as early as possible.
- Identify actual sources of conflicts – get beyond emotions and stereotypes as quickly as possible and get to the root of any problems that exist.

Reduce Impacts on Agriculture and Ranching. Many trails in Colorado pass through private working lands and/or public land with grazing leases. Conflict can be reduced by posting signage at recreation facilities that informs users about fencing, cattle guards, and the risk of dogs-off-leash in these areas.

Vail Valley Wildlife Ambassadors and COPMOBA: Peer Education Initiatives

Trail users are becoming increasingly involved in conducting outreach surrounding seasonal trail closures. Two prominent examples of this come from the Colorado Plateau Mountain Bike Trail Association (COPMOBA) and Vail Valley Mountain Trails Alliance. In their fall newsletter, COPMOBA reminds recreationists which trails are subject to seasonal closures and why it is so important that they observe these closures. They explain the needs of wildlife, address common questions (e.g., Why is this trail closed if there's no snow? Why do closures last until spring?), and direct users to other trails in the area that are still open.

In Eagle County, recent trail development reinvigorated conversations about trails and their impact on local wildlife populations. This led to the creation of the Wildlife Trail Ambassador Program. The Vail Valley Mountain Trails Alliance (VVMTA) launched the ambassador program in the spring of 2018 after recognizing the need to proactively educate and communicate with trail users and the community about seasonal trail closure. Volunteer Ambassadors are placed at seasonally closed trailheads to enforce and educate trail users about the closure, along with *Leave **No Trace*** principles, trail etiquette, and options of where trail users can recreate during these times. Additionally, the program includes social ambassadors. These are community members who frequently interact with and inform the public of the importance of seasonal closures at events and meetings, such as hotel conferences, community groups, at outdoor retailers, and within their social networks. The VVMTA in partnership with the Eagle-Holy Cross Ranger District has installed and managed over 10 game cameras on seasonally closed trails to provide data and inform the direction and decisions of the ambassador program. From its inception through 2019, the program has logged 346 hours of volunteer time, made contact on trails and in the community with over 2,000 people. The program has expanded its coverage of seasonally closed trails to include both the spring calving and winter seasons. While the ambassadors have been beneficial by increasing user awareness around closures, it is not a complete solution itself; additional techniques still need to be employed to educate users and enforce violations.

Maintenance

As alluded to earlier in the document, the maintenance of existing trails is an important consideration for all land managers when thinking about how to provide additional capacity for statewide recreation. Properly managed and maintained trails should provide safe and appropriate use levels and can help provide additional capacity for recreation. Trail maintenance can include both trail reroutes and realignments to help avoid or mitigate resource issues as well as address visitor safety issues. New reroutes should be done in conjunction with reclamation and restoration of the old trail to encourage regrowth of native vegetation.

Trail maintenance can be needed for a number of reasons, including poor construction, poor alignment, overgrowth, and weather-related damage. These minor modifications and improvements do not need to go through the same process as new trail construction. New trails should be constructed following current best practices; this will reduce the amount of future maintenance needed.

Adaptive Management Techniques

Adaptive management is a learning process that emphasizes monitoring and flexible decision-making. Adaptive management is not an end in itself, but rather a means to achieve more effective management outcomes for both wildlife and trail users. As new research continues to come out on impacts to wildlife and effective recreation strategies, the core team should include adaptive management practices from the outset and consider monitoring plans early in the process. For example, planners can employ methods to track the use of newly constructed trails and facilities, which may include counting devices to track daily and seasonal timing of use, total number of users, and different types of recreational users. This data, based on real-time information, can be helpful in constructing a spectrum of restrictions that can be applied when necessary and can help avoid overly restrictive or not-restrictive-enough management. It's important to note that the responsiveness of adaptive management can vary, and that the planning team should consider this limitation. The Interagency Monitoring Guidebook goes into much greater depth on how to evaluate the effectiveness of visitor use management.

Trail Construction Best Practices

To limit impacts to habitat and wildlife during the trail building phase, consider Boulder OSMP's BMPs: Save topsoil for restoration, limit the import of soil with invasive seeds, consider appropriate equipment to limit impacts, use native seeds to restore disturbed areas, don't use straw erosion control (which often contains non-desirable plant species), use equipment to set up erosion control and limit sedimentation in aquatic habitat, and limit the spread of invasive species by washing equipment.

Helpful considerations from the field

- Trail counters are incredibly important to better understand the timing, frequency, and volume of use on specific trails. This data can go a long way in informing management practices.
- Where available, consider methods to track potential wildlife impacts and reactions. Track wildlife use and responses through collar data, human conflict reporting, and general observations to help discern trends through time.
- Consider monitoring and recording violations concerning trail use compliance surrounding restrictions (e.g., seasonal closures) and the creation of illegal user created trails.

Enforcement Planning

Enforcement and education planning might include responses to closure violations, illegal off-trail use, dogs off leash, and other infractions within the trail plan. It's critical to establish clear expectations for trail use, and how patterns of illegal or damaging use will lead to new levels of enforcement or adaptive management practices. Enforcement and education planning should consider current and future capacity. Planners should consider how rules and regulations will be enforced on newly proposed trails in perpetuity, for regulations, such as seasonal closures, designed during the planning process are only effective if there are adequate levels of education and enforcement.

Helpful considerations from the field

- Most conflict, impact, and damage stems from users' lack of knowledge. Education and communication are critical.
- Self-policing and reporting can be very effective methods of increasing user compliance with rules and regulations. One of the most effective methods to curb violations and illegal trail use is to create an informed public and instill a resource-friendly etiquette. Two examples of how to go about this are provided in the case studies.
- Human presence (staff, volunteer, ranger) is most important. Direct communication regarding wildlife and an outdoor etiquette/ethic, goes a lot farther than signage. You can get creative with volunteers to expand capacity.

Good OHV Management Trail Crew Projects

Funded by user registration fees from OHV users, Colorado Parks and Wildlife's OHV Good Management Program is an agreement between USFS, BLM, and CPW that was born out of a need to proactively maintain high-use, motorized recreation areas on federal lands. Good Management trail crews include two or three full-time crew members that are deployed during the summer and fall recreation seasons to take a holistic management approach that preserves riding opportunities while protecting sensitive resources. These trail crews use "best practices" to maintain and restore OHV riding areas through trail maintenance, monitoring, signing, education, and mapping. Crews also promote public safety by checking OHV operators for registration and required equipment. Although enforcement is not the main part of their job, crews working on USFS land can also cite operators and issue warnings for off-route use and other resource damage violations.

Conclusion

The land manager Task Force convened to update this document in 2020. Colorado land managers saw a glimpse into the future that summer, reporting record use numbers as people sought the outdoors as a safe outlet for mental and physical relief during the COVID-19 shutdown. A common refrain from government agencies was that weekday use looked like a typical weekend and weekend use looked like a Fourth of July holiday weekend. These unprecedented levels of use and interest by the public underscored the importance and urgency of this update.

Trails are only one piece of the puzzle, but as the most popular form of outdoor recreation in the state, we know that trails are how many Coloradans and visitors to our state connect to nature and wildlife. Land managers use trails as a tool to help them manage human use on the landscape. A mentor to well-known trail building professional Tony Boone said simply: “People don't need trails. The land needs trails.” In other words, left to their own devices, people will find a way to recreate on the landscape. Trails help us to focus on areas that can be designed to handle high usage, shifting use away from sensitive or valuable habitat.

The Task Force's goal was to create a resource for other land managers, recreational trails groups, and the public at large, providing guidance, based on our knowledge, on how to develop trail systems that meet recreational needs and address wildlife impacts. While we acknowledge that the material herein may not be perfect, it is a collection of our best practices and a document we will all strive to use within our agencies. We have created a framework for collaboration between groups, sharing ways that solutions can be found. We have provided examples from case studies that describe how trails can be designed to minimize the impacts that people have on wildlife and wildlife habitat. We hope the information can help us all make better and more informed decisions based on the sensitivity of habitat and wildlife populations.

We must continue to work cooperatively to find successful solutions that achieve a balance between protection of wildlife habitat and providing outdoor recreation opportunities. Good trail design can enhance the visitor experience, provide opportunities to enjoy the natural world, and minimize impacts on wildlife. By providing sustainable trails for recreationists to enjoy outdoor experiences, users are more likely to become advocates in our efforts to protect our state’s natural resources.

“The most important thing is getting rid of the myth that increasing visitors and protecting resources are incompatible,” said Dale Blahna, former USFS research social scientist in an article in The Wildlife Professional (Learn 2020, p. 25). “That belief actually hinders creative applications that could meet both goals – allowing public access and protecting resources simultaneously.” This document represents our attempt to ask Coloradans to work together on the mutually dependent goals of recreation and conservation.

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.

Appendix B. Supporting Documentation from the Published Literature

Introduction

These resources were compiled by Colorado Parks and Wildlife staff and are a collection of the best available science concerning trail-based recreation impacts on wildlife and their habitats. The majority of this information is presented in the main body of the document at a big-picture level. The more detailed resources contained herein may be of use to those in the trail planning process grappling with species-, habitat-, or season-specific considerations.

List of In-Text Citations

Hennings, L. (2017). Hiking, mountain biking and equestrian use in natural areas: A recreation ecology literature review (Portland, OR: Metro Parks and Nature).

Learn, J.R. (2020). A delicate balance: Managing wildlife and visitors on public lands. Wildl. Prof. 14, 18-27.

Sawyer, H., Korfanta, N.M., Nielson, R.M., Monteith, K.L., Strickland, D. (2017). Mule deer and energy development—Long-term trends of habituation and abundance. Glob Change Biol. 23, 4521-4529. https://doi.org/10.1111/gcb.13711

Taylor, A.R., and Knight, R.L. (2003). Wildlife responses to recreation and associated visitor perceptions. Ecol. Appl. 13, 951-963.

List of Additional Resources

CPW Species and Associated High Priority Habitat Recommendations – Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado.

Sustaining Wildlife with Recreation on Public Lands – General Technical Report from the United States Forest Service that is a synthesis of research findings, management practices, and research needs concerning recreational impacts on wildlife.

Current Literature List – Collection of the best available science on this topic. Some of these studies are not based in Colorado, but they focus on wildlife, habitats, and ecosystems that also exist in our state.

CPW Route Density and Lynx Primer – A synthesis of the literature pertaining to wildlife avoidance behavior, displacement distance, and zone of influence, and how these support route density recommendations. Also includes a synthesis of the most recent lynx research.

Appendix C. List of Resources

List of Resources Linked in the Planning Trails Document

- Adapting the USFS Recreation Opportunity Spectrum for States Lands
- BLM Guidelines for a Quality Trail Experience
- Colorado Conservation Data Explorer (CODEX)
- Colorado Ownership Management and Protection (COMaP)
- Colorado Outdoor Partnership
- Colorado Outdoor Principles
- Colorado State Wildlife Action Plan
- Colorado Trail Explorer App (COTREX)
- CPW Fencing with Wildlife in Mind
- CPW Species Activity Mapping Tool
- Interagency Visitor Use Management Council Monitoring Guidebook
- International Mountain Bicycling Association Managing Mountain Biking Guide
- Jefferson County Human-Wildlife Interaction Reporting Tool
- Leave No Trace Principle for Respecting Wildlife
- Resilient Land Mapping Tool
- Resilient and Connected Network
- State of Colorado Community Partnership Principles Guide
- Stay the Trail
- Tread Lightly
- USFS Recreation Opportunity Spectrum Primer
- Visitor Capacity Guidebook

Other Resources

- *Five Critical Elements of Trust in Collaborations, Wellstone Collaborative Strategies*
  An overview of the five foundational aspects of trust in successful collaborations.
- *Rocky Mountain Region Trails Strategy, USDA*
  A strategic approach to trails that guides how people work together to share, steward, and enjoy a sustainable system of trails across the Rocky Mountain region.
- *Site-Specific Trail Development Process Worksheet, BLM Grand Junction Field Office*
  A fillable PDF to walk people through the BLM ten-step trail development process for planning, designing, constructing, maintaining, and monitoring trails.
- *Trail System Planning Guidebook, National Park Service*
  A guidebook focused on big-picture thinking for larger, networked trail system planning.
- *Undesignated Trail Management and Messaging Study Report, City of Boulder OSMP*
  A study of different management approaches to reduce the use of undesignated or user-created trails.

Appendix D. Task Force Members

The Task Force members reached unanimous consensus and enthusiastic support for the document.

Name	Title	Agency
Gary Tennenbaum	Pitkin County Open Space and Trails Director	Pitkin County Open Space
Chelsea Beebe	Senior Wildlife Ecologist	Jefferson County Open Space
Bob Finch	Director of Natural Resources	Denver Mountain Parks
Chad Schneckenburger	Region 2 Trails Lead	US Forest Service
Melissa Dressen	Wildlife Biologist	US Forest Service
Neil Perry	Wildlife Biologist	Bureau of Land Management
Jack Placchi	Travel Management and Trails Coordinator	Bureau of Land Management
Ericka Pilcher	Rivers, Trails, & Conservation Assistance Program Manager	National Park Service
Anne Lowe	Open Space & Trails Manager	Town of Breckenridge
Kris Middledorf	Area Wildlife Manager	Colorado Parks and Wildlife
Brian Magee	Land Use Coordinator	Colorado Parks and Wildlife
Diane Emmons	Chief, Visitor Services and Outreach	US Fish and Wildlife Service
Amy Schwarzbach	Natural Resources Manager	Durango Parks and Recreation Department
Jarret Roberts	Visitor Infrastructure Supervisor	City of Boulder Open Space and Mountain Parks
Mel Yemma	Town Planner II	Town of Crested Butte
Emily Duncan	Trails Development Coordinator	Colorado Springs Parks, Recreation and Cultural Services
Maureen Mulcahy	Environmental Policy Planner	Eagle County

Project managed by Fletcher Jacobs (Colorado Parks and Wildlife State Trails Program), Jacob Bornstein (Wellstone Collaborative Strategies), and Matt Gray (Rocky Mountain Innovation Lab) with support from Erik Arndt and Joseph O'Brien.

Appendix E. Summary of Feedback Process and Public Comment

Throughout the development of Planning Trails with Wildlife in Mind, the land manager Task Force sought input and feedback from the public and a variety of stakeholders. In brief, this included:

1. Feb-June 2020 – Input from conservation and recreation advisory group regarding what direction the document should take, pitfalls to avoid, and structural considerations;
2. October 2020 – First draft feedback from conservation and recreation advisory group and technical advisory team via online survey;
3. January 2021 – Second draft feedback from conservation and recreation advisory group, technical advisory team, and colleagues of Task Force members via online survey;
4. February 2021 – Second draft feedback from community leaders that represent Colorado's diversity via focus groups and structured interviews;
5. March-April 2021 – Third draft feedback during public comment period via online survey.

Additional detail is provided below:

Item 1: Early on in the process we received extensive input and engagement from conservation and recreation groups. These included six advisory group discussions, Partners in the Outdoors conference session, presentations to the Sportsperson's Roundtable and Southern Rockies Conservation Alliance, 1 on 1 conversations and interviews, and individual emails provided. These engagements were summarized at length and provided to the initial rough draft writing team and the Task Force for consideration about how to approach the document. This early input helped determine which critical topics needed to be addressed during future discussions and subsequently to be included throughout this document.

Items 2 and 3: The online surveys used during Items 2 and 3 received 32 and 36 responses, respectively, which were organized by theme and presented to the Task Force for a decision on how to engage with each piece of feedback. As part of the survey, participants were able to score the document overall. The October draft received a score of 3.5 out of 5 and the January draft received a score of 4.3 out of 5.

Item 4: Focus groups and interviews were conducted with five community leaders that represent Colorado's diversity. Their feedback was similarly presented to the Task Force for a decision, and specific suggestions were incorporated throughout the document to both improve its readability and strengthen the framework for meaningful community engagement and participation.

Item 5: The public comment period for Planning Trails with Wildlife in Mind was open for 30 days, from mid-March to mid-April, and garnered 34 responses to the online survey and multiple letters from stakeholders throughout the state. As with the first rounds of feedback, responses during the public comment were organized first by chapter and second by theme, and recommendations were provided to the Task Force about how to address the different recommendations and requests.

These processes were invaluable for identifying missed opportunities, refining and strengthening the document's purpose, clarifying language, and affirming the importance and usefulness of the document. For a full summary of the public comment with responses from the Task Force, please visit this link.

Representatives from these groups provided feedback during advisory meetings and surveys:

Feedback was sought from the people and organizations in the list below. While this does not necessarily indicate their support or endorsement, we extend our appreciation for their time.

- Backcountry Hunters and Anglers
- City of Trinidad Parks and Recreation Advisory Committee
- Colorado Fourteeners Initiative
- Colorado High-Country Education Treks
- Colorado Mountain Bike Association
- Colorado Mountain Club
- Colorado Natural Heritage Program
- Colorado Plateau Mountain Bike Trail Association
- Colorado Snowmobile Association
- Colorado Youth Corps Association
- Environmental Learning for Kids
- Envision Chaffee County
- ERO Resources
- Great Old Broads for Wilderness
- Great Outdoors Colorado
- Gunnison Trails
- Headwaters Trails Alliance
- International Mountain Bicycling Association
- Keep it Colorado
- Metro Denver Nature Alliance
- Mile High Youth Corps
- National Forest Foundation
- Nature Kids/Jóvenes de la Naturaleza
- Outdoor Recreation Industry Office
- Rising Routes
- Roaring Fork Mountain Bike Association
- Roaring Fork Outdoor Volunteers
- Rocky Mountain Elk Foundation
- Rocky Mountain Field Institute˝
- Rocky Mountain Recreation Initiative
- San Luis Valley Great Outdoors
- Southwest Conservation Corps
- Sportsperson's Roundtable
- State Trails Committee
- The Wilderness Society
- Thunder Mountain Wheelers
- Trails Preservation Alliance
- Volunteers for Outdoor Colorado
- Wild Connections
- Wildlands Restoration Volunteers