

1 DRAFT ENVIRONMENTAL IMPACT STATEMENT
2 COLORADO GRAY WOLF 10(j) RULEMAKING
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EXECUTIVE SUMMARY

This draft environmental impact statement (EIS) analyzes the U.S. Fish and Wildlife Service’s (Service) proposed action to address a request from the State of Colorado to designate wolves reintroduced into Colorado as an experimental population under section 10(j) of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [USC] 1531 et seq.). The section 10(j) designation would provide management flexibility to the state for the reintroduction and management of the gray wolf (*Canis lupus*). On November 3, 2020, Colorado voters approved Proposition 114 (codified as Colorado State statute 33-2-105.8), a citizen-initiated ballot measure requiring the Colorado Parks and Wildlife (CPW) Commission to create a plan to reintroduce the gray wolf to a portion of the species’ historical range in Colorado by the end of 2023. As part of the reintroduction process, CPW requested the Service designate the reintroduced gray wolf population as experimental under section 10(j) of the ESA. Designating the population as experimental would allow the Service to tailor ESA protections for the population to provide management flexibility and better address stakeholder concerns.

PURPOSE AND NEED FOR ACTION

The purpose of this action is to provide management flexibility for the State of Colorado in its efforts to reestablish a population of gray wolves in a portion of the species’ historical range in Colorado and to further the conservation of the species. This reintroduction effort is a result of Colorado State statute 33-2-105.8, passed on November 3, 2020, which directs the CPW Commission to develop a plan to introduce gray wolves to Colorado.

Currently, the gray wolf is listed as endangered under the ESA in Colorado. To facilitate reintroduction efforts, the State of Colorado has requested the Service designate the reintroduced population as an experimental population under section 10(j) of the ESA. This designation would reduce the regulatory impact of reintroducing a federally listed species in a specific geographic area (an experimental population boundary). This EIS evaluates the use of the 10(j) process for this reintroduction.

PROPOSED ALTERNATIVES

Three alternative approaches for the proposed regulatory framework were chosen for analysis in the EIS:

1. No-action alternative – Take no federal action to provide management flexibility to CPW; allow State reintroduction of the gray wolf as a federally listed endangered species in Colorado
2. Alternative 1 – Provide CPW management flexibility and provide for conservation of the species by approving a section 10(j) rule for any gray wolf living in, or reintroduced to, the State of Colorado
3. Alternative 2 – Provide CPW management flexibility and provide for conservation of the species by approving a section 10(j) rule for the gray wolf in a limited territory and issuing a permit under section 10(a)(1)(A) for the gray wolf population outside the designated experimental population boundary in the state of Colorado

The three alternatives addressed in the EIS were developed during internal scoping. The two action alternatives are consistent with section 10 of the ESA. The Service developed alternative 2 to manage reintroduced wolves and any established, pre-existing wolf populations in the State, should they occur, consistent with section 10 of the ESA. The term “population” is defined in section 2.3.2 of the EIS. The no-action alternative, is included in compliance with Council on Environmental Quality regulations implementing the National Environmental Policy Act (40 Code of Federal Regulations 1502.14[c]). The no-action alternative considers implementation of the State’s plan subject to restrictions under section 9 of the ESA. Under the no-action alternative, the Service would not issue a section 10(j) rule or section 10(a)(1)(A) permit and would continue to manage gray wolves in Colorado as an endangered species under the ESA. The alternatives are summarized in table ES-1.

1 **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

2 The draft EIS analyzes the potential environmental consequences of alternatives that would implement the
3 proposed action to develop a regulatory framework at the request of the State of Colorado assisting in its wolf
4 reintroduction program. The analysis in the EIS compares the potential impacts of the action alternatives
5 (alternatives 1 and 2) to conditions under the no-action alternative. The no-action alternative recognizes that the
6 State of Colorado can move forward without a regulatory framework from the Service and considers the impacts
7 of the reintroduced population managed as an endangered species under the ESA. Table ES-2 summarizes the
8 impacts of these alternatives to special status species, other wildlife, Tribal resources, socioeconomics, and
9 environmental justice concerns.

1 **Table ES-1. Comparison of Alternatives**

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Regulatory Framework Used	All ESA protections apply.	Section 10(j) throughout entire state of Colorado	If an existing population is documented before a 10(j) rule is finalized, the area (as defined by the Service) with the existing population would have a section 10(a)(1)(A) permit in a portion of Colorado (for analysis purposes. This alternative is based on the following State of Colorado Big Game Management units: 161, 6, 7, 16, 17, and 171). An experimental population boundary would be established for the remainder of the state outside this area.
Listed status of wolves	Endangered	Threatened	Threatened within the experimental population boundary. Endangered in area covered under section 10(a)(1)(A) permit.
Consultation (per section 7)	Required in all instances.	Not required unless those actions are on lands of the national park system or the national wildlife refuge system (16 USC 1539).	Within the experimental population boundary, not required unless those actions are on lands of the national park system or the national wildlife refuge system (16 USC 1539). Required in areas covered by the section 10(a)(1)(A) permit.
Take in self-defense	Any person may take a gray wolf in defense of the individual's life or the life of another person.	Same as the no-action alternative.	Same as the no-action alternative.
Agency take of wolves determined to be a threat to human life and safety	The Service or designated agent(s) may promptly remove any wolf that the Service or designated agent(s) determines to be a threat to human life or safety.	Same as the no-action alternative.	Same as the no-action alternative.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Non-injurious take of problem wolves by private landowner or grazing permittee	Any person may conduct opportunistic harassment of any gray wolf in a non-injurious manner at any time. Opportunistic harassment must be reported to the Service or designated agent(s) within seven days.	Same as the no-action alternative.	Same as the no-action alternative.
Injurious, nonlethal take of problem wolves by private landowner or grazing permittee (e.g., through use of less-than-lethal munitions)	No lethal or injurious nonlethal take would be permitted.	After the Service or designated agent(s) has confirmed wolf activity on private lands, on a public land-grazing allotment, or on a Tribal reservation, the Service or designated agent(s) may issue written take authorization valid for not longer than one year, with appropriate conditions, to any landowner or public land permittee to intentionally harass wolves. The harassment must occur in the area and under the conditions as specifically identified in the take authorization.	Same as alternative 1.
Taking of wolves “in the act” of depredation on private land	No lethal or injurious nonlethal take would be permitted.	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock, stock animals, or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals, or dogs were wounded, harassed, molested, or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.	Within the experimental population boundary, take of wolves “in the act” of depredation on private land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Taking of wolves “in the act” of depredation on public land	No lethal or injurious nonlethal take would be permitted.	Any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may immediately take a gray wolf in the act of attacking his or her livestock on the person’s allotment or other area authorized for his or her use without prior written authorization, provided that the producer or permittee provides evidence of livestock recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock were wounded, harassed, molested, or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule. Any person legally present on public land, except land administered by the NPS, may immediately take a wolf that is in the act of attacking the individual’s stock animal or dog, provided conditions noted in “taking of wolves in the act on private land” are met.	Within the experimental population boundary, take of wolves “in the act” of depredation on public land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
“Shoot on sight” of problem wolves for private landowner	No lethal or injurious nonlethal take would be permitted.	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals or dogs were wounded, harassed, molested or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.	Within the experimental population boundary, shoot on sight of problem wolves for a private landowner would be the same as alternative 1. Within the 10(a)(1)(A) area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
“Shoot on sight” of problem wolves for a grazing permittee	No lethal or injurious nonlethal take would be permitted.	At the Service’s or designated agent(s) direction, the Service or designated agent(s) also may issue a shoot-on-sight written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take problem wolves on that permittee’s active livestock grazing allotment if: (1) the grazing allotment has at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent(s) within the past 30 days, and (2) the Service or designated agent(s) has determined that problem wolves are routinely present on that allotment and present a significant risk to the health and safety of livestock, and (3) the Service or designated agent(s) has authorized lethal removal of problem wolves from that same allotment.	Within the 10(j) boundary, shoot on sight of problem wolves for a grazing permittee would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
Service and designated agent take of chronic depredating wolves	No lethal or injurious nonlethal take would be permitted.	The Service and designated agent(s) may carry out harassment, nonlethal control measures, relocation, placement in captivity, or lethal control of problem wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, dogs, or other domestic animals, or remains of livestock, dogs, or domestic animals that show that the injury or death was caused by wolves, or evidence that they were in the act of attacking livestock, dogs, or other domestic animals; (2) the likelihood of additional wolf-caused losses or attacks may occur if no control action is taken; (3) evidence of unusual attractants or artificial or intentional feeding of wolves; and (4) evidence that animal husbandry practices recommended in approved allotment plans and annual operating plans were followed.	Within the experimental population boundary, shoot on sight of problem wolves for a private landowner would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Agency take to reduce impacts on wild ungulates	No lethal or injurious nonlethal take would be permitted.	If wolf predation is having an unacceptable impact on wild ungulate populations (deer, elk, moose, bighorn sheep, mountain goats, antelope, or bison) as determined by the respective State or Tribe, a State or Tribe may lethally remove the wolves in question. "Unacceptable impact" is defined as an "Impact to ungulate population or herd where a State or Tribe has determined that wolves are one of the major causes of the population or the herd not meeting established State or Tribe management goals." States or Tribes must submit a science-based report showing action meets regulatory standard. The Service must determine that an unacceptable impact to wild ungulate populations or herds has occurred and that the proposed lethal removal is science based, and not in conflict with State Plan.	Within the experimental population boundary, agency take to reduce impact to wild ungulates would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
Incidental take by private landowner or grazing permittee	No incidental take would be permitted.	Take of a gray wolf is allowed if the take is accidental and incidental to an otherwise lawful activity and if reasonable due care was practiced to avoid such take, and such take is reported to the Service or its designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited).	Same as alternative 1.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Additional taking provisions for agency employees	No injurious take would be permitted.	Any employee or agent of the Service or appropriate federal, state, or Tribal agency who is designated in writing for such purposes by the Service, when acting in the course of official duties, may take a wolf from the wild if such action is for: (1) scientific purposes; (2) to avoid conflict with human activities; (3) to relocate a wolf within the nonessential population areas to improve its survival and recovery prospects; (4) to return wolves that have wandered outside the nonessential population areas; (5) to aid or euthanize sick, injured, or orphaned wolves; (6) to salvage a dead specimen that may be used for scientific study; (7) to aid in law enforcement investigations involving wolves; and (8) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service.	Same as alternative 1 for areas within the experimental population boundary. For areas covered under the 10(a)(1)(A) permit, the following forms of take may occur: (1) for scientific purposes; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to salvage a dead specimen that may be used for scientific study; (4) to aid in law enforcement investigations involving wolves; and (5) to prevent wolves with abnormal physical or behavioral characteristics, as determined by the Service.

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2 **Table ES-2. Comparison of the Potential Environmental Impacts of the Alternatives**

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Biological Resources – Species of Special Concern – Wolves	Under the no-action alternative, wolves would remain listed as endangered, and take would be limited. The wolf population is expected to increase in size and distribution in areas where habitat suitability is high (i.e., sufficient wild prey and limited contact with humans).	Alternative 1 could have adverse environmental impacts to individual wolves through regulated take but is not expected to hinder recovery or have population-level effects in the long term. Alternative 1 would provide management flexibility, which would contribute in the long term to achieving statewide management objectives for wolves and other wildlife species.	Alternative 2 would provide added protection for wolves in the 10(a)(1)(A) permit area, which may lead to an increase in growth and distribution of the reintroduced wolf population in the short term. In the long term, the potential environmental impacts would be the same as under alternative 1 because of natural dispersal outside the 10(a)(1)(A) permit area.

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Biological Resources – Other Species of Special Concern	The lack of flexibility for the management of reintroduced wolves could result in short- or long-term, adverse effects on prey species. The no-action alternative could also have long-term, adverse effects on the Mexican wolf if the ranges of both species expand and interbreeding occurs. However, adverse impacts to species of special concern are not likely because substantial population declines of species of special concern have not been documented as a result of previous wolf reintroductions elsewhere in North America.	Potential environmental impacts would be the same as those described under the no-action alternative because management flexibility for reintroduced wolves under alternative 1 would not include provisions for the take of wolves for the purposes of protecting or managing species of special concern. Therefore, alternative 1 could result in short- or long-term, adverse effects on some species of special concern.	Potential environmental impacts would be the same as under alternative 1.
Biological Resources – Other Wildlife	The lack of flexibility for the management of reintroduced wolves could result in short- or long-term, adverse impacts to prey populations because the State would not have the ability to manage wolves for the purposes of managing other wildlife populations for conservation.	Alternative 1 could have long-term, beneficial impacts on prey populations because if population levels decline below established State management goals as a result of wolf reintroduction, management flexibility, including nonlethal and/or lethal take, afforded to the State under alternative 1 would allow the State to take a limited number of wolves as a means to achieve its established goals for the statewide management of ungulate populations.	Potential environmental impacts under alternative 2 would be the same as under alternative 1 because the State would have the same amount of flexibility in its management of reintroduced wolves to achieve its management goals for ungulate populations.
Cultural Resources – Tribal Cultural Resources	The State and Tribes would have limited management flexibility under this alternative to control the presence of wolves that may cause damage to archaeological and historical resources and that may inhibit the potential for Tribal access to these resources. The reintroduction of wolves could also affect natural resources of importance to Tribes in part due to	Potential impacts to Tribal cultural resources would be similar to those described for the no-action alternative, although for some resources, potential impacts could be reduced due to the management flexibility available under the 10(j) rule and the potential for State and/or Tribal wolf management plan(s) to be developed in coordination with the Service.	Potential impacts to Tribal cultural resources would be similar to those described for alternative 1 due to the management flexibility. Slight differences may occur in Jackson County and western Larimer County.

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
	<p>competition resulting in changes to predation habits or habitat selection. The reintroduction of wolves could affect wildlife species that are hunted or used by the Tribes, such as elk, deer, and other ungulates. Elk and deer populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. These animals would be impacted over the long term because the State and Tribes would not have the flexibility to manage wolves to limit elk and deer population decline or facilitate recovery; the same could occur for pronghorn, wild sheep, bison, and moose.</p>		
Socioeconomic Resources	<p>Due to the lack of management options under the no-action alternative, outdoor recreation, agriculture, and livestock producers would experience the most socioeconomic impacts. Lethal or nonlethal methods to address wolves if they reduce the population of ungulates below State management goals would not be available as a management tool. Outfitters and guides could experience long-term localized consequences from the lack of flexibility for take. A decline in hunting applications could lead to decreased wildlife revenue for CPW. Between \$7,078 and \$82,013 in livestock depredation losses could occur annually under the no-action alternative, which represents between 0.0002 percent to 0.0020</p>	<p>Alternative 1 would result in long-term benefits for Colorado outdoor recreation outfitters and businesses compared to the no-action alternative. Under alternative 1, the State and Tribes would manage the reintroduction of wolves with the greatest degree of flexibility. Alternative 1 would result in fewer direct long-term costs to livestock producers. Implementation of alternative 1 may not fully offset indirect economic losses caused by livestock stress from wolf predation. Additionally, livestock producers could incur costs for implementing nonlethal take strategies.</p>	<p>The socioeconomic impacts under alternative 2 within the experimental population boundary would be the same as those described for alternative 1. The impacts for outfitters and guides would be similar to those described in the no-action alternative within the 10(a)(1)(A) permit area. Due to the limited options for implementing management, big game hunting demand may shift to wolf-free areas. Alternative 2 would allow for lethal and/or nonlethal take in most areas of the State, except for parts of Jackson County and western Larimer County, which would be subject to section 10(a)1(A). Under alternative 2, livestock producers within the section 10(a)(1)(A) permit boundary may face disproportionately higher direct and indirect costs from wolf depredation.</p>

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
	percent of the total value of cattle and sheep.		
Environmental Justice	<p>Under the no-action alternative, if wolves are present within the Brunot Area lands or on Tribal reservations, localized impacts could be disproportionately high and adverse for Tribal members, particularly those who rely economically on livestock production or hunting and those who rely on subsistence hunting. This alternative could result in localized disproportionately high and adverse impacts to low-income and minority livestock producers and outfitters and guides, particularly in the focal counties due to the presence of suitable ecological conditions for gray wolves. Under this alternative, these impacts would not be mitigated because reintroduced gray wolves would be managed as an endangered species under the ESA.</p>	<p>Potential effects to Tribes would be mitigated by involving affected Tribes in planning processes to manage reintroduced wolves in accordance with the section 10(j) rule. Therefore, disproportionately high and adverse effects to Tribes are not expected under alternative 1.</p> <p>Disproportionately high and adverse impacts could occur on low-income outfitters and guides in local areas based on the factors discussed under the no-action alternative. Direct costs to livestock producers over the long term resulting from depredation would be lower under this alternative, compared to the no-action alternative.</p> <p>Implementation of alternative 1 may not fully mitigate against indirect economic losses or incurred costs to implement nonlethal take strategies. The potential for disproportionately high and adverse impacts would be reduced under alternative 1 compared to the no-action alternative.</p>	<p>Under alternative 2, potential impacts to population groups of concern would be the same as described under alternative 1 for areas within the proposed experimental population boundary, which would cover most of the state. Disproportionately high and adverse impacts to Tribes are not expected because the Service would work with affected Tribes to develop wolf management plans that would mitigate potential effects.</p> <p>While lethal take of wolves would be prohibited within the section 10(a)(1)(A) permit boundary, alternative 2 would still provide the State of Colorado flexibility to manage an existing population of gray wolves to meet State population goals for big game ungulate species. Impacts to outfitters and guides would be similar to impacts described under alternative 1. Within the section 10(a)(1)(A) permit boundary, impacts to low-income and minority livestock producers would be slightly reduced compared to the no-action alternative; however, these impacts may still be disproportionately high and adverse due to the cost of implementing nonlethal take measures.</p>

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ACRONYMS AND ABBREVIATIONS

1		
2	CEQ	Council on Environmental Quality
3	CFR	Code of Federal Regulations
4	CPW	Colorado Parks and Wildlife
5	EIS	environmental impact statement
6	ESA	Endangered Species Act
7	FR	<i>Federal Register</i>
8	MWEPA	Mexican Wolf Experimental Population Area
9	NEPA	National Environmental Policy Act
10	NPS	National Park Service
11	OAHP	(Colorado) Office of Archaeological and Historic Preservation
12	OHV	off-highway vehicle
13	SAG	(Colorado Wolf Management Plan) Stakeholder Advisory Group
14	Service	U.S. Fish and Wildlife Service
15	SGCN	Species of Greatest Conservation Need
16	State Plan	Colorado Wolf Restoration and Management Plan
17	SWAP	(Colorado's) State Wildlife Action Plan
18	TWG	(Colorado Wolf Management Plan) Technical Working Group
19	USC	United States Code
20	USDA	United States Department of Agriculture
21	USEPA	U.S. Environmental Protection Agency

CHAPTER 1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The U.S. Fish and Wildlife Service (Service) is evaluating a range of alternatives to address a request from the State of Colorado to designate wolves reintroduced into Colorado as an experimental population under section 10(j) of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [USC] 1531 et seq.). The section 10(j) designation would provide management flexibility to the state for the reintroduction and management of the gray wolf (*Canis lupus*). The gray wolf is currently listed as endangered in 44 states, including portions of Arizona, New Mexico, Oregon, Utah, and Washington, and threatened in Minnesota under the ESA. Wolf populations in Montana, Wyoming, Idaho, and the eastern portions of Washington and Oregon and a small portion of north-central Utah are not listed under the ESA. On November 3, 2020, Colorado voters approved Proposition 114 (codified as Colorado State statute 33-2-105.8), a citizen-initiated ballot measure requiring the Colorado Parks and Wildlife (CPW) Commission to create a plan to reintroduce the gray wolf to a portion of the species' historical range in Colorado by the end of 2023. As part of the reintroduction process, CPW has requested the Service designate the reintroduced gray wolf population as experimental under section 10(j) of the ESA. Designating the population as experimental would allow the Service to tailor ESA protections for the population to provide management flexibility and better address stakeholder concerns.

The Service has regulatory authority under the ESA to manage the conservation and recovery of federally listed threatened and endangered species, including creating rules and regulations and permitting legitimate activities that would otherwise be prohibited by federal law. Development of a 10(j) rule is considered a major federal action requiring review under the National Environmental Policy Act of 1969 (NEPA). This environmental impact statement (EIS) has been prepared in accordance with NEPA and its implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508). Appendix A includes descriptions of other federal, state, and international laws, policies, and treaties that are relevant to the proposed action and analysis in the EIS. The EIS assesses the environmental impacts that may result from implementing either of the action alternatives, which would designate wolves reintroduced to Colorado as an experimental population under section 10(j) of the ESA, or from the State-led reintroduction of the species without a section 10(j) rule (the no-action alternative).

1.2 PURPOSE OF THE ACTION

The purpose of this action is to provide management flexibility for the State of Colorado in its efforts to reestablish a population of gray wolves in a portion of the species' historical range in Colorado and to further the conservation of the species. This reintroduction effort is a result of Colorado State statute 33-2-105.8, passed on November 3, 2020, which directs the CPW Commission to develop a plan to introduce gray wolves to Colorado.

1.3 NEED FOR THE ACTION

Currently, the gray wolf is listed as endangered under the ESA in Colorado. To facilitate reintroduction efforts, the State of Colorado has requested the Service designate the reintroduced population as an experimental population under section 10(j) of the ESA. This designation would reduce the regulatory impact of reintroducing a federally listed species in a specific geographic area (an experimental population boundary). This EIS evaluates the use of the 10(j) process for this reintroduction.

1.4 BACKGROUND

Gray wolves were common in Colorado prior to the early 1900s. After bison (*Bison bison*), elk (*Cervus elaphus*), deer (*Odocoileus* spp.), and other native ungulate species were decimated by unregulated hunting and settlement, wolves and other large predators threatened the expanding livestock industry when the populations of their existing prey declined. By the 1940s, government-sponsored predator control programs and overhunting eradicated wolves across most of the species' historical range in the contiguous United States. The last known wolf in Colorado was killed in Conejos County in 1945.

Subspecies or regional populations of subspecies of the gray wolf were first listed under the Endangered Species Preservation Act of 1966 and the Endangered Species Act of 1969, predecessors of today's ESA. However, because modern taxonomists recognized fewer subspecies, the entire species was listed in 1978 as an endangered species throughout the contiguous United States, except in Minnesota where wolves were listed as threatened (85 *Federal Register* [FR] 69778). As enacted by Congress, the purposes of the ESA are "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take steps as may be appropriate to achieve the purposes of the treaties and conventions set forth..." The ESA "further declared to be the policy of Congress that all Federal Departments and agencies shall seek to conserve endangered species and threatened species and shall use their authorities in furtherance of this Act." The ESA also states "the Secretary shall develop and implement plans (herein, referred to as 'recovery plans') for the conservation and survival of endangered species..."

The Service implemented three gray wolf recovery programs in specific regions of the country within the species' historical range—the northern Rocky Mountains, the southwestern United States, and the eastern United States—to establish and prioritize recovery of regional populations of gray wolves. In the northern Rocky Mountains, gray wolves were designated as an experimental population and reintroduced into two of three recovery areas. Gray wolves began to naturally recolonize the third recovery area in northwestern Montana. This population initially was managed as an endangered species under the ESA. Mexican wolves were also designated as an experimental population and reintroduced into the southwestern United States. Recovery of gray wolves in the eastern US relied on natural recolonization from an extant population in Minnesota (85 FR 69778 2020). The wolf population in the northern Rocky Mountain region, found in Montana, Wyoming, Idaho, the eastern portions of Washington and Oregon, and a small portion of north-central Utah, has since been delisted from the ESA, in 2009 and 2012 (74 FR 15123 2009; 77 FR 55530 2012).

In 2019, the Service evaluated the classification of gray wolves in the contiguous United States (lower 48 states) and Mexico under the ESA and proposed to delist the gray wolf due to the biological recovery of the species. Following that evaluation, in 2020 the Service published a final rule in the *Federal Register* to remove the species in the contiguous United States and Mexico from the Lists of Endangered and Threatened Wildlife and Plants (85 FR 69778 2020). The final rule to delist the species was based upon review of the best scientific and commercial data currently available, which indicated that current and foreseeable threat factors for the species, including human-caused mortality, habitat and prey availability, disease and parasites, and the effects of climate change, were not likely to result in reductions in gray wolf numbers or habitat (85 FR 69778 2020).

The Service finalized the rule to delist the gray wolf (85 FR 69778) in 2020, removing all gray wolves in the lower 48 states from the lists of species protected under the ESA. However, the final delisting rule was vacated by court order (*Defenders of Wildlife v. U.S. Fish & Wildlife Serv.*, No. 21-CV-00344-JSW,

1 2022 WL 499838 [N.D. Cal. Feb. 10, 2022]) on February 10, 2022. With this court order, gray wolves
2 outside the delisted northern Rocky Mountains population in Wyoming, Montana, Idaho, the eastern
3 portions of Washington and Oregon, and north-central Utah were once again protected under the ESA.
4 Gray wolves are listed as threatened in Minnesota and endangered in 44 additional states. Any take
5 (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such
6 conduct) of wolves in these areas without a permit or other authorization is prohibited by federal law
7 (USFWS 2022a).

8 After wolf reintroduction in the northern Rocky Mountains, unconfirmed wolf sightings became more
9 common in Colorado. However, the first confirmed wolf in Colorado in modern times was struck and
10 killed by a vehicle near Idaho Springs in 2004. Although four additional lone wolves have been
11 confirmed in Colorado since 2004, no resident groups were documented in the state until 2019. In January
12 2020, CPW field personnel followed up on sighting reports from the public and confirmed at least six
13 wolves traveling together in extreme northwest Colorado. This group was down to a single individual
14 later that year and, at present, there is no indication that any wolf or wolves remain in the northwest
15 corner of the state. Separately, in north-central Colorado, an individual wolf from Wyoming was first
16 documented during summer 2019 and paired up with another wolf during winter 2020. This pair produced
17 offspring in spring 2021, becoming the first documented reproductively active group in Colorado in
18 recent history. At present, this group contains the only known wolves in the state and is composed of
19 seven to eight individuals.

20 The Service defines a wolf population as “at least two breeding pairs of wild wolves successfully raising
21 at least two young each year (until December 31 of the year of their birth), for two consecutive years”
22 (USFWS 1994). According to this definition, because only one breeding pair has been identified in
23 Colorado, there are no existing gray wolf populations documented in the state.

24 As noted above, on November 3, 2020, Colorado voters approved Proposition 114, a citizen-initiated
25 ballot measure requiring the CPW Commission to create a plan to reintroduce the gray wolf in a portion
26 of the species’ historical range in Colorado. The statute requires the CPW Commission to reintroduce and
27 manage gray wolves no later than December 31, 2023. On [date], the CPW Commission released the draft
28 Colorado Wolf Restoration and Management Plan (the State Plan) for public review (REFERENCE).
29 Details of the draft plan are incorporated into the action alternatives discussed in Chapter 2 of this EIS
30 and assessed in Chapter 4, Environmental Consequences.

31 While the federal government typically leads reintroduction programs for species listed under the ESA,
32 Colorado’s gray wolf reintroduction plan is unique in that the effort is citizen-directed and State-led.
33 Reintroduction of gray wolves to Colorado is not an identified strategy in the Service’s recovery
34 programs for the species. However, because gray wolves remain listed as endangered throughout the state
35 of Colorado, any reintroduction and management program will require some involvement by the Service,
36 and CPW has requested that the Service develop a 10(j) rule under the ESA to provide increased
37 management flexibility for the reintroduced wolves. Under section 10(j) of the ESA, the Service may
38 designate a population of a listed species as an experimental population. This designation would reduce
39 the regulatory impact of reintroducing a federally listed species in a specific geographic area
40 (experimental population boundary), while still contributing to the species’ conservation. Section 10(j) of
41 the ESA is described further under section 1.6.1, below.

42 **1.5 PROJECT LOCATION AND DESCRIPTION**

43 CPW is planning to reintroduce gray wolves to a portion of the species’ historical range in the state of
44 Colorado. Potential reintroduction sites are discussed in the State Plan. However, the study area for this

1 analysis is larger than just the potential reintroduction sites and includes areas of potential habitat once
2 wolves are released. The study area under each alternative is discussed further in Chapter 2.

3 **1.6 PLANNING AND EIS PROCESS**

4 The following sections describe the planning and EIS process, including public involvement in the
5 process. Development of the alternatives evaluated in the EIS and detailed descriptions of the action
6 alternatives and the no-action alternative are provided in Chapter 2. A discussion of the scoping of issues
7 to be addressed in detail in the analysis is included in Chapter 3.

8 **1.6.1 Scope of the EIS**

9 This EIS evaluates the potential environmental effects of the Service’s proposed action to address the
10 State of Colorado’s request to issue a section 10(j) rule, consistent with section 10 of the ESA, to provide
11 management flexibility for the State of Colorado in reintroducing and managing gray wolves in a portion
12 of the species’ historical range, while still providing for conservation of the species. The reintroduction
13 effort is directed by State statute 33-2-105.8, which requires the State to reintroduce wolves no later than
14 December 31, 2023. The State may reintroduce wolves with or without further action by the Service, in
15 compliance with the State’s cooperative agreement under section 6 of the ESA; therefore, considering an
16 alternative to not pursue active wolf reintroduction efforts is outside the Service’s legal authority and
17 outside the scope of the EIS.

18 Furthermore, the State of Colorado is leading the development of the reintroduction and management plan
19 for gray wolves. As such, alternatives that propose management measures for reintroduced gray wolves
20 are outside the scope of the EIS. The proposed section 10(j) rule would address the potential for incidental
21 take resulting from State-led activities associated with reintroduction and management of gray wolves in
22 Colorado. These activities are described in the draft State Plan (REFERENCE). Reintroduction and
23 management of gray wolves in Colorado is not an identified priority of the Service’s national wolf
24 strategy outlined above; therefore, the Service is not proposing any additional management measures for
25 reintroduced wolves in Colorado.

26 **1.6.2 Scoping Process and Public Participation**

27 Following publication of the Notice of Intent to prepare an EIS, the Service held a public scoping period
28 from July 21, 2022, to August 22, 2022, to invite interested members of the public to ask questions and
29 provide input on the proposed action and alternatives and issues to be considered in the EIS. Three in-
30 person public meetings were held in Gunnison, Silverthorne, and Craig, Colorado, on August 2, August 3,
31 and August 4, 2022, respectively. A virtual public meeting was held on August 10, 2022. The numbers of
32 participants and summaries of comments received at each of these meetings are included in the Public
33 Scoping Summary Report (Appendix B). In general, comments received during public scoping included
34 suggestions for the range of alternatives (e.g., lethal vs. nonlethal management, boundary of the 10(j),
35 listing status of the gray wolf); ecosystem dynamics and the role the gray wolf plays; socioeconomics and
36 environmental justice, including impacts to livestock producers, outfitters, and tourism; components of
37 the NEPA analysis, including purpose and need and the scope of analysis; impacts to other sensitive
38 species such as the Mexican wolf; impacts to other wildlife, including ungulates; and impacts to Tribal
39 resources and Tribal consultation.

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the proposed action and the alternatives developed to address the purpose and need for the proposed action, defined in sections 1.2 and 1.3.

2.2 PROPOSED ACTION

Following approval of Proposition 114 by Colorado voters in November 2020, the State of Colorado requested that the Service develop a section 10(j) rule to provide management flexibility for the State-led wolf reintroduction and management efforts. In response to this request, the Service is proposing to issue a section 10(j) rule, consistent with section 10 of the ESA, to provide management flexibility for the State in reintroducing and managing gray wolves in Colorado. The Service would establish this framework in the fall of 2023 to meet the deadline established in Proposition 114, which requires that gray wolves are reintroduced before December 31, 2023. The section 10(j) rule would remain in place while the gray wolf is listed under the ESA, until the species is determined to be recovered and is delisted.

2.3 ALTERNATIVE SCOPING

The scope of the alternatives included in the EIS takes into consideration recommendations in the State Plan and comments received during internal and public scoping for the NEPA process.

2.3.1 Development and Evaluation of Alternatives

Internal scoping considered the types of regulatory frameworks, consistent with section 10 of the ESA, that the Service may implement based on federal authority under the ESA, federal priorities for management of gray wolf recovery, and the best available scientific information. Alternative frameworks were identified through internal scoping and are described in the sections below. The federal regulatory framework developed by the Service would address gray wolf reintroduction and management measures included in the State Plan. CPW began development of the State Plan following approval of Proposition 114 in November 2020. The State facilitated a public engagement process to invite feedback on the plan and convened a Technical Working Group (TWG) and Stakeholder Advisory Group (SAG), which both began meeting monthly in June 2021. CPW considered and incorporated this feedback, including management recommendations from the two groups and concerns raised in public comments, into the draft State Plan, released [date].

Participants in the public scoping process for this EIS identified various alternative regulatory frameworks and management measures that should be considered. Public comments related to proposed alternatives are summarized in the Public Scoping Summary Report (Appendix B). The Service considered all proposed alternatives identified during public scoping, but all of these alternatives are not evaluated in detail in the EIS. Alternatives addressed in the EIS and other identified alternatives that are not evaluated further are described briefly below.

2.3.2 Alternatives Addressed in the EIS

Three alternative approaches for the proposed regulatory framework were chosen for analysis in the EIS:

1. No-action alternative – Take no federal action to provide management flexibility to CPW; allow State reintroduction of the gray wolf as a federally listed endangered species.

- 1 2 Alternative 1 – Provide CPW management flexibility and provide for conservation of the species
2 by approving a section 10(j) rule for any gray wolf living in, or reintroduced to, the State of
3 Colorado.
- 4 3. Alternative 2 – Provide CPW management flexibility and provide for conservation of the species
5 by approving a section 10(j) rule for the gray wolf in a limited territory and issuing a permit under
6 section 10(a)(1)(A) for the gray wolf population outside the designated experimental population
7 boundary in the state of Colorado.

8 The three alternatives addressed in the EIS were developed during internal scoping. The two action
9 alternatives are consistent with section 10 of the ESA. The Service developed alternative 2 as an
10 alternative for managing reintroduced wolves and any established, pre-existing wolf populations in the
11 State, should one occur, consistent with section 10 of the ESA. The term “population” is defined in
12 section 1.4. The no-action alternative, is included in compliance with Council on Environmental Quality
13 (CEQ) regulations implementing NEPA (40 CFR 1502.14[c]). The no-action alternative considers
14 implementation of the State’s plan subject to restrictions under section 9 of the ESA. Under the no-action
15 alternative, the Service would not issue a section 10(j) rule or section 10(a)(1)(A) permit and would
16 continue to manage gray wolves in Colorado as an endangered species under the ESA. Detailed
17 descriptions of the alternatives evaluated in the EIS are discussed below.

18 **2.3.3 Alternatives Identified During Scoping, but Not Evaluated Further**

19 Twelve additional alternatives or alternative elements were identified during internal and public scoping
20 that are not evaluated further because they are outside the Service’s legal authority or would not meet the
21 purpose and need for the proposed action. These alternatives are summarized below, along with the
22 reasons they are not included for consideration in the EIS.

- 23 1. **Apply a section 10(j) rule to a smaller geographic area (experimental population**
24 **boundary)** – The Service considered evaluating an alternative to establish a smaller experimental
25 population boundary in Colorado. However, this alternative is not evaluated further because it
26 may pose undue restrictions on the ability of CPW to provide adequate habitat for gray wolves as
27 their population within the state grows.
- 28 2. **Establish a Candidate Conservation Agreement or other cooperative agreement –**
29 Establishing a Candidate Conservation Agreement or other cooperative agreement with the State
30 was not evaluated further in the EIS because these agreements would require the gray wolf to be
31 delisted under the ESA, which is outside the scope of the proposed action.
- 32 3. **No wolf reintroduction** – The Service considered an alternative under which the gray wolf
33 would not be intentionally reintroduced in Colorado. The recovery of the gray wolf in the state
34 would rely on natural recolonization and population growth, and the Service would continue to
35 manage the species as endangered under the ESA. However, this alternative is outside the
36 Service’s legal authority. The CPW Commission is required to comply with Colorado Revised
37 Statute 33-2-105.8 and reintroduce wolves in Colorado by December 31, 2023. Therefore, each of
38 the alternatives evaluated in the EIS assumes that the planned reintroduction and management of
39 gray wolves will move forward, led by the State of Colorado.
- 40 4. **Variations on Statewide Permits Issued by the Service** – During public scoping, commenters
41 suggested variations on Statewide permits such as developing a section 10(a)(1)(A) permit for the
42 entire State, a section 10(a)(1)(B) permit for the entire State, or a section 10(j) rule with no lethal
43 take. Part of the purpose of this effort is to provide management flexibility for the reintroduction

1 process. Use of a section 10(a)(1)(A) permit would not provide for this flexibility because the
2 permit would not allow for lethal take and may limit or prohibit nonlethal purposeful take. The
3 Service has previously included purposeful take in a 10(a)(1)(A) permit, which the courts later
4 invalidated (*Humane Society of the United States v. Kempthorne*, 579 F. Supp. 2d 7 (D. D.C.
5 2008)).

6 The Service considered the use of all regulatory frameworks, including the 10(a)(1)(B) permit;
7 however, this permitting tool is not used for recovery actions, such as the gray wolf
8 reintroduction. The section 10(a)(1)(B) permit is issued at the conclusion of the Habitat
9 Conservation Plan process as a mechanism to permit incidental take of a species; therefore, this is
10 not an appropriate regulatory mechanism to consider for this effort.

11 In regard to considering a section 10(j) rule with no lethal take permitted, this management
12 approach would best be accomplished through a different regulatory framework, such as a Safe
13 Harbor Agreement. The section 10(j) rulemaking process is most effective when it provides a
14 range of management flexibility, including lethal take, and therefore the Service did not consider
15 a scenario with a section 10(j) rule and no lethal take. While the Safe Harbor Agreement may be
16 the more appropriate tool, it would not meet the purpose and need for action because it would
17 limit management flexibility throughout the State.

- 18 5. **Alternative Elements Related to Wolf Release, Management, Compensation, and**
19 **Education** – Commenters provided suggestions on where wolves should be reintroduced, the use
20 of radio collars to track wolves, how many wolves should be introduced, providing a
21 compensation program for livestock producers, providing various education programs on conflict
22 reduction, the ecological importance of wolves, and management tools for livestock producers to
23 address wolves. All of these elements are directly related to the reintroduction of the gray wolf,
24 rather than the development of a regulatory framework, and are not within the scope of this EIS.
25 However, these elements were addressed in the draft State Plan, issued [DATE].
- 26 6. **Population Goals or Thresholds** – Commenters suggested various ways to implement
27 population goals and/or thresholds, including allowing for 1,000 wolves on the landscape,
28 creating a limit on lethal control actions if wolf populations are not meeting certain goals,
29 implementing ecosystem recovery targets as an indicator of wolf recovery, and setting population
30 goals and timelines for the delisting of the gray wolf. The determination of how many wolves will
31 be released per year and the goals for total numbers of wolves are outside the scope of the
32 Service’s effort, which is focused on the section 10(j) rulemaking process. These issues are
33 addressed in the draft State Plan. Additionally, setting population goals related to the federal
34 delisting of the gray wolf is a planning effort that is also outside the scope of this section 10(j)
35 rulemaking and would involve a planning process that is larger than the reintroduction of the gray
36 wolf to Colorado.
- 37 7. **Mexican Wolf Interactions** – Commenters provided a variety of comments related to the
38 Mexican wolf, including keeping the two populations of wolves separate, allowing them to
39 intermingle, and reintroducing a subpopulation of the Mexican wolf to Colorado. Issues related to
40 gray wolf and Mexican wolf interactions are addressed in the EIS under section 4.4, Species of
41 Special Concern, and section 4.9, Cumulative Impacts and Other Considerations. The Service
42 recognizes the potential for interactions between the two species, and managing these interactions
43 will occur though the regulatory framework chosen as a result of this EIS and rulemaking
44 process. The specific suggestion of including a reintroduction of the Mexican wolf under the
45 section 10(j) rulemaking is outside the scope of analysis and is considered as an alternative in the

1 final report prepared by the TWG (Colorado Wolf Management Plan TWG); this process is
2 considering the regulatory framework for managing reintroduced gray wolves, rather than the
3 direct reintroduction of species.

- 4 8. **Use of Trapping and Leghold Traps** – Commenters requested that the section 10(j) rule allow
5 for the trapping of gray wolves and the use of leghold traps. The Service considered this element
6 in the planning process since it has been used in other section 10(j) regulations for species
7 reintroductions. However, State policy only allows for the use of leghold traps for scientific
8 investigations, and the State does not consider collaring of wolves for tracking purposes to fall
9 under the category of scientific investigation. Therefore, this element was not included in the
10 range of alternatives.
- 11 9. **Reproductive Control** – Commenters suggested that reintroduced wolves should be spayed and
12 neutered because the population is experimental. Because the gray wolf is listed under the ESA as
13 an endangered species, reproductive control would be contrary to the goals of the ESA and the
14 mission of the Service with regard to promoting the recovery of listed species; therefore, this
15 element was not considered in the range of alternatives.
- 16 10. **Lethal Take of all Gray Wolves Prior to the Population Being Deemed Essential** –
17 Commenters suggested that the rule include an “escape clause” that would allow the Service to
18 lethally take all wolves in the experimental population if the nonessential status were to become
19 at risk. However, the gray wolf is listed under the ESA as an endangered species; therefore, lethal
20 take for this purpose would not be consistent with the ESA, the mission of the Service, or
21 recovery goals for the species and was not considered as an alternative element.
- 22 11. **Public Land Management** – Commenters suggested various ways to manage public lands to
23 address conflicts with wolves, including removing all livestock from public lands and forbidding
24 lethal take on public lands. The removal of grazing/livestock leases on federal lands is not within
25 the jurisdiction of the Service, and instead, falls to other agencies such as the Bureau of Land
26 Management and U.S. Forest Service. Lethal take on public lands would occur within the same
27 regulatory framework and same restrictions as lethal take on state and private lands.
- 28 12. **Variations on the 10(j) Boundary** – Commenters suggested that the experimental population
29 boundary be expanded to include a buffer zone around Colorado’s state borders to prevent
30 unregulated take where wolves lack ESA protection. Special management provisions are only
31 applicable within the experimental population boundary where an ESA-listed species is present.
32 If the gray wolf is not federally listed as endangered in a state, designation of a section 10(j) rule
33 and creation of an experimental population boundary is not applicable, and these regulatory tools
34 would not change the designation of wolves in that state to offer more protection. Furthermore, a
35 section 10(j) rule and experimental population boundary cannot be applied in areas where
36 existing populations of a species are present. Colorado coordinated with adjoining states during
37 the State’s planning process for reintroduction, and these states did not express a desire to be
38 included in the section 10(j) designation. For these reasons, this element was not carried forward
39 for analysis.

40 **2.4 ALTERNATIVES CONSIDERED IN DETAIL IN THE ENVIRONMENTAL** 41 **ANALYSIS**

42 The no-action alternative and the two action alternatives are described below. A comparison of the
43 alternatives is provided after the description of the alternatives in table 2-4.

1 In the event the gray wolf is delisted from the ESA before the final section 10(j) rule is issued, the take
2 provisions noted below would no longer apply, and Colorado would apply to the Service for a Candidate
3 Conservation Agreement with Assurances and accompanying section 10(a)(1)(A) permit with no other
4 regulatory framework applied to the gray wolf in Colorado. The Candidate Conservation Agreement
5 would identify specific conservation measures that the State would voluntarily undertake to conserve gray
6 wolves in Colorado. Assurances would be authorized by the section 10(a)(1)(A) permit and would specify
7 that no additional land, water, or resource use restrictions, aside from any restrictions identified in the
8 agreement, would be applied should gray wolves be listed under the ESA in the future (USFWS and
9 NOAA 2016). The Service would follow this approach regardless of the alternative selected.

10 The State Plan would direct the population goals and management of gray wolves in Colorado. Initial
11 planning indicates that the State intends to release 10 to 15 wolves per year, for three years beginning in
12 2023. The State has identified a target threshold of 200 wolves in Colorado before the species would be
13 delisted from the State’s list of threatened and endangered species and managed as a delisted, nongame
14 species.

15 **2.4.1 No-Action Alternative**

16 **Background**

17 CEQ regulations (40 CFR 1502.14[c]) require an EIS to evaluate the no-action alternative. The no-action
18 alternative provides a benchmark that enables decisionmakers to compare the potential environmental
19 effects of the proposed action alternatives with conditions that are likely to occur in the absence of the
20 proposed action. Under the no-action alternative, the proposed action would not occur. This means that
21 the Service would not establish a section 10(j) rule or issue a 10(a)(1)(A) permit, consistent with section
22 10 of the ESA, to provide management flexibility for the State in reintroducing gray wolves to Colorado
23 and provide for conservation of the species. The no-action alternative would not meet the purpose and
24 need for the proposed action but is being analyzed in the EIS to provide a reference point against which
25 the potential effects of the action alternatives can be compared.

26 **Summary**

27 Under the no-action alternative, the Service would not issue a section 10(j) rule or other federal regulatory
28 framework consistent with section 10 of the ESA. An experimental population boundary would not be
29 created in Colorado, and the gray wolf would be considered endangered throughout the state.

30 **Detailed Description**

31 Under the no-action alternative, in compliance with State statute 33-2-105.8, the CPW Commission
32 would still reintroduce gray wolves to Colorado by the end of 2023, but they would be reintroduced as a
33 federally endangered species.

34 The Service would manage reintroduced gray wolves as an endangered species in the state. This means
35 that:

- 36 ▪ State-led management actions and any actions that have the potential to result in a take of the
37 species would be regulated under section 9 of the ESA, which establishes prohibitions related to
38 endangered species.
- 39 ▪ Federal agencies would be required to consult with the Service under section 7 of the ESA if
40 reintroduced gray wolves are present or likely to be present in the area of effect for a proposed
41 federal action.

- 1 ▪ The Service may issue section 10(a)(1)(A) permits to individuals or organizations for scientific
2 activities or activities that support recovery of the species. The types of permits that may be
3 issued are discussed in section 2.4.4. The Service would not issue a section 10(a)(1)(A) permit to
4 the State of Colorado under this alternative.

5 The specific actions allowed under the no-action alternative are shown in table 2-1.

6 **Table 2-1. Actions Permitted under the No-Action Alternative**

Situation	Alternative Element
Consultation (per section 7)	Federal agencies are required to consult with the Service when any project or action they authorize, fund, or carry out may affect federally listed endangered gray wolves in Colorado.
Listed status of wolves	Endangered.
Take in self-defense	Any person may take a gray wolf in defense of the individual's life or the life of another person.
Agency take of wolves determined to be a threat to human life and safety	The Service or designated agent(s) may promptly remove any wolf that the Service or designated agent(s) determines to be a threat to human life or safety.
Non-injurious take of problem wolves by private landowner or grazing permittee	Any person may conduct opportunistic harassment of any gray wolf in a non-injurious manner at any time. Opportunist harassment must be reported to the Service or designated agent(s) within seven days.
Injurious, nonlethal take of problem wolves by private landowner or grazing permittee (e.g., through use of less-than-lethal munitions)	No lethal or injurious nonlethal take would be permitted.
Taking of wolves "in the act" of depredation on private land	No lethal or injurious nonlethal take would be permitted.
Taking of wolves "in the act" of depredation on public land	No lethal or injurious nonlethal take would be permitted.
"Shoot on sight" of problem wolves for private landowner	No lethal or injurious nonlethal take would be permitted.
"Shoot on sight" of problem wolves for a grazing permittee	No lethal or injurious nonlethal take would be permitted.
Agency take of chronic depredating wolves	No lethal or injurious nonlethal take would be permitted.
Agency take to reduce impacts on wild ungulates	No lethal or injurious nonlethal take would be permitted.
Incidental take by private landowner or grazing permittee	No incidental take would be permitted.
Additional taking provisions for agency employees	No injurious take would be permitted.

7 **2.4.2 Alternative 1**

8 **Background**

9 Section 10(j) of the ESA includes provisions for establishing an experimental population of a federally
10 listed species. The designation "experimental population" had its origin in a 1982 amendment to the ESA,
11 which created section 10(j). Before the 1982 amendment, the Service could reintroduce endangered
12 species into unoccupied historic range, but reintroduction efforts were often met with public resistance.
13 One reason for this opposition was that the Service had no management tools to address the potential for

1 the listed species to disrupt future land management options. The “experimental population” designation
2 gives the Service more flexibility to manage endangered species by relaxing “take” prohibitions and
3 consultation requirements under the ESA.

4 An experimental population may be designated as “essential” or “nonessential.” An essential population
5 is considered essential to the continued existence of a federally listed threatened or endangered species
6 and is managed as if it were listed as threatened under the ESA (USFWS 2018).

7 A reintroduced population designated experimental and nonessential under section 10(j) is treated as a
8 species proposed for listing under the ESA for purposes of consultation under section 7. Other federal
9 agencies are required only to confer with the Service on federal activities affecting a nonessential
10 population that are likely to jeopardize the species. The exception would be for federal actions in national
11 parks and national wildlife refuges that may affect a nonessential population, which would still require
12 formal consultation with the Service under section 7 of the ESA. Management of a nonessential
13 experimental population can be tailored to specific areas and specific local conditions and concerns. The
14 experimental population rule has been used to reintroduce Mexican wolves to southern Arizona and New
15 Mexico, red wolves to Alligator River National Wildlife Refuge in North Carolina, and gray wolves to the
16 central Idaho and Greater Yellowstone Area recovery areas in the northern Rocky Mountain region.

17 **Summary**

18 Under alternative 1, the Service would designate gray wolves reintroduced into Colorado as an
19 experimental population under section 10(j) of the ESA. The Service would establish an experimental
20 population boundary to include the entire state of Colorado, which would outline the geographic area to
21 which the section 10(j) rule would apply. The section 10(j) rule would define the listing status of
22 reintroduced gray wolves and the allowable take of gray wolves in response to the management activities
23 proposed in the State Plan (see the detailed description of this alternative below for more information). As
24 part of the process of developing the section 10(j) rule, the Service would determine if reintroduced gray
25 wolves in Colorado are an essential or nonessential population (see section 1.4).

26 **Detailed Description**

27 Under alternative 1, the Service would designate the population released by the State of Colorado as an
28 experimental population. The “experimental population” designation gives CPW more management
29 flexibility because such populations can be treated as “a species proposed to be listed” or “threatened”
30 rather than “endangered.” The extent of the proposed experimental population boundary would be the
31 entire state of Colorado (see figure 2-1).

32 Under the section 10(j) rule, gray wolves would be managed under special regulations inside the proposed
33 experimental population boundary. If the proposed 10(j) rule is finalized, “Take” as defined under the
34 ESA, would be allowed to occur in some instances. “Take” under the ESA means to harass, harm, pursue,
35 hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. Provisions
36 related to Take that would be included in the section 10(j) rule are shown below in table 2-2.

37

1 **Table 2-2. Actions Permitted under Alternative 1**

Situation	Alternative Element
Listed status of wolves	Threatened
Consultation (per section 7)	Not required unless those actions are on lands of the national park system or the national wildlife refuge system (16 USC 1539).
Take in self-defense	Any person may take a gray wolf in defense of the individual's life or the life of another person.
Agency take of wolves determined to be a threat to human life and safety	The Service or designated agent(s) may promptly remove any wolf that the Service or designated agent(s) determines to be a threat to human life or safety.
Non-injurious take of problem wolves by private landowner or grazing permittee	Any person may conduct opportunistic harassment of any gray wolf in a non-injurious manner at any time. Opportunistic harassment must be reported to the Service or designated agent(s) within seven days.
Injurious, nonlethal take of problem wolves by private landowner or grazing permittee (e.g., through use of less-than-lethal munitions)	After the Service or designated agent(s) have confirmed wolf activity on private lands, on a public land-grazing allotment, or on a Tribal reservation, the Service or designated agent(s) may issue a written take authorization valid for not longer than one year, with appropriate conditions, to any landowner or public land permittee to intentionally harass wolves. The harassment must occur in the area and under the conditions as specifically identified in the take authorization.
Taking of wolves "in the act" of depredation on private land	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock, stock animals, or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals, or dogs were wounded, harassed, molested or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.
Taking of wolves "in the act" of depredation on public land	Any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may immediately take a gray wolf in the act of attacking his or her livestock on the person's allotment or other area authorized for his or her use without prior written authorization, provided that the producer or permittee provides evidence of livestock recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock were wounded, harassed, molested or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule. Any person legally present on public land, except land administered by the National Park Service (NPS), may immediately take a wolf that is in the act of attacking the individual's stock animal or dog, provided conditions noted in "taking of wolves in the act on private land" are met.
"Shoot on sight" of problem wolves for private landowner	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals or dogs were wounded, harassed, molested or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.

Situation	Alternative Element
"Shoot on sight" of problem wolves for a grazing permittee	At the Service's or designated agent(s) direction, the Service or designated agent(s) also may issue a shoot-on-sight written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take problem wolves on that permittee's active livestock grazing allotment if: (1) the grazing allotment has at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent(s) within the past 30-days, and (2) the Service or designated agent(s) has determined that problem wolves are routinely present on that allotment and present a significant risk to the health and safety of livestock, and (3) the Service or designated agent(s) has authorized lethal removal of problem wolves from that same allotment.
Agency take of chronic depredating wolves	The Service and designated agent(s) may carry out harassment, nonlethal control measures, relocation, placement in captivity, or lethal control of problem wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, dogs, or other domestic animals, or remains of livestock, dogs, or domestic animals that show that the injury or death was caused by wolves, or evidence that they were in the act of attacking livestock, dogs, or other domestic animals; (2) the likelihood of additional wolf-caused losses or attacks may occur if no control action is taken; (3) evidence of unusual attractants or artificial or intentional feeding of wolves; and (4) evidence that animal husbandry practices recommended in approved allotment plans and annual operating plans were followed.
Agency take to reduce impacts on wild ungulates	If wolf predation is having an unacceptable impact on wild ungulate populations (deer, elk, moose, bighorn sheep, mountain goats, antelope or bison) as determined by the respective State or Tribe, a State or Tribe may lethally remove the wolves in question. "Unacceptable impact" is defined as an "Impact to ungulate population or herd where a State or Tribe has determined that wolves are one of the major causes of the population or the herd not meeting established State or Tribe management goals." States or Tribes must submit a science-based report showing the action meets regulatory standards. The Service must determine that an unacceptable impact to wild ungulate populations or herds has occurred and that the proposed lethal removal is science based and not in conflict with the State Plan.
Incidental take by private landowner or grazing permittee	Take of a gray wolf is allowed if the take is accidental and incidental to an otherwise lawful activity and if reasonable due care was practiced to avoid such take, and such take is reported within 24 hours to the Service or its designated agent (the Service may allow additional time if access to the site of the take is limited).
Additional taking provisions for agency employees	Any employee or agent of the Service or appropriate federal, state, or Tribal agency who is designated in writing for such purposes by the Service, when acting in the course of official duties, may take a wolf from the wild if such action is for (1) scientific purposes; (2) to avoid conflict with human activities; (3) to relocate a wolf within the nonessential population areas to improve its survival and recovery prospects; (4) to return wolves that have wandered outside the nonessential population areas; (5) to aid or euthanize sick, injured, or orphaned wolves; (6) to salvage a dead specimen that may be used for scientific study; (7) to aid in law enforcement investigations involving wolves; and (8) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service.

1 Gray wolves that disperse from, or leave, the experimental population boundary would have the status
2 under the ESA that applies to wolves in the geographic area to which they travel. For example, wolves
3 that travel outside the experimental population boundary would be managed pursuant to the ESA where
4 federally listed or pursuant to state rules and regulations where they have been removed from ESA
5 protections.

6 **2.4.3 Alternative 2**

7 **Background**

8 The Service developed alternative 2 to address the possibility that an existing population of gray wolves is
9 identified in Colorado. If an existing population of gray wolves is determined to exist in Colorado, the
10 State could apply for a permit, and the Service could issue the State of Colorado a permit under section
11 10(a)(1)(A) of the ESA for management of the existing population. A section 10(j) rule would be
12 developed for the remainder of the state outside the existing population's range.

13 As noted in section 1.4, one reproductively active group of gray wolves has been documented in Colorado
14 as of the end of 2021. Section 10(j) of the ESA requires an experimental population to be established
15 outside the species' current range, determined based on whether a population of the species is currently
16 present in a geographic area. The Service defined a wolf population in the 1994 EIS for the
17 *Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho* (USFWS 1994), as
18 follows:

19 A wolf population is at least two breeding pairs of wild wolves successfully raising at least two
20 young each year (until December 31 of the year of their birth), for two consecutive years.

21 Section 10(a)(1)(A) of the ESA allows the Service to issue permits for the purposeful or direct take of a
22 federally listed species "for scientific purposes or to enhance the propagation or survival of the affected
23 species." The Service may issue several types of permits under section 10(a)(1)(A), depending on the
24 proposed activity and the status of the affected species under the ESA. These types of permits include:

- 25 ■ An Enhancement of Survival Permit, which is applied for species listed under the ESA and is
26 accompanied by a Safe Harbor Agreement detailing the baseline of the species and management
27 actions to be implemented to benefit the species,
- 28 ■ A Candidate Conservation Agreement with Assurances, which is applied for non-listed or
29 candidate species, or
- 30 ■ A Research and Recovery permit, which is applied for proposed activities including the capture,
31 handling, and transport of a listed species for scientific purposes.

32 **Summary**

33 Under alternative 2, if an existing population of gray wolves is determined to exist in Colorado, the
34 Service would issue a section 10(j) rule for reintroduced gray wolves in a limited territory and issue a
35 permit under section 10(a)(1)(A) of the ESA for management of the existing gray wolf population outside
36 the experimental population boundary. Section 10(a)(1)(A) authorizes the Service to develop conservation
37 agreements to further conserve the species. Similar to a section 10(j) rule, a section 10(a)(1)(A) permit
38 allows management flexibility for populations of federally listed threatened or endangered species while
39 providing for conservation of the species as a whole. A section 10(a)(1)(A) permit is applied to existing
40 populations, rather than reintroduced or experimental, populations. For the purposes of analysis, an
41 example boundary for a section 10(a)(1)(A) permit could follow the boundaries of the State of Colorado's
42 large game management units in areas where gray wolves are currently found. For the purposes of this

1 analysis, it is assumed that the following big game units would make up the geographic boundary of the
2 section 10(a)(1)(A) permit: 161, 6, 7, 16, 17, and 171. These units represent the area where wolves are
3 currently found in Colorado. Figure 2-2 shows the big game units that are used for analysis under
4 alternative 2.

5 The Service would issue a section 10(j) rule for the proposed experimental population of reintroduced
6 wolves and an experimental population boundary that would include a smaller geographic area in which
7 the final rule would apply. Within the experimental population boundary, federal regulations for
8 reintroduced gray wolves would be the same as those as described above under alternative 1. The
9 experimental population boundary would be established in in those areas of the state not encompassed by
10 the section 10(a)(1)(A) permit, see figure 2-2.

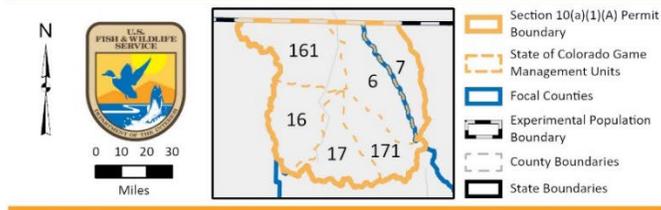
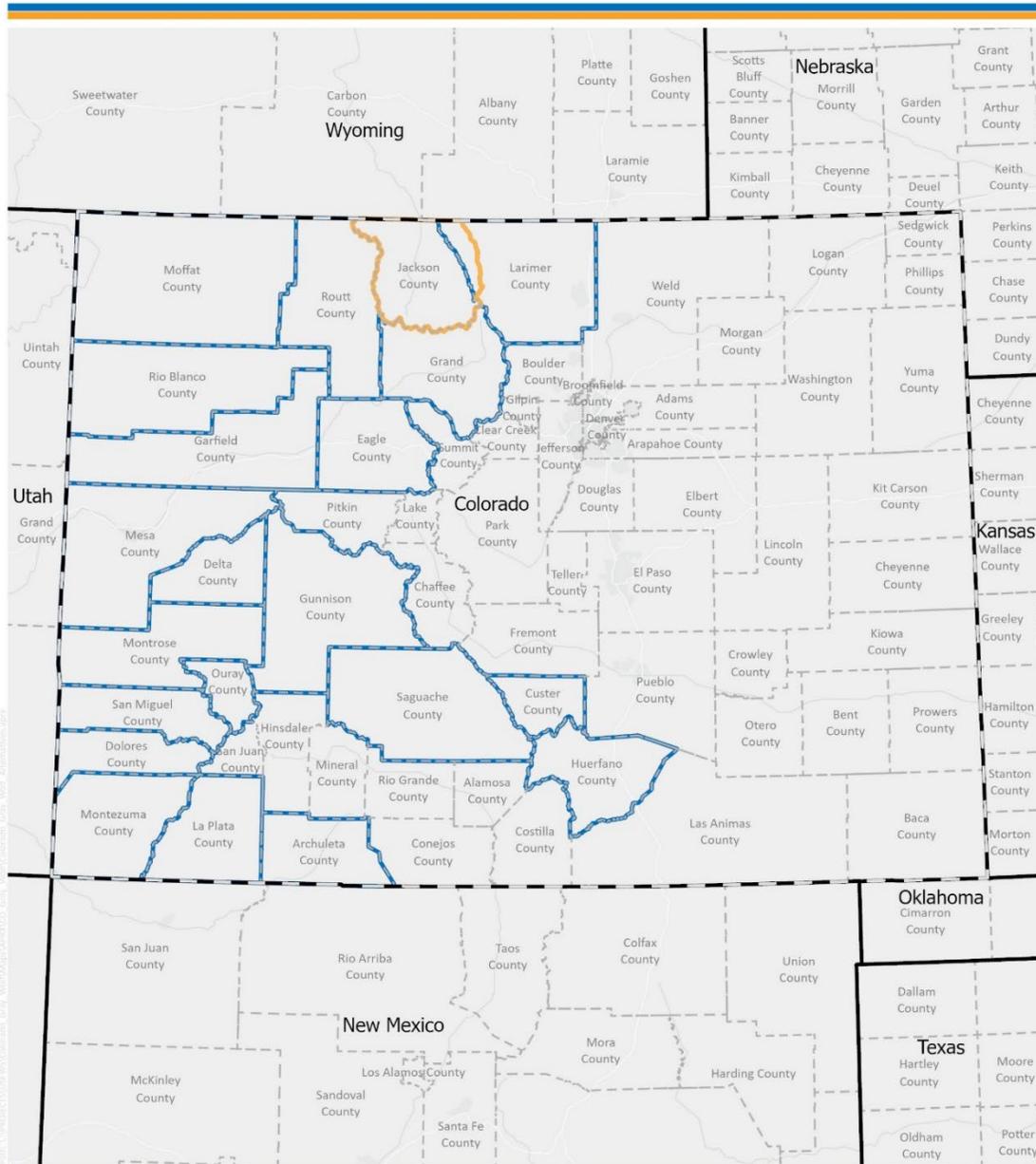


Figure 2-2
Experimental Population Boundary and
Section 10(a)(1)(A) Permit Boundary
under Alternative 2
 September 2022
Colorado Gray Wolf 10(j) Rulemaking EIS

1 **Detailed Description**

2 The same management tools that would be exempted from take in the section 10(j) rule under alternative
 3 1 would be included in the section 10(j) rule and section 10(a)(1)(A) permit under alternative 2. The
 4 allowed take in the 10(j) boundary can be seen in table 2-3. Allowed take from management measures
 5 under a 10(a)(1)(A) permit are shown in table 2-4.

6 **Table 2-3. Actions Permitted under Alternative 2**

Situation	Alternative Element
Listed status of wolves	Threatened within the experimental population boundary. Endangered in the area covered under the section 10(a)(1)(A) permit.
Consultation (per section 7)	Within the experimental population boundary, not required unless those actions are on lands of the national park system or the national wildlife refuge system (16 USC 1539). Required in areas covered by the section 10(a)(1)(A) permit.
Take in self-defense	Any person may take a gray wolf in defense of the individual's life or the life of another person.
Agency take of wolves determined to be a threat to human life & safety	The Service or designated agent(s) may promptly remove any wolf that the Service or designated agent(s) determines to be a threat to human life or safety.
Non-injurious take of problem wolves by private landowner or grazing permittee	Anyone may conduct opportunistic harassment of any gray wolf in a non-injurious manner at any time. Opportunist harassment must be reported to the Service or designated agent(s) within seven days.
Injurious, nonlethal take of problem wolves by private landowner or grazing permittee (e.g., through use of less-than-lethal munitions)	After the Service or designated agent(s) have confirmed wolf activity on private lands, on a public land-grazing allotment, or on a Tribal reservation, the Service or designated agent(s) may issue a written take authorization valid for not longer than one year, with appropriate conditions, to any landowner or public land permittee to intentionally harass wolves. The harassment must occur in the area and under the conditions specifically identified in the take authorization.
Taking of wolves "in the act" of depredation on private land	Within the experimental population boundary, take of wolves "in the act" of depredation on private land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
Taking of wolves "in the act" of depredation on public land	Within the experimental population boundary, take of wolves "in the act" of depredation on public land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
"Shoot on sight" of problem wolves for private landowner	Within the experimental population boundary, would be the same as alternative 1. Within the 10(a)(1)(A) area, no lethal take would be permitted. Only nonlethal take would be allowed.
"Shoot on sight" of problem wolves for a grazing permittee	Within the experimental population boundary, would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted. Only nonlethal take would be allowed.
Agency take of chronic depredating wolves	Within the experimental population boundary, would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted. Only nonlethal take would be allowed.

Situation	Alternative Element
Agency take to reduce impacts on wild ungulates	<p>Within the experimental population boundary, would be the same as alternative 1.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted. Only nonlethal take would be allowed.</p>
Incidental take by private landowner or grazing permittee	Take of a gray wolf is allowed if the take is accidental and incidental to an otherwise lawful activity and if reasonable due care was practiced to avoid such take, and such take is reported to the Service or its designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited).
Additional taking provisions for agency employees	<p>Same as alternative 1 for areas within the experimental population boundary.</p> <p>For areas covered under the 10(a)(1)(A) permit, the following forms of take may occur: (1) for scientific purposes; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to salvage a dead specimen that may be used for scientific study; (4) to aid in law enforcement investigations involving wolves; and (5) to prevent wolves with abnormal physical or behavioral characteristics, as determined by the Service.</p>

1

2 Likewise, under this alternative, dispersing wolves that leave the experimental population or section
 3 10(a)(1)(A) permit boundary would have the status under the ESA that applies to wolves in the
 4 geographic area to which they travel.

5

1 **Table 2-4. Comparison of Alternatives**

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Regulatory Framework Used	All ESA protections apply.	Section 10(j) throughout entire state of Colorado	If an existing population is documented before a 10(j) rule is finalized, the area (as defined by the Service) with the existing population would have a section 10(a)(1)(A) permit in a portion of Colorado (for analysis purposes, this alternative is based on the following State of Colorado Big Game Management units: 161, 6, 7, 16, 17, and 171). An experimental population boundary would be established for the remainder of the state outside this area.
Listed status of wolves	Endangered	Threatened	Threatened within the experimental population boundary. Endangered in area covered under section 10(a)(1)(A) permit.
Consultation (per section 7)	Federal agencies are required to consult with the Service when any project or action they authorize, fund, or carry out may affect federally listed endangered gray wolves in Colorado.	Not required unless those actions are on lands of the national park system or the national wildlife refuge system.	Within the experimental population boundary, not required unless those actions are on lands of the national park system or the national wildlife refuge system (16 USC 1539). Required in areas covered by the section 10(a)(1)(A) permit.
Take in self-defense	Any person may take a gray wolf in defense of the individual's life or the life of another person.	Same as the no-action alternative.	Same as the no-action alternative.
Agency take of wolves determined to be a threat to human life and safety	The Service or designated agent(s) may promptly remove any wolf that the Service or designated agent(s) determines to be a threat to human life or safety.	Same as the no-action alternative.	Same as the no-action alternative.
Non-injurious take of problem wolves by private landowner or grazing permittee	Any person may conduct opportunistic harassment of any gray wolf in a non-injurious manner at any time. Opportunistic harassment must be reported to the Service or designated agent(s) within seven days.	Same as the no-action alternative	Same as the no-action alternative.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Injurious, nonlethal take of problem wolves by private landowner or grazing permittee (e.g., through use of less-than-lethal munitions)	No lethal or injurious nonlethal take would be permitted.	After the Service or designated agent(s) has confirmed wolf activity on private lands, on a public land-grazing allotment, or on a Tribal reservation, the Service or designated agent(s) may issue written take authorization valid for not longer than one year, with appropriate conditions, to any landowner or public land permittee to intentionally harass wolves. The harassment must occur in the area and under the conditions as specifically identified in the take authorization.	Same as alternative 1.
Taking of wolves “in the act” of depredation on private land	No lethal or injurious nonlethal take would be permitted.	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock, stock animals, or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals, or dogs were wounded, harassed, molested, or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.	Within the experimental population boundary, take of wolves “in the act” of depredation on private land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
Taking of wolves “in the act” of depredation on public land	No lethal or injurious nonlethal take would be permitted.	Any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may immediately take a gray wolf in the act of attacking his or her livestock on the person’s allotment or other area authorized for his or her use without prior written authorization, provided that the producer or permittee provides evidence of livestock recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock	Within the experimental population boundary, take of wolves “in the act” of depredation on public land would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		were wounded, harassed, molested, or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule (50 CFR 17.84(n)(4)(iii) & (xiii)). Any person legally present on public land, except land administered by the NPS, may immediately take a wolf that is in the act of attacking the individual's stock animal or dog, provided conditions noted in "taking of wolves in the act on private land" are met.	
"Shoot on sight" of problem wolves for private landowner	No lethal or injurious nonlethal take would be permitted.	Any landowner may immediately take a gray wolf in the act of attacking livestock or dogs on his or her private land, provided the landowner provides evidence of livestock or dogs recently (less than 24 hours) wounded, harassed, molested, or killed by wolves, and the Service or designated agent(s) is able to confirm the livestock, stock animals or dogs were wounded, harassed, molested or killed by wolves. The carcass of any wolf taken and the area surrounding it should not be disturbed to preserve the physical evidence that the take was conducted according to this rule.	Within the experimental population boundary, shoot on sight of problem wolves for a private landowner would be the same as alternative 1. Within the 10(a)(1)(A) area, no lethal take would be permitted; only nonlethal take would be allowed.
"Shoot on sight" of problem wolves for a grazing permittee	No lethal or injurious nonlethal take would be permitted.	At the Service's or designated agent(s) direction, the Service or designated agent(s) also may issue a shoot-on-sight written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take problem wolves on that permittee's active livestock grazing allotment if: (1) the grazing allotment has at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent(s) within the past 30 days, and (2) the Service or	Within the experimental population boundary, shoot on sight of problem wolves for a grazing permittee would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		designated agent(s) has determined that problem wolves are routinely present on that allotment and present a significant risk to the health and safety of livestock, and (3) the Service or designated agent(s) has authorized lethal removal of problem wolves from that same allotment.	
Service and designated agent take of chronic depredate wolves	No lethal or injurious nonlethal take would be permitted.	The Service and designated agent(s) may carry out harassment, nonlethal control measures, relocation, placement in captivity, or lethal control of problem wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, dogs, or other domestic animals, or remains of livestock, dogs, or domestic animals that show that the injury or death was caused by wolves, or evidence that they were in the act of attacking livestock, dogs, or other domestic animals; (2) the likelihood of additional wolf-caused losses or attacks may occur if no control action is taken; (3) evidence of unusual attractants or artificial or intentional feeding of wolves; and (4) evidence that animal husbandry practices recommended in approved allotment plans and annual operating plans were followed.	Within the experimental population boundary, shoot on sight of problem wolves for a private landowner would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.
Agency take to reduce impacts on wild ungulates	No lethal or injurious nonlethal take would be permitted.	If wolf predation is having an unacceptable impact on wild ungulate populations (deer, elk, moose, bighorn sheep, mountain goats, antelope, or bison) as determined by the respective State or Tribe, a State or Tribe may lethally remove the wolves in question. "Unacceptable impact" is defined as an "Impact to ungulate population or herd where a State or Tribe has determined that wolves are one of the major causes of the population or the herd	Within the experimental population boundary, agency take to reduce impact to wild ungulates would be the same as alternative 1. Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		not meeting established State or Tribe management goals.". States or Tribes must submit a science-based report showing action meets regulatory standard. The Service must determine that an unacceptable impact to wild ungulate populations or herds has occurred and that the proposed lethal removal is science based, and not in conflict with State Plan.	
Incidental take by private landowner or grazing permittee	No incidental take would be permitted.	Take of a gray wolf is allowed if the take is accidental and incidental to an otherwise lawful activity and if reasonable due care was practiced to avoid such take, and such take is reported to the Service or its designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited).	Same as alternative 1.
Additional taking provisions for agency employees	No injurious take would be permitted.	Any employee or agent of the Service or appropriate federal, state, or Tribal agency who is designated in writing for such purposes by the Service, when acting in the course of official duties, may take a wolf from the wild if such action is for: (1) scientific purposes; (2) to avoid conflict with human activities; (3) to relocate a wolf within the nonessential population areas to improve its survival and recovery prospects; (4) to return wolves that have wandered outside the nonessential population areas; (5) to aid or euthanize sick, injured, or orphaned wolves; (6) to salvage a dead specimen that may be used for scientific study; (7) to aid in law enforcement investigations involving wolves; and (8) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service.	Same as alternative 1 for areas within the experimental population boundary. For areas covered under the 10(a)(1)(A) permit, the following forms of take may occur: (1) for scientific purposes; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to salvage a dead specimen that may be used for scientific study; (4) to aid in law enforcement investigations involving wolves; and (5) to prevent wolves with abnormal physical or behavioral characteristics, as determined by the Service.

CHAPTER 3 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

Chapter 3 describes the resources and existing conditions that may be affected by one or more of the alternatives described in Chapter 2. For this affected environment analysis, environmental conditions for each resource are evaluated using the best available data for that specific resource. Depending on the resource and the availability of data, discussion of the affected environment may vary. For example, the discussions of socioeconomic conditions and environmental justice communities use the most recent U.S. Census Bureau data available. For some topics, the 2020 decennial census provides the most recent information, while other topics must rely on the 2016 to 2020 5-year American Community Survey or the 2017 Census of Agriculture. Biological resource discussions use the most current and best available species data sets, surveys, and studies to inform the analysis.

The Service considered all potentially relevant resource areas for analysis in this EIS. In compliance with NEPA, its implementing regulations (40 CFR 1500–1508), and CEQ guidance for implementing NEPA, the discussion of the affected environment focuses only on those environmental resources that may be impacted by the proposed action. Section 3.1.1, below, provides more detail on which environmental resource areas were considered for analysis in the EIS.

3.1.1 Scoping Issues and Concerns

Introduction

An “issue” describes the relationship between actions and environmental resources (natural, cultural, and socioeconomic). Issues usually are adverse effects that any of the action alternatives or the no-action alternative might cause or that may currently exist. Issues may also be questions, concerns, or other relationships, including beneficial ones. Environmental resources and issues addressed in the EIS were identified during internal and public scoping.

Some environmental resources and issues were analyzed in detail in the EIS, while others were not. The decision to analyze an issue in detail was made solely based on the issue’s relevance to the decision being made or based on the best scientific judgment that the issue is related to the decision being made. For instance, some commenters were concerned about the use of lethal management measures. Many commenters were concerned about the reintroduction in general or about the population levels of gray wolf that could be sustained in Colorado. Issues related to the reintroduction in general are not part of the scope of the analysis of this EIS process; however, these impacts are considered under the cumulative impacts section of this EIS (section 4.9). In contrast, the decision regarding whether to issue a section 10(j) rule for gray wolves in Colorado would affect livestock producers and outfitters and guides. Consequently, potential socioeconomic impacts on livestock producers and outfitters and guides are evaluated in detail in the EIS, among the other issues listed in table 3-1, below. All issues raised during public scoping were considered but not all are analyzed in detail in the EIS. Explanations are included below for issues that are not analyzed in detail.

Environmental Resources and Issues Evaluated in the EIS

Environmental resources and issues analyzed in detail in the EIS are listed in table 3-1.

1 **Table 3-1. Environmental Resources and Issues Analyzed in Detail in the EIS**

Environmental Resources	Issues
Biological Resources – Species of Special Concern	Potential impacts on the gray wolf (e.g., from hazing and take), Mexican wolf, Gunnison sage-grouse, and Canada lynx.
Biological Resources – Other Wildlife	Potential impacts on elk, deer, and other ungulate species from the presence or absence of management flexibility.
Cultural Resources – Tribal Cultural Resources	Potential impacts identified through consultation with Tribes and the presence or absence of management flexibility to address impacts to sacred sites and hunting on Tribal lands.
Socioeconomic Resources	Potential impacts on ranch operations, outfitters, guides, and hunting from the presence or absence of management flexibility. Potential closures of public lands to protect den sites and interruptions in livestock operations.
Environmental Justice	Potential impacts on minority and low-income communities in the study area from the presence or absence of management flexibility.

2
3 **Environmental Resources and Issues Not Evaluated in Detail the EIS**

4 Environmental resources and issues that are not analyzed in detail in the EIS are listed in table 3-2. The reasons
5 why these resources and issues are not evaluated in detail are described.

6 **Table 3-2. Environmental Resources and Issues Not Evaluated in the EIS**

Environmental Resources	Issues
Air – Air Quality	Providing flexibility for reintroduction and management of gray wolves in Colorado would not result in actions that would affect air quality.
Biological Resources – Non-native or Exotic Species	Providing flexibility for reintroduction and management of gray wolves in Colorado would not result in the spread or management of non-native or exotic species.
Biological Resources – Vegetation	Providing flexibility for reintroduction and management of gray wolves in Colorado would not affect vegetative communities. As discussed under the affected environment and cumulative impact sections, the number of ungulates on the landscape could impact vegetation, but providing regulatory flexibility is not expected to cause changes in ungulate populations that would result in noticeable impacts to vegetation.
Biological Resources – Ecosystem Dynamics	While the introduction of wolves by the State could result in potential changes in vegetation communities, watersheds, water quality, and other ecosystem dynamics due to changes in wildlife populations, providing management flexibility through a regulatory framework is not expected to result in impacts to ecosystem dynamics. These impacts are further discussed in cumulative impacts.
Cultural Resources – Archaeological Resources	Providing management flexibility for reintroduction and management of gray wolves in Colorado would not result in adverse effects on archaeological resources. Wolves may create dens; however, the extent of this behavior is not expected to result in significant impacts on archaeological sites.
Cultural Resources – Cultural Landscapes	Providing management flexibility through a regulatory framework for the gray wolf in Colorado is not expected to change or impact cultural landscapes. Issues related to sacred sites are addressed under Tribal Resources.
Geological Resources – Geologic Features	Providing management flexibility for reintroduced gray wolves in Colorado would not result in widespread ground disturbance.

Environmental Resources	Issues
Geological Resources – Geologic Processes	As noted above, the proposed action would not result in widespread ground disturbance.
Lightscapes	The proposed action would not affect lightscapes or views of the night sky.
Human Health and Safety	While human encounters with wolves have the potential to result in human injury, this is rare. The ESA allows for take of individual wolves for personal protection. Wolves can also transmit disease, which can affect other wildlife species. Also, like many other mammals, wolves are susceptible to rabies, which can increase the likelihood of attacks on humans. Overall, wolves do not pose a serious risk to human health and safety through disease transmission or provoked/unprovoked attacks. The proposed action would not result in changes in the way risks to human health and safety are managed; therefore, this issue is not evaluated in detail in the EIS.
Soundscapes	Providing management flexibility through a regulatory framework may result in short-term noise disturbance during management actions, however, these would be localized and intermittent, and direct impacts would be minimal. Therefore, impacts to soundscapes are not analyzed in detail.
Viewsheds	Providing management flexibility through a regulatory framework may result in intermittent, localized visual impacts during management activities. These impacts would be minimal and are not evaluated in detail in the EIS.
Recreation – Recreational Resources	The proposed action would not affect overall access to or the quality of recreational resources in Colorado. The provision of management flexibility under a regulatory framework from the Service would not affect the ability of the public to engage in hunting, hiking, or birdwatching. Potential impacts to visitor use and experience due to temporary closures of public lands to protect den sites and changes in wildlife behavior are discussed in detail in the EIS.
Water Resources - Floodplains	No impacts to floodplains are expected as a result of actions permitted under a regulatory framework issued by the Service.
Water Resources – Marine or Estuarine Resources	No marine or estuarine water resources are located in the project area.
Water Resources – Water Quality or Quantity	The provision of management flexibility under a regulatory framework would not impact water resources including water quality or quantity, or wetlands.

1

2 **3.1.2 Study Area**

3 The study area for the affected environment analysis briefly discusses the entire state of Colorado but focuses on
4 Colorado counties with high ecological suitability for gray wolves, as determined by a 2022 study by Ditmer et al.
5 The detailed study area includes Colorado counties in proximity to suitable reintroduction sites identified by the
6 State and counties to which wolves are most likely to disperse based on suitable habitat and prey density. Areas
7 with high ecological suitability for gray wolves may have low or high risk for human-wolf conflicts. The detailed
8 study area includes 21 focal counties: Archuleta, Custer, Delta, Dolores, Eagle, Garfield, Grand, Gunnison,
9 Huerfano, Jackson, La Plata, Larimer, Mesa, Moffat, Montezuma, Montrose, Ouray, Rio Blanco, Routt,
10 Saguache, and San Miguel. These counties are shown on figures 2-1 and 2-2. While these counties encompass
11 areas where gray wolves are most likely to disperse, wolves can disperse long distances. The Service is proposing
12 to implement regulatory flexibility consistent with section 10(j) of the ESA statewide; therefore, the analysis of

1 the affected environment and potential impacts in this EIS considers both the statewide study area and the detailed
2 study area including the focal counties.

3 **3.2 SPECIES OF SPECIAL CONCERN**

4 Species of special concern include federally listed species; those that are federally listed or proposed to be listed
5 as endangered or threatened or that are candidate species for protection under the ESA; and those listed as
6 endangered or threatened at the State level in Colorado or identified as Species of Greatest Conservation Need
7 (SGCN) in Colorado’s State Wildlife Action Plan (SWAP; CPW 2015).

8 The proposed 10(j) rule to manage take of gray wolves following their reintroduction in Colorado would cover the
9 entire state. However, modeling has indicated that northwestern Colorado, within the Western Slope region,
10 provides the most suitable habitat for wolf reintroduction based on a suite of ecological and social factors (Ditmer
11 et al. 2022). As such, this is the area where the greatest need for regulatory flexibility regarding the management
12 of take is anticipated, and this discussion of existing conditions for species of special concern and the analysis that
13 follows focus on the 21 focal counties (figure 2-1). The following section discusses the federally listed gray wolf,
14 followed by other federally listed species. When considering other federally listed species, listed fish, insects,
15 flowering plants, and vegetation were not evaluated in detail because the management of gray wolf take would not
16 affect them.

17 **3.2.1 Gray Wolf**

18 **History**

19 The gray wolf historically inhabited most of North America, including Colorado, until it was nearly brought to
20 extinction in the 1930s as a result of predator control programs and bounties in the lower 48 United States and
21 southern Canadian provinces (USFWS 2022b). Gray wolves were listed as endangered under the U.S. Endangered
22 Species Preservation Act in 1966 and legally protected under the ESA in 1973. Since then, the Service has
23 managed gray wolves as an endangered species in Colorado under the authority of the ESA. See section 1.4 for a
24 detailed description of how the status of the gray wolf in Colorado has changed over the years.

25 Given their adaptability as habitat and prey generalists, wolves have been able to recolonize certain parts of their
26 historic range in North America and Europe (Mech 2017); as of 2020, about 6,000 gray wolves are estimated to
27 live in the lower 48 states (USFWS 2020a). Following the successful reintroduction of gray wolves to
28 Yellowstone National Park and Idaho in the 1990s (Fritts et al. 1997), and the subsequent expansion of stable and
29 healthy populations into adjacent states (Jimenez et al. 2017), gray wolves were delisted in Montana, Idaho,
30 Wyoming, eastern Oregon and Washington, and parts of Utah (USFWS 2022b). Wolves remain listed as
31 endangered in Colorado under the ESA and under the State’s Nongame, Endangered, or Threatened Species
32 Conservation Act (CO Rev Stat § 33-2-101).

33 **Current Population Status and Distribution**

34 The Service and the National Park Service (NPS) reintroduced gray wolves to central Idaho and Yellowstone
35 National Park in the 1990s, and by 2015, approximately 2,000 wolves were estimated to inhabit the northern
36 Rocky Mountains. In addition, wolf populations have been established in smaller numbers in Washington,
37 Oregon, and Northern California (Smith et al. 2010; USFWS 2020a; Carroll et al. 2021). Dispersing wolves from
38 the northern Rocky Mountains population have been documented in Colorado, and CPW receives approximately
39 100 sightings of wolves per year, although not all are valid. Since 2004, lone wolves have been confirmed
40 numerous times in Colorado, although no resident groups were documented in the state until January 2020, when
41 CPW confirmed a group of at least six wolves in Moffat County near the Wyoming and Utah border. That group
42 was visually observed, and genetic tests were conducted on scat samples near a scavenged elk carcass, which
43 confirmed at least four related individuals in the group (CPW 2020a). Separately, a collared adult female from the

1 Snake River Pack in Wyoming was documented in north-central Colorado in July 2019, and CPW collared an
2 adult male in January 2021 in Jackson County. In June 2021, a litter of six pups was observed with the Snake
3 River female and the CPW-collared male (now dubbed the “North Park group”). In February 2022, one of the
4 yearling female wolves from that litter was collared in North Park (CPW 2022a).

5 Wolves have been confirmed in Colorado, including one breeding pair, although at this time, a wolf population
6 has not been recognized in the state because it does not meet the Service’s definition of a wolf population, which
7 is “at least two breeding pairs of wild wolves successfully raising at least two young each year (until December 31
8 of the year of their birth), for two consecutive years ” (USFWS 1994).

9 **Ecology**

10 **Physical Characteristics.** Gray wolves are a highly adaptable species and were once the most widely distributed
11 mammal in the world (Ginsberg and Macdonald 1990). They are the largest member of the canid species; they
12 typically range in weight from 16 to 60 kilograms and are 1.3 to 1.5 meters long (Ginsberg and Macdonald 1990).
13 Pelt color varies, but in the northern Rocky Mountains, wolves are most commonly grizzled gray and black
14 (USFWS 1994).

15 **Group Sizes and Territories.** Gray wolves are a social species that live in groups led by a dominant breeding
16 pair (alphas). Groups consist of the breeding pair’s offspring from previous years and their new pups, as well as
17 other breeding-aged adults. Group size varies and may include more than 30 animals (Ginsberg and Macdonald
18 1990); however, average group sizes are typically smaller (e.g., 9.8 individuals in Yellowstone National Park;
19 NPS 2022a). Wolves may live in the wild up to 13 years (Mech 1988), but more commonly have a lifespan of 2 to
20 5 years; only 18 percent of wolves in Yellowstone National Park reached 6 years of age or older (NPS 2022a).

21 Wolf density is naturally controlled by prey density (Mech and Barber-Meyer 2015) and may also be intrinsically
22 self-regulated because of social strife and territoriality (Cariappa et al. 2011). A wolf group’s home range/territory
23 size varies by season and by year. From spring to fall, the home range is smaller because activity is centered
24 around the den and rendezvous sites. By September, pups are able to travel and hunt with the group, thus
25 increasing the size of the home range. Prey availability, intraspecific competition with nearby groups, and
26 landscape characteristics (both biotic and abiotic) all influence wolf territory size. Wolf group territory sizes in the
27 northern Rocky Mountains have ranged from 24 to 934 square miles (Colorado Wolf Management Plan TWG
28 2004).

29 **Reproduction.** Wolves reach reproductive maturity at approximately 2 years of age (Ginsberg and Macdonald
30 1990), and breeding typically occurs only between the dominant male and female in a group (although groups
31 with additional reproductively mature females have been documented with more than one litter per year; Mech
32 and Boitani 2003; USFWS et al. 2001). Wolves establish a den site during the winter breeding season, and pups
33 are born in April. Litter sizes can range from one to nine (Pletscher et al. 1997), but the average is five pups
34 (Ausband et al. 2017). Pup survival increases in groups with more adult females and is reduced in areas with wolf
35 harvest; this is as a result of harvest leading to reduced group size and breeder turnover, which decreases pack
36 stability and pup survival (Ausband et al. 2017).

37 **Dispersal.** Wolves can disperse across long distances (Ditmer et al. 2022; Morales-Gonzalez et al. 2022), which
38 has allowed them to recolonize former habitats where human-caused mortality sources are limited. Lone long-
39 distance dispersals have been documented in nearly all states within the historical gray wolf range (USFWS
40 2020b). Both male and female subadults will disperse hundreds of miles; radio collar data have demonstrated
41 wolves moving more than 600 miles straight line distance (Mech and Boitani 2003; Jimenez et al. 2017; Morales-
42 Gonzalez et al. 2022). Wolves that have been confirmed in Colorado are thought to have immigrated from
43 Wyoming (Ditmer et al. 2022).

44 **Genetics.** Taxonomic relationships of wolves in North America have been studied extensively, although
45 researchers disagree about the genotypic relationship between western gray wolves, eastern wolves, and red

1 wolves (USFWS 2020b; Carroll et al. 2021). Wolves in Colorado are part of the Western United States
2 metapopulation, which is also connected to the large population (>15,000) of wolves in western Canada (USFWS
3 2020b). The behavioral characteristic of young wolves to disperse when they reach sexual maturity enables
4 extensive genetic exchange through immigration and emigration with adjacent populations (Colorado Wolf
5 Management Plan TWG 2004).

6 **Food Habits.** Wolves function as keystone species, whereby the relationship with their prey species has a
7 cascading effect on lower trophic levels (Estes 1996; Ripple and Beschta 2003; Gable et al. 2020). Gray wolves
8 are opportunistic carnivores, and although they will prey on small mammals and birds, carrion, and even plant
9 matter, they tend to focus on large ungulates (Fuller 1989; Stahler et al. 2006; Colorado Wolf Management Plan
10 TWG 2004). However, wolves have demonstrated the ability to shift their diet to take advantage of seasonally
11 available food sources, e.g., beavers (*Castor canadensis*; Gable and Windels 2018; Gable et al. 2020).

12 Depending on the size of prey, adult wolves may consume from 10 to more than 20 ungulates (i.e., elk [*Cervus*
13 *canadensis*], mule deer [*Odocoileus hemionus*]) per year, including newborn/juvenile calves (Fuller 1989; NPS
14 2022a); as such, a high density of wild ungulates is necessary to maintain a viable population of wolves and
15 minimize depredation on livestock. Ungulate densities in Colorado exceed those in other states where wolves
16 maintain a viable population (Ditmer et al. 2022), and wolves are most likely to prey upon elk, mule deer, and
17 white-tailed deer (*O. virginianus*; Colorado Wolf Management Plan TWG 2004). Colorado has the largest
18 population of elk in any state (>300,000 individuals; Lukacs et al. 2018; CPW 2021a). The deer population was
19 estimated to be 416,426 in 2021 (CPW 2021b), which is a decrease from the early 2000s and less than the State's
20 population objectives (CPW 2020b). Mule deer populations in portions of western Colorado have been in decline
21 since the 1970s as a result of loss and alteration of habitat and migration routes, competition from elk, disease,
22 and predation (Bergman et al. 2015; CPW 2020b). The additional predation pressure from new wolf groups in
23 Colorado may lead to further declines in mule deer populations, depending on other limiting factors including
24 current predation pressure in Colorado's multi-predator system (e.g., mountain lions [*Puma concolor*], coyote
25 [*Canis latrans*]; Ballard et al. 2001; Forrester and Wittmer 2013).

26 Other ungulates that wolves may prey upon in Colorado include moose (*Alces alces*), bighorn sheep (*Ovis*
27 *canadensis*; *O. canadensis nelsoni*), and mountain goats (*Oreamnos americanus*), all of which were reintroduced
28 or introduced. These species are not expected to be a major food source for wolves in Colorado in the near term.
29 See section 3.3.2 for a more detailed description of other ungulate populations in the state.

30 **Domestic Prey Species/Livestock Depredation.** In addition to wild ungulates, wolves may kill and prey on
31 livestock (most commonly cattle and sheep) and domestic animals. The extent to which this occurs depends on
32 the density of wolves, the group size, and the density and spatial overlap of ungulate populations and livestock. In
33 addition, livestock husbandry practices, land cover type, human and road density, the severity of winters, and
34 local hunting pressure all contribute to the likelihood of depredations (DeCesare et al. 2018; Gese et al. 2021).
35 Livestock depredation may be a learned behavior by individual wolves who become repeat offenders (Bradley et al.
36 2015; DeCesare et al. 2018). DeCesare et al. (2018) found the strongest predictor of wolf depredation in
37 Montana was the occurrence of depredation in the previous year; however, the authors noted that may have been
38 as a result of animal husbandry practices and increased spatial overlap with livestock in certain districts as much
39 as an intrinsic learning behavior by individual wolves. Overall, depredation of livestock by wolves is relatively
40 rare (Bradley et al. 2015; DeCesare et al. 2018), and it is anticipated that wolves in Colorado are most likely to
41 prey primarily upon the large population of elk (Colorado Wolf Management Plan TWG 2004).

42 **Habitat Preferences.** Wolves are habitat generalists and can inhabit many types of ecosystems if sufficient prey
43 populations are available, and they are able to spatially separate from humans to avoid conflict (Sazatornil et al.
44 2016; Mech 2017; Mech et al. 2019). Colorado has vast areas of ecologically suitable habitat for wolves (Carroll
45 et al. 2006); however, the areas in Colorado with highest habitat suitability (e.g., the northern Western Slope) may

1 also have the lowest human tolerance as a result of livestock grazing and agricultural activity on the land (Carroll
2 et al. 2003; Ditmer et al. 2022).

3 **Mortality.** Wolf mortality may occur from natural causes or as a result of interactions with humans. Natural
4 sources of mortality for wolves include inter-and intraspecific strife and natural causes (e.g., old age, disease,
5 parasites, accidents; Colorado Wolf Management Plan TWG 2004; Murray et al. 2010). Wolves may be killed by
6 other carnivores while competing for prey (Ballard et al. 2003) or from aggressive interactions with other wolves
7 (Cubaynes et al. 2014). Gray wolves in Colorado are likely to be exposed to and affected by viral and bacterial
8 diseases and parasites, including canine distemper, canine parvovirus, rabies, leptospirosis, tularemia,
9 blastomycosis, heartworm, intestinal worms, echinococcosis, sarcoptic mange, lice, and ticks, similar to the rest of
10 their range (Johnson et al. 1994; Mech et al. 2008; Michigan DNR 2015). In other wolf populations, these
11 diseases and parasites are not considered limiting at the population level (Michigan DNR 2015), but they may
12 affect dispersal and colonization of new areas when a high percentage of pups are infected (Mech et al. 2008).

13 Human-caused mortality typically accounts for more than 80 percent of all wolf mortality (Fuller 1989; Murray et
14 al. 2010), and this is expected to be true in Colorado. Depredation of livestock is a primary source of conflict, as
15 is lack of tolerance of wolves in both the United States and Canada (Mech 2017; Morehouse et al. 2018). Areas
16 with a high density of roads have negatively affected wolf persistence by increasing human access (Mladenoff et
17 al. 1995; Kohn et al. 2001; Smith et al. 2010; Hebblewhite and Whittington 2020); the exception being if high
18 road density is near large areas of intact wolf habitat with few or no roads, e.g., wilderness areas or national park
19 units (Mech 1989). Wolf survival in areas of high road density is also affected by landscape features (terrain,
20 topography, cover), traffic, road distribution, and human tolerance (USFWS 1994).

21 **Interactions with Other Species.** Wolves may directly compete with other predators for prey or habitat,
22 including coyote, mountain lion, black bear (*Ursus americanus*), lynx (*Lynx canadensis*), bobcat (*Lynx rufus*), and
23 wolverine (*Gulo gulo*) (CPW 2022b). These predators may kill or be killed by wolves (Ballard et al. 2003;
24 Kortello et al. 2007). In some areas where wolves have been restored, competitors have changed their predation
25 habits or habitat selection to avoid competition with wolves (Smith et al. 2003). When wolves were reintroduced
26 to Yellowstone National Park in 1995 after being absent for approximately 70 years, they were expected to
27 compete with other predators, including coyotes, mountain lions, and grizzly bears for prey resources (Dobson
28 2014). In the absence of wolves during the preceding decades, these predators likely expanded their niche spaces
29 to include spaces vacated by wolves (Bartnick et al. 2013). Because elk and deer populations at Yellowstone were
30 at or near all-time highs when wolves were reintroduced, prey resources were not limited, which likely buffered
31 the effects of interspecific competition among predators in the short term.

32 Eventually, studies on interspecific competition between wolves and mountain lions following the reintroduction
33 of wolves at Yellowstone observed behavior changes in mountain lions in the presence of wolves. Observed
34 changes included avoidance behaviors, changes in prey selection, and shifts in space use (Bartnick et al. 2013).
35 Between wolves and mountain lions, wolves tend to be the dominant predator. Mountain lions tend to avoid areas
36 where wolves are present, which was observed at Yellowstone. After wolves were reintroduced, mountain lions
37 shifted their hunting grounds to higher elevations and used other habitats farther removed from wolf home ranges
38 and kill sites. In addition, mountain lions preyed on a higher proportion of mule deer following the reintroduction
39 of wolves, whereas elk had been their primary prey species in the absence of wolves. This shift in prey selection
40 was likely because of increased mountain lion-mule deer encounters as mountain lions shifted their hunting
41 grounds (Bartnick et al. 2013). This interaction is known as competitive interference. Competition between
42 wolves and grizzly bears was also observed at Yellowstone following the reintroduction of wolves (Ballard et al.
43 2003; Gunther and Smith 2004). However, grizzly bears have been extirpated from Colorado (DMNS 2022).

44 Black bears occur throughout most of the western two-thirds of Colorado (CBI 2011a). Although they are
45 omnivores, black bears are considered to be apex predators in some ecosystems. There have been fewer
46 documented interactions between wolves and black bears compared to other predators. Wolves have been

1 documented to kill black bears on occasion. In the majority of these cases, wolves have outnumbered black bears,
2 giving them a competitive advantage in combat. Wolves were the more dominant species in approximately 70
3 percent of the documented wolf-black bear interactions (Ballard et al. 2003).

4 Interspecific competition with other species, including moose, has been documented in other parts of North
5 America, including at Isle Royale National Park in Michigan, where wolf populations have been restored
6 (McLaren and Peterson 1994, Jost et al. 2005). However, because of the unique characteristics of the Isle Royale
7 ecosystem, interspecific relationships among wolves and other species observed there may have limited
8 applicability to a large, open system like Colorado. Interspecific competition has not yet been documented with
9 wolves and other predators in Colorado.

10 **Wolf Recovery and Ecosystem Response.** As noted above, wolves have been reintroduced or have otherwise
11 experienced recovery in portions of their historic North American range. Notable examples include Yellowstone
12 National Park and central Idaho (USFWS 1994), northern Wisconsin (Callan et al. 2013), Isle Royale National
13 Park in Michigan (McLaren and Peterson 1994), and Banff National Park in Alberta, Canada (Hebblewhite et al.
14 2005). The following discussion provides an overview of the role of wolves in ecosystems and describes
15 ecosystem-level effects that have been documented elsewhere following reintroduction and recovery efforts and
16 which may be expected in Colorado.

17 As an apex predator, wolves can exert a strong top-down influence on the trophic structure of the ecosystems they
18 inhabit (Ripple and Beschta 2012; Dobson 2014). This means that wolves can shape ecosystems by regulating
19 other wildlife populations either directly (e.g., predation) or indirectly (e.g., behavioral modification of prey
20 species and mesocarnivores [predators that occupy mid-levels of food webs]) affecting herbivore abundance,
21 which can in turn influence vegetation communities and drive ecosystem structure (Estes et al. 2011; Ripple and
22 Beschta 2012; Ripple et al. 2014). This process is known as a trophic cascade. Although there are documented
23 examples of trophic cascades, they are a topic of debate in the body of scientific literature because of the many
24 variables and complex interactions that can otherwise affect ecosystem structure.

25 The loss of predation following the removal of an apex predator from a system (e.g., the extirpation of gray
26 wolves in Colorado) can result in mesopredator release and widespread trophic downgrading of ecosystems (Estes
27 et al. 2011). Mesopredator release is a phenomenon that occurs when populations of apex predators are removed
28 from a system, allowing previously suppressed mesopredator populations to expand rapidly. The subsequent
29 increase in mesopredator abundance increases predation pressure on smaller prey species (e.g., small mammals,
30 birds, and reptiles), resulting in population declines of those prey species (Berger and Connor 2008; Ritchie and
31 Johnson 2009). For example, the loss of wolves from Yellowstone National Park resulted in a rapid increase in
32 coyote population, which reduced the population size and decreased the neonatal survival rate of pronghorn
33 because of increased predation pressure by coyotes (Berger and Conner 2008; Barnowe-Meyer et al. 2009).

34 Following reintroduction of wolves at Yellowstone, Merkle et al. (2009) observed wolf-coyote encounters over a
35 12-year period from 1995 to 2007. Wolves were observed to be the more dominant species in interactions with
36 coyotes, with wolves initiating most encounters (Merkle et al. 2009). In most observed encounters, wolves chased
37 coyotes away, but killed them in some encounters. Wolf-coyote interactions decreased over time as the size of the
38 wolf population increased, suggesting that coyotes adapted to the presence of wolves by altering their behaviors
39 or due to a decline in coyote density through dispersion (Merkle et al. 2009). Although wolves do not hunt
40 coyotes as prey, coyotes are reported as the carnivore being most commonly killed by wolves, further
41 demonstrating the need for coyotes to adapt their behaviors in the presence of wolves (Palomares and Caro 1999;
42 Merkle et al. 2009). However, coyotes also benefit from the access to carrion left behind at wolf kill sites (Ballard
43 et al. 2003; Merkle et al. 2009; NPS 2022a). Reintroduction or recovery of wolves can reduce predation pressure
44 on some smaller prey species because wolves can control the populations of coyotes and other predators by
45 competing for resources and causing the more submissive predator to exhibit avoidance behaviors when wolves
46 are present (Ripple and Beschta 2012; Dobson 2014).

1 Additionally, in the absence of an apex predator, populations of their direct prey species (e.g., elk and deer, in the
2 case of wolves) can exceed optimal levels, resulting in reduced population health due to food resource limitation
3 (Dobson 2014, NPS 2022b). Wolves and other apex predators can improve overall prey population health by
4 limiting the spread of disease (e.g., chronic wasting disease in elk and deer and brucellosis in bison) as weaker
5 animals are removed from the population via predation (Dobson 2014). Wolves can shape the structure of
6 vegetative communities by controlling herbivore populations via predation. For example, after wolves were
7 removed from Yellowstone National Park in the early part of the last century, the problem of overgrazing of
8 woody browse by ungulates became so acute that herds of elk, pronghorn, and bison were culled to protect the
9 remaining vegetation (Ripple and Beschta 2012; WDFW 2022). Since 1995, when wolves were reintroduced to
10 Yellowstone, woody browse species such as willow (*Salix* spp.), aspen (*Populus tremuloides*), and cottonwood
11 (*Populus* spp.) have experienced a resurgence in some areas (Ripple and Beschta 2012; Dobson 2014; WDFW
12 2022). The reintroduction of wolves at Yellowstone may have changed the successional state of vegetative
13 communities by facilitating recovery of woody species that may otherwise have not been able to mature due to
14 persistent grazing pressure.

15 The recovery of woody vegetation at Yellowstone is not attributable solely to reduced grazing pressure through
16 herbivore population declines due to wolf predation. Changes in prey behaviors in the presence of apex predators,
17 such as wolves, can also affect the structure of vegetative communities. For instance, following the reintroduction
18 of wolves at Yellowstone, elk changed their feeding habits by avoiding areas where they could readily be
19 ambushed (Dobson 2014). This allowed riparian vegetation to recover, which in turn led to an increase in the
20 abundance and diversity of riparian bird species (Hollenbeck and Ripple 2007; Dobson 2014). The recovery of
21 woody browse species coupled with the reduced elk population also facilitated population increases in beaver
22 (*Castor canadensis*) and bison (Ripple and Beschta 2012).

23 Similar top-down trophic effects on vegetative communities as well as other wildlife species following
24 reintroduction or recovery of wolves have been observed in other ecosystems throughout North America
25 including northern Wisconsin (Callan et al. 2013), Isle Royale National Park in Michigan (McLaren and Peterson
26 1994), and at Canada's Banff National Park in Alberta (Hebblewhite et al. 2005). Although intermediate
27 herbivores and vegetation species vary across examples, it has been shown across ecosystems that wolves can
28 exert a strong influence on ecosystem structure and dynamics by regulating populations and behaviors of other
29 species (Estes et al. 2011; Ripple and Beschta 2012; Dobson 2014). Wilmsers and Schmitz (2016) reported that
30 changes in ecosystem dynamics following wolf reintroduction may be significant enough to measurably affect
31 carbon cycling at the ecosystem level through increases in net ecosystem productivity.

32 **3.2.2 Other Federally Listed Species**

33 Colorado is home to 38 federally listed species, including the gray wolf (USFWS 2022c). Some federally listed
34 species are found throughout the state, while others have limited distribution or occur only in specific habitats.
35 Table 3-3 lists the federally listed mammals and birds that occur in Colorado along with their statuses and
36 provides a summary of their habitat preferences. Table 3-3 also notes in which of the 21 focal counties these
37 species are known to occur or likely to occur. Table 3-3 does not include federally listed fishes, insects, and plants
38 that may occur in Colorado because the proposed action is not likely to affect these species.

39 Colorado also contains critical habitat for 14 federally listed species. Table 3-4 lists designated critical habitat in
40 Colorado and indicates in which of the 21 counties in the study area critical habitat is located. Critical habitat is
41 designated based on the presence of primary constituent elements. Primary constituent elements are those specific
42 elements of physical and biological features that provide for a species' life-history processes and are essential to
43 the conservation of the species. As noted above, the proposed action is not expected to affect federally listed
44 fishes, insects, and plants; therefore, critical habitats for these species are not included in table 3-4.

1 **Table 3-3. Federally Listed Species in Colorado**

Common Name	Scientific Name	Status	Habitat Requirements	Occurrence in the Study Area
Mammals				
Black-footed ferret	<i>Mustela nigripes</i>	Endangered	Black-footed ferret occurs in semi-arid grasslands and is closely associated with occupied prairie dog habitat.	Distribution is limited to northern Colorado, including Larimer, Moffat, and Rio Blanco Counties in the study area.
Canada lynx	<i>Lynx canadensis</i>	Threatened	In the continental United States, Canada lynx occurs in subalpine and boreal/hardwood forests. Lynxes prefer areas with deep snow and high populations of their key prey, snowshoe hares.	Canada lynx distribution includes portions of all 21 counties in the study area.
Mexican Wolf	<i>Canis lupus baileyi</i>	Endangered/ Nonessential Experimental Population	The Mexican wolf occupies mountainous woodlands and deserts. It has been extirpated throughout much of its historic range.	Mexican wolf is not known to occur in Colorado but may have occurred in the state historically. Populations currently exist in the neighboring states of New Mexico and Arizona where it was reintroduced beginning in the late 1990s.
New Mexico meadow jumping mouse	<i>Zapus hudsonius luteus</i>	Endangered	The New Mexico meadow jumping mouse inhabits riparian and wetland zones, particularly scrub-shrub and persistent emergent herbaceous wetlands. The New Mexico meadow jumping mouse nests in dry soils.	Distribution is limited to southern Colorado, including La Plata and Archuleta Counties in the study area.
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	Threatened	Preble's meadow jumping mice inhabit riparian areas and wet meadows with dense ground cover. They typically hibernate in burrows at the base of vegetation.	Within the study area, Preble's meadow jumping mouse only occurs in Larimer County.
Birds				
Eastern black rail	<i>Laterallus jamaicensis ssp. jamaicensis</i>	Threatened	The Eastern black rail occurs in dense emergent marshes and beaver ponds.	Distribution in the study area is limited to Grand, Jackson, and Larimer Counties.
Gunnison sage-grouse	<i>Centrocercus minimus</i>	Threatened	Gunnison sage-grouse are dependent on sagebrush-dominated habitats.	Distribution in the study area includes portions of Delta, Dolores, Gunnison, Mesa, Montezuma, Montrose, Ouray, Saguache, and San Miguel Counties.

Common Name	Scientific Name	Status	Habitat Requirements	Occurrence in the Study Area
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Mexican spotted owls inhabit mixed conifer forests, pine-oak forests, and rocky canyons. Nesting typically occurs in Douglas-fir trees, forests with high canopy closure, caves, or on cliff ledges.	Distribution is widespread throughout the western half of Colorado. The Mexican spotted owl occurs in all counties in the study area except Saguache.
Piping plover	<i>Charadrius melodus</i>	Threatened	In Colorado, piping plover habitat is limited to sandy reservoir shores and gravel pits.	Distribution in Colorado is limited to Bent, Crowley, Kiowa, Otero, and Prowers Counties in the southeastern portion of the state. The species does not occur in the study area.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Southwestern willow flycatchers are typically found in shrubby floodplains and other riparian areas with dense shrubs and open water. The species is closely associated with willows, tamarisk, and Russian olive trees.	Species distribution is concentrated in the lower southwest portion of Colorado, including Archuleta, Dolores, La Plata, Mesa, Montezuma, Ouray, Saguache, and San Miguel Counties in the study area.
Whooping crane	<i>Grus americana</i>	Endangered	Whooping cranes live in mudflats in agricultural areas and around mudflats. They nest in wetlands dominated by bulrush.	Distribution is limited to north-central Colorado. In the study area, whooping cranes could occur in Grand, Jackson, Larimer, and Routt Counties. However, whooping cranes have not been seen in Colorado since 2010.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Threatened	Yellow-billed cuckoos in Colorado are considered riparian obligates and are closely associated with areas where cottonwoods form the upper-story.	Species distribution in Colorado is primarily in the western portion of the state, including Archuleta, Delta, Dolores, Eagle, Garfield, Grand, Gunnison, Jackson, La Plata, Mesa, Moffat, Montezuma, Montrose, Ouray, Rio Blanco, Routt, Saguache, and San Miguel Counties in the study area.

1 Source: USFWS 2022c,d

1 **Table 3-4. Critical Habitat in Colorado**

Species	Description of Critical Habitat	Overlap with Focal Counties
Gunnison sage-grouse	Critical habitat was designated on November 20, 2014 (79 FR 69311 69363). The designation covers 1,429,551 acres of primarily sagebrush habitats.	Critical habitat in Colorado is located in parts of Delta, Dolores, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, and San Miguel Counties. Critical habitat for this species overlaps with the study area in Delta, Dolores, Gunnison, Mesa, Ouray, Saguache, and San Miguel Counties.
Mexican spotted owl	Critical habitat was designated on August 31, 2004 (69 FR 53182 53298). The designation covers approximately 8.6 million acres of canyon and forest habitat.	Critical habitat in Colorado includes portions of El Paso, Teller, Fremont, Custer, Pueblo, Huerfano, Douglas, and Jefferson Counties. Critical habitat for this species overlaps with the study area in Custer and Huerfano Counties.
New Mexico meadow jumping mouse	Critical habitat was designated on April 15, 2016 (81 FR 14264). The designation covers 13,973 acres along 169.3 miles of flowing streams, ditches, and canals as critical habitat in eight units.	Critical habitat in Colorado is limited to portions of Las Animas, Archuleta, and La Plata Counties in the extreme southern portion of the state. Critical habitat for this species overlaps with the study area in Archuleta and La Plata Counties.
Preble's meadow jumping mouse	Critical habitat was designated on December 15, 2010 (75 FR 78430 78483). The area encompasses 662 kilometers of rivers and streams and 34,935 acres.	Critical habitat was designated in parts of Boulder, Broomfield, Douglas, El Paso, Jefferson, Larimer, and Teller Counties. Critical habitat for this species overlaps with the study area in Larimer County.
Southwestern willow flycatcher	Critical habitat was designated on January 3, 2013 (78 FR 344 534). About 1,975 stream kilometers and the adjacent flood-prone and 100-year floodplains were designated as critical habitat for a total area of 208,973 acres.	Critical habitat in Colorado is limited to Alamosa, Conejos, Costilla, and La Plata Counties in the southern part of the state. Critical habitat for this species overlaps with the study area in La Plata County.
Yellow-billed cuckoo	Critical habitat was designated on April 21, 2021 (86 FR 20798 21005). Approximately 298,845 acres in Arizona, California, Colorado, Idaho, New Mexico, Texas, and Utah were designated as critical habitat.	Critical habitat in Colorado is limited to Mesa and Delta Counties. Critical habitat for this species overlaps with the study area in Mesa and Delta Counties.

2 Source: USFWS 2022c,d

3.2.3 State-Listed Species

Seventy-four species are listed as endangered, threatened, or candidate species at the State level in Colorado (CPW 2022c). CPW designates State-listed species in accordance with Colorado’s Nongame, Endangered, or Threatened Species Conservation Act. Federally listed species occurring in Colorado are also assigned a State-level designation. Therefore, there is considerable overlap between the lists of federally and Colorado State-listed species.

In addition to those species protected under the Colorado Nongame, Endangered, or Threatened Species Conservation Act, many others are considered SGCN. Colorado’s most recent SWAP identifies 159 vertebrate animal and mollusk species and 76 non-mollusk invertebrates as SGCN. The SWAP also identifies 117 plant species as Plants of Greatest Conservation Need. Colorado’s SWAP groups species into one of two categories based on conservation priority within the state: Tier 1 and Tier 2. Tier 1 species are considered to be of higher conservation priority than Tier 2 (CPW 2015). Colorado’s SGCN list includes species listed as endangered or threatened at the federal or State level.

Colorado’s Tier 1 SGCN list of vertebrate animal and mollusk species includes 55 species consisting of 13 mammals, 13 birds, 25 fishes, 2 reptiles, and 2 amphibians. Tier 2 contains 104 species, including 23 mammals, 48 birds, 2 fishes, 14 reptiles, 8 amphibians, and 9 mollusks. Tier 2 also contains all 76 non-mollusk invertebrate species, including 1 arachnid; 2 beetles; 6 bumble bees; 27 butterflies, skippers, and moths; 3 caddisflies; 16 damselflies and dragonflies; 15 mayflies, 1 mydas fly; and 4 stoneflies. Of the 76 Plants of Greatest Conservation Need, 43 are Tier 1, and 74 are Tier 2 (CPW 2015).

Habitats in western Colorado consist of large expanses of sagebrush and juniper shrublands, grasslands and prairies, forests and woodlands, and some alpine habitats (CNHP n.d.). Of Colorado’s 159 State-listed and other SGCN vertebrate animal and mollusk species, those that are known to occur or may occur within the study area include 3 amphibians, 14 birds, 10 mammals, 4 reptiles, 20 fishes, and 1 mollusk. State-listed and other SGCN that could occur in the 21-county study area, along with their statuses, are listed below in table 3-5. Fishes and mollusks are not included in table 3-5 because the proposed action is not likely to affect these species.

Table 3-5. State-Listed Species in the Study Area

Common Name	Scientific Name	Status
Amphibians		
Boreal toad	<i>Bufo boreas</i>	State Endangered
Northern leopard frog	<i>Rana pipiens</i>	State Special Concern
Wood frog	<i>Rana sylvatica</i>	State Special Concern
Birds		
American peregrine falcon	<i>Falco peregrinus anatum</i>	State Special Concern
Bald eagle	<i>Haliaeetus leucocephalus</i>	State Special Concern
Burrowing owl	<i>Athene cunicularia</i>	State Threatened
Columbian sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>	State Special Concern
Ferruginous hawk	<i>Buteo regalis</i>	State Special Concern
Greater sage-grouse	<i>Centrocercus urophasianus</i>	State Special Concern
Greater sandhill crane	<i>Grus canadensis tabida</i>	State Special Concern
Gunnison sage-grouse	<i>Centrocercus minimus</i>	Federally Threatened, State Special Concern
Least tern	<i>Sterna antillarum</i>	State Endangered
Long-billed curlew	<i>Numenius americanus</i>	State Special Concern

Common Name	Scientific Name	Status
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Federally Threatened, State Threatened
Mountain plover	<i>Charadrius montanus</i>	State Special Concern
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Federally Endangered, State Endangered
Western yellow-billed cuckoo	<i>Coccyzus americanus</i>	State Special Concern, Federally Threatened
Mammals		
Black-footed ferret	<i>Mustela nigripes</i>	Federally Endangered, State Endangered
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	State Special Concern
Kit fox	<i>Vulpes macrotis</i>	State Endangered
Lynx	<i>Lynx canadensis</i>	Federally Threatened, State Endangered
Northern pocket gopher	<i>Thomomys talpoides macrotis</i>	State Special Concern
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	Federally Threatened, State Threatened
River otter	<i>Lontra canadensis</i>	State Threatened
Swift fox	<i>Vulpes velox</i>	State Special Concern
Townsend's big-eared bat	<i>Corynorhinus townsendii pallescens</i>	State Special Concern
Wolverine	<i>Gulo gulo</i>	State Endangered
Reptiles		
Triploid checkered whiptail	<i>Cnemidophorus neotesselatus</i>	State Special Concern
Midget faded rattlesnake	<i>Crotalus viridis concolor</i>	State Special Concern
Longnose leopard lizard	<i>Gambelia wislizenii</i>	State Special Concern
Common garter snake	<i>Thamnophis sirtalis</i>	State Special Concern

1 Source: CPW 2015

2 **3.3 OTHER WILDLIFE SPECIES**

3 Wolves are apex predators, meaning that they occupy the top trophic level in food webs. The introduction or
4 reintroduction of wolves into ecosystems can affect other wildlife species and various aspects of the natural
5 environment. This section focuses on prey species most likely to be affected by reintroduced gray wolves—either
6 directly, through predation, or indirectly through behavioral changes.

7 **3.3.1 Elk and Deer**

8 Elk, mule deer, and white-tailed deer are the most critical prey species for wolves in the northern Rocky
9 Mountains (Smith et al. 2004). At Yellowstone National Park in Wyoming and in portions of Montana and Idaho,
10 NPS (2022b) reports that elk comprise up to 90 percent of the diet of wolves during winter months. Elk and deer
11 are abundant in Colorado. Based on the most recent population estimates (2021), Colorado's statewide elk
12 population was 308,901 (CPW 2021a) and the statewide deer population was 416,426 (CPW 2021b). Among prey
13 species preferred by wolves, elk and deer are also the species with the highest densities in Colorado (Colorado
14 Wolf Management Plan TWG 2004).

15 Elk and deer travel in herds and use a variety of habitats throughout the state. The density of these species in a
16 given location changes seasonally based on environmental conditions and food availability (Singleton 1995, as

1 cited in Ditmer et al. 2022). Snow cover is a driver of seasonal elk and deer movement in Colorado because they
2 seek out areas with less snow cover that provide better access to vegetation (Paquet et al. 1996, as cited in Ditmer
3 et al. 2022). Modeling has shown that the density of elk and mule deer is highest in the Western Slope region of
4 Colorado, north of Interstate 70 during summer and winter. This contributes to the high suitability of northwestern
5 Colorado for wolf reintroduction (Ditmer et al. 2022).

6 **3.3.2 Other Ungulates**

7 Wolves also prey upon a variety of other ungulates, such as pronghorn (*Antilocapra americana*) and wild sheep
8 (*Ovis* spp.), and even large animals such as bison (*Bison bison*) and moose.

9 Like elk and deer, pronghorn are medium-sized ungulates that make easy prey for wolves. Wolf predation on
10 pronghorn at Yellowstone National Park has been closely documented for decades, but overall predation rates
11 have been low (Barnowe-Meyer et al. 2009). The range of pronghorn in Colorado is more expansive in the
12 Eastern Plains region; however, pronghorn also occur in limited portions of the Western Slope including
13 northwestern Colorado (CBI 2011b) in the study area. Although their population has been steadily increasing in
14 recent decades, pronghorn are considerably less abundant in Colorado than elk and deer with an estimated
15 statewide population of 78,182 in 2021 (CPW 2021c).

16 Bison are an important source of prey for wolves in the northern Rocky Mountains despite being more difficult to
17 kill than other prey (Smith et al. 2000, MacNulty et al. 2014). Bison are the largest of the species preyed upon by
18 wolves and are widely considered to be the most formidable. A 2014 study of wolf predation at Yellowstone
19 National Park found that bison were on average three times more difficult for wolves to kill than elk. The study
20 also showed that wolves are more successful at preying on bison when they hunted in larger groups (MacNulty et
21 al. 2014). Once extirpated in Colorado, wild bison were reintroduced in Larimer County, approximately 30 miles
22 north of Fort Collins, Colorado, in 2015. This collaborative effort among Larimer County, the City of Fort
23 Collins, the United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service, and
24 Colorado State University, was known as the Laramie Foothills Bison Conservation Herd Project. The project was
25 intended to reintroduce a previously extirpated native species and restore native prairie habitat (CSU 2019;
26 Wilkins et al. 2019). Bison are currently managed in the state as livestock, rather than wildlife. Currently, there
27 are no bison in northwestern Colorado. However, the range of bison in Colorado may expand in the future if
28 reintroduction efforts are successful and populations continue to grow.

29 In some areas, wolves are known to prey on moose, particularly calves (McLaren and Peterson 1994). Moose
30 were rarely observed in Colorado until the late 1970s when CPW transplanted moose from Utah and Wyoming to
31 the North Park region near Walden. Moose are less abundant than most other prey species in Colorado.
32 Colorado's statewide moose population was estimated at 3,505 in 2021, and CPW manages them as a game
33 species (CPW 2021d). Moose distribution in Colorado is concentrated in the northern portion of the Front Range
34 and along the Western Slope, including northwestern Colorado (CBI 2011c) and in the study area.

35 Wolves also prey opportunistically on wild sheep including Rocky Mountain bighorn sheep. Two subspecies of
36 bighorn sheep are native to Colorado, both of which were nearly extirpated from the state as a result of hunting,
37 loss of habitat, and disease introduced from domestic sheep. Rocky Mountain bighorn sheep were reintroduced
38 into central Colorado in the 1950s. They are now abundant in the state, with an estimated population of 7,000
39 animals. They spend summer in high-elevation (>8,000 feet) mountains and move to lower elevations in winter to
40 forage and escape heavy snow. Desert bighorn sheep live in the canyon country of western Colorado. They were
41 reintroduced to Colorado National Monument in the 1970s, and the most recent population estimate is
42 approximately 550 individuals (CPW 2020c). Wolves have not been reported as a meaningful source of mortality
43 in bighorn sheep populations (Sawyer and Lindzey 2002). This is likely because bighorn sheep are highly
44 effective at avoiding predation using a variety of behavioral strategies (Wishart 2000, as cited in Sawyer and
45 Lindzey 2002). Bighorn sheep also inhabit rugged alpine terrain, making hunting difficult for wolves.

1 Mountain goats, a non-native species, were introduced to Colorado from Montana between the 1940s and 1970s
 2 as a game animal; in 2020, the population was estimated to number 1,600 individuals (CPW 2020d). Mountain
 3 goats live at high elevations year-round, although some migrate to lower elevations in winter where there is more
 4 shelter from heavy snow. Wolves in Colorado likely have limited encounters with mountain goats in these high-
 5 elevation habitats.

6 **3.4 TRIBAL CULTURAL RESOURCES**

7 Various Native American groups have occupied western Colorado for at least the last 12,000 years. A detailed
 8 history of occupation is provided in Appendix C. The affected environment for Tribal cultural resources focuses
 9 on archaeological and historical sites and natural resources of importance to the Tribes located in the focal
 10 counties for analysis (figure 2-1) that could be impacted by a regulatory framework, as well as Tribal treaty rights
 11 pertaining to hunting and for reservations.

12 [Preparer’s note – this section will be updated to include information on Tribes that request government-to-
 13 government consultation. For all of the section below, the discussion currently focuses on the Southern Ute Indian
 14 Tribe and Ute Mountain Ute Tribe. Based on information received from the Service, the Pawnee Nation also
 15 requested government-to-government consultation. The OAHP database (see table below) was not reviewed for
 16 sites related to the Pawnee Nation.]

17 **3.4.1 Archaeological and Historical Sites**

18 A review of the Colorado Office of Archaeological and Historic Preservation (OAHP) Compass database
 19 identified 1,677 Ute archaeological and historical sites within the focal counties. Of these, 780 are eligible for the
 20 National Register of Historic Places. These sites preserve important elements of Ute history and culture and/or
 21 have the potential to yield more information about Ute history through further research.

22 Appendix C includes a summary of the types of sites (e.g., prehistoric or historic and habitation, architectural,
 23 rock art) by county, roughly from north to south within the focal counties. Some sites have multiple cultural
 24 components or periods and thus are listed in more than one category (i.e., some double-counting may occur). The
 25 total numbers of archaeological and historical sites by site type are provided in table 3-6.

26 **Table 3-6. Total Ute Archaeological Sites by Type**

Site Type ¹	Site Period	Total Number of Sites in Focal Counties	Number of Sites among the Total in Focal Counties that are Eligible for the National Register of Historic Places
Animal Capture/Remains	Historic	3	1
Burial	Historic	7	1
Burial	Prehistoric	6	5
Burial	Unknown	2	1
Cairn	Historic	1	1
Cambium Tree	Prehistoric	172	117
Cambium Tree	Unknown	1	0
Camp	Historic	98	47
Carving Rock or Wood	Historic	1	1

Site Type¹	Site Period	Total Number of Sites in Focal Counties	Number of Sites among the Total in Focal Counties that are Eligible for the National Register of Historic Places
Carving Rock or Wood Cambium Tree	Historic	1	1
Corral	Unknown	1	0
Defense	Historic	5	3
Farming/Ranching	Historic	24	11
Habitation	Historic	36	21
Historic Animal Capture/Remains	Historic	1	1
Historic Burial (Cemetery)	Historic	1	1
Historic Cambium Tree	Historic	1	1
Historic Camp	Historic	2	0
Historic Habitation	Historic	7	7
Historic Recreation	Historic	1	0
Isolated Feature	Prehistoric	83	4
Isolated Feature, Cambium Tree	Historic	11	4
Isolated Feature, Rock Art	Unknown	1	1
Isolated Find	Historic	14	5
Isolated Find	Prehistoric	160	9
Isolated Find	Unknown	3	0
Kill Site	Prehistoric	1	0
Logging	Historic	2	1
Mining	Historic	2	1
Open Architectural	Historic	5	2
Open Architectural	Prehistoric	282	189
Open Architectural	Unknown	4	0
Open Architectural, Historic Structure/Foundation/Alignment	Historic	5	4
Open Camp	Prehistoric	393	192
Open Camp	Unknown	2	0
Open Lithic	Prehistoric	172	37
Open Lithic, Cambium	Prehistoric	1	0
Quarry	Prehistoric	11	6
Railroad	Historic	1	1
Recreation	Historic	1	0
Road/Trail	Historic	28	21
Road/Trail	Multicomponent	3	2

Site Type ¹	Site Period	Total Number of Sites in Focal Counties	Number of Sites among the Total in Focal Counties that are Eligible for the National Register of Historic Places
Rock Art	Historic	55	44
Rock Art	Prehistoric	98	76
Sheltered Architectural	Prehistoric	26	21
Sheltered Camp	Prehistoric	45	27
Sheltered Lithic	Prehistoric	3	3
Structure/Foundation/Alignment-Unspecified (Government Building)	Historic	1	1
Structure/Foundation/Alignment-Unspecified	Historic	23	17
Trail/Road	Historic	3	0
Trash Dump	Historic	35	18
Water Control	Historic	5	3

1 ¹ Tables for each county are provided in Appendix C.

2 **3.4.2 Natural Resources of Cultural Importance**

3 Resources of cultural importance to the Ute include wildlife within the state of Colorado. For example, the Ute
4 Mountain Ute and Southern Ute honor the bear in the bear dance (Southern Ute Tribe 2022; see Appendix C). The
5 bear dance was derived from a story in which two men witnessed a bear dancing while they were hunting. The
6 story noted that the bear taught the men to dance, along with a corresponding song. The bear also instructed the
7 men to teach the dance and song to their people. The bear is believed to be one of the wisest animals and one that
8 has magical powers. The Southern Ute believe that bears understand the relationship with the Ute and that the
9 dance solidifies this relationship (Anaya 2010).

10 Animals of importance to the Pawnee include buffalo, bear, beavers, wolves, birds of prey, and deer. The buffalo
11 was important for its use for food and clothing (Grinnell 1893). The Pawnee believed that while the buffalo was
12 hunted, its consent was needed (White 1982). It was among the most respected animals of the Pawnee. The bear
13 and beaver were regarded for wisdom and power, while wolves were noted for their craft, and birds of prey were
14 noted for their courage and fierceness. Deer stood for their fleetness (Grinnell 1893).

15 **3.4.3 Tribal Treaty Rights and Reservations**

16 “Treaty-protected rights to [the] use of and access to natural and cultural resources are an intrinsic part of Tribal
17 life and are of deep cultural, economic, and subsistence importance to tribes” (DOI 2021). The purpose of some
18 treaties with Tribes are to protect not only the right to access natural resources, but also the resources themselves
19 (DOI 2021).

20 “Under the U.S. Constitution, treaties are part of the supreme law of the land, with the same legal force and effect
21 as federal statutes. Pursuant to this principle, and its trust relationship with federally recognized Tribes, the United
22 States has an obligation to honor the rights reserved through treaties, including rights to both on and, where
23 applicable, off-reservation resources, and to ensure that its actions are consistent with those rights and their
24 attendant protections” (DOI 2021). While the signing of treaties generally ended in 1871, federal treaties with
25 Tribes ratified by Congress remain in effect as law (ACHP 2018).

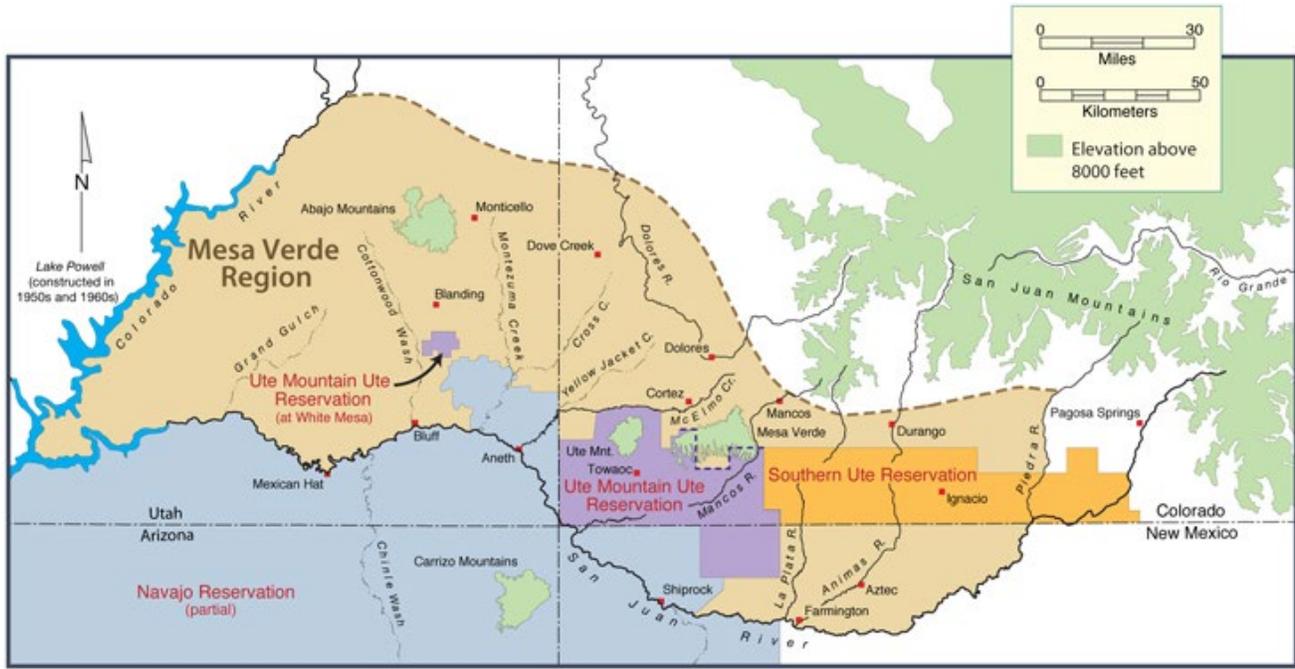
1 Hunting and gathering have long been important in Ute culture (Denison 2019; Givón 2011; Simmons 2000;
2 Janetski 1992; Jones 1955, as cited in Appendix C). The Ute are distinguished in part from their neighboring
3 Pueblo groups by their focus on hunting and animals over farming and plants in several aspects of life, including
4 social organization, ceremonies, subsistence strategies, and resource procurement and production. The Utes also
5 were among the first indigenous groups in North America to acquire and master the horse. The horse allowed the
6 Utes to travel farther distances for their subsistence than was previously possible. They expanded the seasonal
7 circuits within their traditional territory, venturing as far east as the panhandles of Texas and Oklahoma (which
8 expanded their Aboriginal or ancestral lands to include areas outside traditional band territories) (see Appendix C,
9 and figure 1 in Appendix C).

10 However, over time, the Ute territory was greatly reduced by actions of the U.S. government, growing trade
11 requirements, and American settlement, particularly following the transfer of Alta, California, after the Mexican-
12 American War (1846–1848). Following these events, numerous treaties and agreements between the Ute and the
13 U.S. government were established. Among these are the Calhoun Treaty, signed in 1849; the Hunt Treaty of 1868,
14 also known as the Treaty with the Ute, 1868; and the Brunot Agreement, initiated in 1874. These treaties and
15 agreements resulted in land cessions and constraints on the traditional practices of the Ute, as well as establishing
16 reservations (figure 3-1). Reservations refer to “land reserved for a tribe (or multiple Tribes) under treaty, statute,
17 or other agreement with the United States that establishes permanent Tribal homelands” (Fitzpatrick 2021).
18 Appendix C provides a discussion of these and other treaties and agreements between the Ute and U.S.
19 government.

20 The treaties and agreements between Tribal and federal governments reduced the land holdings of the Ute, but did
21 provide provisions for hunting and gathering, including on what is today federal lands (USFWS 2022e; NPS
22 2016; Nie 2008, see Appendix C). When maintaining traditional cultural practices, hunting and gathering is
23 allowed on certain lands, on which these activities may be prohibited uses for non-Tribal members.

24 One of these area is the “Brunot Area.” The Brunot Area consists of approximately 3.7 million acres within the
25 San Juan Mountain region within the state of Colorado (Southern Ute Indian Tribe 2021). As cited in the United
26 Forest Service *San Juan National Forest Land and Resource Management Plan*, “Article II of the Bruno
27 Agreement specified that ‘the United States shall permit the Ute Indians to hunt upon said lands so long as the
28 game lasts and the Indians are at peace with the white people’” (U.S. Forest Service 2021). The Southern Ute
29 Indian Tribe has an agreement with the State of Colorado to exercise hunting and fishing rights in this location;
30 the Southern Ute Indian Tribe entered into this agreement with the State in 2008 (Southern Ute Indian Tribe
31 2021). The Ute Mountain Ute Tribe’s hunting rights were acknowledged in 1978 as part of a consent decree that
32 gave enrolled members of the Ute Mountain Ute Tribe the right to hunt deer and elk in the Brunot Area for
33 subsistence, religious, or ceremonial purposes (U.S. Forest Service 2021).

34 Wildlife conservation is subject to the jurisdiction of the Southern Ute Indian Tribe on their reservation. Wildlife
35 on the reservation is considered property of the Tribe, unless privately owned (Ayala 2010). “Southern Ute Tribal
36 members may hunt any type of wildlife not limited by regulation, i.e., big game, at any time without a license or
37 permit” (Ayala 2010).



1

2 ©University of Colorado Law School. Used with Permission

3 **Figure 3-1. Boundaries of Ute Mountain Ute and Southern Ute Reservations**

4 **3.5 SOCIOECONOMIC RESOURCES**

5 NEPA requires an analysis of impacts on the human environment, which includes economic, social, and
 6 demographic elements in the affected area. The region of influence for this socioeconomic analysis is the state of
 7 Colorado because the proposed 10(j) rule would apply to the entire state. While the introduction of wolves to
 8 Colorado could have socioeconomic impacts throughout the entire state, the 21 focal counties are likely to
 9 experience the greatest economic and social impacts. The following sections describe the current human
 10 environment, which includes the economic, social, and demographic elements in Colorado and the focal counties.
 11 Due to the possibility of social and economic impacts from wolf reintroduction, an evaluation of human activities
 12 in the 21-county focus area and the state of Colorado is necessary to determine primary economic drivers in the
 13 region and how the different management options analyzed in this document related to the wolf reintroduction
 14 could result in socioeconomic impacts.

15 **3.5.1 Human Activity in Colorado**

16 Ditmer et al. (2022) identified potential factors for predicting socio-ecological suitability of habitats for wolf
 17 introduction, including land ownership (private versus public), livestock-dense areas, and the social tolerance of
 18 wolves. Ditmer et al. identified that wolf-human conflicts are most associated with human-dominated landscapes
 19 (with greater roads/traffic densities) and human activities such as tourism, outdoor recreation, and agriculture.

20 **Population**

21 Table 3-7 provides the population counts for the state of Colorado and for the 21 focal counties. Between 2010
 22 and 2020, the population of the 21 counties grew by 10.96 percent from 822,554 to 912,734 people, making up
 23 15.8 percent of the state’s total population in 2020 (U.S. Census Bureau 2020). By comparison, the population of
 24 Colorado grew by 14.8 percent from 5,029,196 to 5,773,714 people in that same period. The 21 counties are more

1 sparsely populated than the state as a whole, as shown in table 3-7. Most of the population in these 21 counties
 2 lives in communities centered around ski and mountain resorts or towns along major highways such as Interstate
 3 70. Table 3-8 shows population density.

4 **Table 3-7. Population Summary**

Geographic Area	2010	2020	% Change 2010–2020	Most Populous Community	Community Population (2020)
Colorado	5029196	5773714	14.80%	Denver	715,522
21 Counties Combined	822584	912734	10.96%	Fort Collins	169,810
Archuleta County	12,084	13,359	10.55%	Pagosa Springs	1,571
Custer County	4,255	4,704	10.55%	Silver Cliff	609
Delta County	30,952	31,196	0.79%	Delta City	9,035
Dolores County	2,064	2,326	12.69%	Dove Creek	635
Eagle County	52,197	55,731	6.77%	Gypsum	8,040
Garfield County	56,389	61,685	9.39%	Rifle	10,437
Grand County	14,843	15,717	5.89%	Granby	2,079
Gunnison County	15,324	16,918	10.40%	Gunnison	6,560
Huerfano County	6,711	6,820	1.62%	Walsenburg	3,049
Jackson County	1,394	1,379	-1.08%	Walden	606
La Plata County	51,334	55,638	8.38%	Durango	19,071
Larimer County	299,630	359,066	19.84%	Fort Collins	169,810
Mesa County	146,723	155,703	6.12%	Grand Junction	65,560
Moffat County	13,795	13,292	-3.65%	Craig	9,060
Montezuma County	25,535	25,849	1.23%	Cortez	8,766
Montrose County	41,276	42,679	3.40%	Montrose	20,291
Ouray County	4,436	4,874	9.87%	Ridgway	1,183
Rio Blanco County	6,666	6,529	-2.06%	Meeker	2,374
Routt County	23,509	24,829	5.61%	Steamboat Springs	13,224
Saguache County	6,108	6,368	4.26%	Saguache	539
San Miguel County	7,359	8,072	9.69%	Telluride	2,607

5 Source: U.S. Census 2010, 2020, 2020e

6

1 **Table 3-8. Land Use Summary**

Geographic Area	Land Area (mi ²)	2020 Population Density (pop/mi ²)
Colorado	104,177	55.42
21 Counties Combined	44,474	20.52
Archuleta County	1,350	9.90
Custer County	739	6.37
Delta County	1,142	27.32
Dolores County	1,067	2.18
Eagle County	1,692	32.94
Garfield County	2,956	20.87
Grand County	1,870	8.40
Gunnison County	3,239	5.22
Huerfano County	1,591	4.29
Jackson County	1,614	0.85
La Plata County	1,690	32.92
Larimer County	2,596	138.32
Mesa County	3,329	46.77
Moffat County	4,743	2.80
Montezuma County	2,029	12.74
Montrose County	2,241	19.04
Ouray County	541	9.01
Rio Blanco County	3,221	2.03
Routt County	2,368	10.49
Saguache County	3,169	2.01
San Miguel County	1,287	6.27

2 Source: U.S. Census 2020, Colorado State Land Board n.d., U.S. Forest Service 2010

3 **Employment**

4 Saguache County has the highest unemployment rate of the 21 counties in the study area at 9.80 percent, while
 5 Dolores County has the lowest unemployment rate. Saguache, Rio Blanco, and Grand Counties all have
 6 unemployment rates higher than the State as a whole. Huerfano County has the highest poverty rate in the study
 7 area, at 19.90 percent; Saguaches County has the second highest poverty rate. Twelve counties in the 21-county
 8 study area have poverty rates above Colorado’s poverty rate of 9.8 percent. On average, the poverty rate across
 9 the 21 county study area is 11.04 percent, higher than the state’s poverty rate (U.S. Census Bureau 2022).

10 Table 3-9 shows employment and income characteristics for the 21 counties—all of which have an unemployment
 11 rate lower than the overall Colorado unemployment rate of 4.6 percent, except for Grand, Rio Blanco, Routt, and
 12 Saguache Counties. Eagle County has the highest median household income which is \$85,877 while Huerfano
 13 County has the lowest median household income, which is \$40, 255.

1 **Table 3-9. Employment Summary**

Geographic Area	Unemployment Rate	Poverty Rate	Median Household Income	Percent Employed in Tourism-Related Sectors
Colorado	4.60%	9.80%	\$75,231	10.40%
Archuleta County	4.30%	9.40%	\$55,658	22.50%
Custer County	4.10%	12.20%	\$60,361	12.10%
Delta County	3.30%	12.10%	\$47,968	17.6%
Dolores County	2.00%	12.50%	\$56,786	26.40%
Eagle County	3.90%	9.20%	\$85,877	26.60%
Garfield County	4.00%	7.60%	\$75,435	12.50%
Grand County	5.00%	9.10%	\$71,769	22.00%
Gunnison County	2.20%	9.60%	\$60,557	26.40%
Huerfano County	2.30%	19.90%	\$40,255	19.10%
Jackson County	3.60%	11.60%	\$46,157	23.90%
La Plata County	2.50%	10%	\$69,291	17.50%
Larimer County	3.40%	9.90%	\$76,366	16.80%
Mesa County	4.30%	11.10%	\$57,157	19.20%
Moffat County	3.20%	9.90%	\$54,583	19.80%
Montezuma County	2.50%	12.90%	\$50,717	22.40%
Montrose County	3%	10.40%	\$54,611	17.40%
Ouray County	2.40%	6.70%	\$68,893	14.80%
Rio Blanco County	5.80%	9.80%	\$54,247	20.20%
Routt County	3.90%	9.50%	\$76,198	18.70%
Saguache County	9.80%	18.60%	\$45,231	15.80%
San Miguel County	3.00%	8.90%	\$64,478	21.50%

2 Source: American Community Survey 2016-2020

3 The primary industries in the 21-county study area are in the tourism-related sector of Arts, Entertainment,
 4 Recreation, Accommodation, and Food Services; and Educational Services, Health Care, and Social Assistance
 5 (U.S. Census Bureau 2022).

6 **3.5.2 Industry Sectors in Colorado**

7 **Tourism**

8 Tourism is an essential component of Colorado’s economy and of the economy in the 21-county study area. On
 9 average, travelers spent \$19.0 billion in the state of Colorado each year from 2011 to 2020, generating \$2.37
 10 billion annually in tax revenue (Dean Runyan Associates 2021). As of April 2022, tourism-related sectors
 11 employed over 339,000 people in Colorado, or 11.0 percent of the 2.85 million workers in the state. Leisure and
 12 Hospitality employment experienced a 22.3 percent 10-year increase from April 2012 to April 2022, compared to
 13 a 24.0 percent 10-year increase across all sectors (BLS 2022). In 2020, activities directly tied to tourism and travel
 14 generated \$866.3 million in local tax revenue from travel and tourism across all counties in Colorado (Dean
 15 Runyan Associates 2022). Tourism in the 21-county study area is largely tied to outdoor recreation, which is
 16 discussed in section 3.7, Recreation.

1 A group including seven to eight wolves currently resides in Jackson County, one of the focal counties. Because
 2 the wolves were found in Jackson County relatively recently, no data are available on the economic impacts of
 3 these wolves on tourism or other sectors of the county’s economy. Jackson County describes itself as “the Moose
 4 Viewing Capital of Colorado,” and tourism associated with wildlife viewing in the Arapaho National Wildlife
 5 Refuge and the North Park Basin contributes to the local economy (Jackson County n.d.).

6 **Outdoor Recreation**

7 According to data from the Bureau of Economic Analysis, outdoor recreation contributed \$12.2 billion and
 8 149,000 jobs to Colorado in 2019, and \$9.6 billion and 120,000 jobs in 2020. For comparison, the economic
 9 output of outdoor recreation activities nationwide was \$834 billion in 2019 and \$689 billion in 2020, with 5.2
 10 million jobs in 2019 and 4.3 million jobs in 2020 (Office of Economic Development and International Trade
 11 2021). CPW estimated the economic contributions of activities associated with outdoor recreation to be
 12 significantly greater, representing \$62.5 billion and 511,059 jobs across the entire state in 2017—\$14.9 billion
 13 and 133,658 of these jobs were in the northwest region of the state, which includes multiple focal counties (CPW
 14 2018a).

15 Skiing and snowboarding make up a significant portion of Colorado’s tourism and outdoor recreation sectors,
 16 generating more than \$4.8 billion annually. Ski-related activities bring more than 7 million tourists to the state
 17 annually; these tourists support the local economies of mountain communities, including the western portion of
 18 the potential release area (Colorado Ski Country USA 2015). Much of this ski tourism is concentrated in the Vail
 19 Valley of Eagle County, which includes the resort communities of Vail and Beaver Creek. These areas draw
 20 hundreds of thousands of skiers in the winter and substantial summer crowds, although the nature of tourism is
 21 quite seasonal (Vail Valley Economic Development n.d.).

22 Hunting contributed \$843 million (related to trip and equipment expenditures) and 7,937 jobs to the state in 2017,
 23 of which \$136 million and 1,488 jobs were in the northwest region, while wildlife watching contributed \$2.44
 24 billion and 13,243 jobs to the state, of which \$161 million and 1,283 jobs were in the northwest region. Big game
 25 hunting is particularly important to the northwest region of the state; of the 1,608,611 hunter-days in the state in
 26 2017, 760,237 were in the northwest region (CPW 2018b).

27 **Agriculture and Livestock Grazing**

28 The numbers of farms and farm workers in each of the 21 counties in the study area, as well as in the entire state
 29 of Colorado, are provided in table 3-10. The proportion of people who work on farms in the 21county study area
 30 is roughly twice that of the state of Colorado, with particularly high proportions of farm workers in Dolores,
 31 Jackson, Custer, and Huerfano Counties. Table 3-11 provides an economic summary of agricultural production in
 32 each of the 21 counties and the state of Colorado, including total agricultural sales and the average per farm net
 33 income. Saguache County has the highest average per farm net income followed by Jackson County, both of
 34 which are greater than the state. Huerfano, La Plata, Routt, and Archuleta Counties have negative average farm
 35 incomes.

36 **Table 3-10. Agricultural Summary**

Geographic Area	Number of Farms	Number of Farm Workers	Farm Workers (% of Population)	Average Farm Area (Acres)
Colorado	38,893	69,032	1.20%	818
21 Counties Combined	14,798	26,467	2.82%	510
Archuleta County	399	727	5.44%	527
Custer County	315	553	11.76%	512
Delta County	1615	2898	9.29%	147

Geographic Area	Number of Farms	Number of Farm Workers	Farm Workers (% of Population)	Average Farm Area (Acres)
Dolores County	313	549	23.60%	504
Eagle County	257	431	0.77%	604
Garfield County	661	1,217	1.97%	719
Grand County	290	541	3.44%	831
Gunnison County	309	572	3.38%	864
Huerfano County	437	773	11.33%	1331
Jackson County	131	258	18.71%	2301
La Plata County	1093	1981	3.56%	503
Larimer County	2043	3699	1.03%	236
Mesa County	2465	4378	2.81%	139
Moffat County	462	797	6.00%	2063
Montezuma County	1123	1991	7.70%	615
Montrose County	1135	1917	4.49%	291
Ouray County	122	184	3.78%	698
Rio Blanco County	320	591	9.05%	1284
Routt County	887	1,629	6.56%	524
Saguache County	288	538	8.45%	1090
San Miguel County	133	243	3.01%	1023

1 Source: U.S. Department of Agriculture 2019

2 **Table 3-11. Agricultural Economic Summary**

Geographic Area	Average Annual Agricultural Sales (\$1,000)	Average Annual Sales per Farm (\$1,000)	Average Farm Income (\$)
Colorado	7,491,702	192.6	29,669
Archuleta County	11,157	27,963	-5,291
Custer County	9,680	30,731	6,537
Delta County	67,117	41,558	9,054
Dolores County	8,516	27,208	8,207
Eagle County	8,243	32,074	223
Garfield County	35,863	54,255	7,104
Grand County	14,440	49,792	5,707
Gunnison County	24,117	78,047	11,341
Huerfano County	13,186	30,174	-1,300
Jackson County	24,487	186,923	71,134
La Plata County	24,352	22,280	-2,541
Larimer County	150,717	73,772	5,555
Mesa County	94,186	38,209	5,634
Moffat County	33,138	71,728	19,950
Montezuma County	46,424	41,340	7,541

Geographic Area	Average Annual Agricultural Sales (\$1,000)	Average Annual Sales per Farm (\$1,000)	Average Farm Income (\$)
Montrose County	81,226	71,565	8,817
Ouray County	4,204	34,463	2,242
Rio Blanco County	52,047	62,034	6,417
Routt County	31,647	35,679	-2,694
Saguache County	105,403	365,983	113,532
San Miguel County	6,374	47,923	6,309

1 Source: U.S. Department of Agriculture 2019

2 **3.6 ENVIRONMENTAL JUSTICE**

3 The U.S. Environmental Protection Agency (USEPA) defines environmental justice as “the fair treatment and
4 meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the
5 development, implementation, and enforcement of environmental laws, regulations, and policies” (USEPA 2022).
6 Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-
7 Income Populations*, issued in 1994 by President Clinton, directs federal agencies to identify and address any
8 disproportionately high and adverse human health or environmental effects of their programs, policies, or
9 activities on minority or low-income populations.

10 **3.6.1 Methodology**

11 The Service assessed the potential for the proposed action and alternatives to result in disproportionately high and
12 adverse effects on minority or low-income populations following recommendations made in the 2016 report,
13 *Promising Practices for EJ Methodologies in NEPA Reviews* (Federal Interagency Working Group on
14 Environmental Justice & NEPA Committee 2016). In addition to these environmental justice communities, the
15 analysis considers the potential for disproportionately high and adverse effects on two populations of concern,
16 low-income and minority livestock producers and outfitters. Existing conditions and potential effects on
17 American Indian Tribes are discussed in sections 3.4 and 4.6, respectively.

18 The Service assessed potential environmental justice effects within the statewide study area as well as the 21 focal
19 counties. Data for minority and low-income populations and populations of concern were collected at the county
20 level, taking into consideration the programmatic nature of the proposed action, which could result in effects
21 across the entire state of Colorado. These data were compared to data for the reference geography, the state, to
22 determine which minority or low-income communities may have environmental justice concerns. The reference
23 community is a larger geographic unit or population that is used as a point of comparison to identify minority or
24 low-income communities in the geographic unit of analysis. When addressing the issue of environmental justice,
25 low-income and minority populations that meet certain thresholds relative to the reference community are
26 considered environmental justice communities that may be disproportionately affected by the proposed action and
27 alternatives.

28 Data from the U.S. Census Bureau were used to define minority and low-income populations. Minority
29 populations were defined based on 2020 decennial census data. For the purposes of this analysis, minorities are
30 defined as individuals who identify themselves as one or more of the following races or ethnicities: Black or
31 African American, American Indian or Alaska Native, Asian, Native Hawaiian, or Hispanic or Latino.

32 Minority environmental justice communities were identified using both the 50 percent and “meaningfully greater”
33 analyses. If the aggregate minority population (including all minority and Hispanic or Latino individuals) in a
34 county exceeded 50 percent of the total population, an environmental justice community was identified in that

1 county. When the majority of the population in a given geographic area identifies as a race other than white or as
2 Hispanic or Latino, that population is classified as a “majority-minority” population. Separately, the
3 “meaningfully greater” analysis requires use of a reasonable, subjective threshold (e.g., 5 percent or 10 percent
4 greater than the reference community). What constitutes “meaningfully greater” varies by agency. For this
5 analysis, “meaningfully greater” is defined as a minority population that exceeds the minority population in the
6 reference community (i.e., the state of Colorado) by more than 5 percent. This threshold is large enough to take
7 into account natural variations in demographic populations within a community.

8 Data from the U.S. Census Bureau’s (2020) American Community Survey 5-year estimates were used to identify
9 low-income populations. Low-income populations are defined using the percent of all individuals for whom
10 poverty status has been determined, as defined by the U.S. Census Bureau, for each specific geographic area.
11 Poverty status is a measure of an individual or household’s financial ability to meet basic living needs. Poverty
12 status is calculated by the U.S. Census Bureau and varies based on the number of individuals in a household. In
13 2020, the poverty line ranged from \$13,171 for a single individual to \$50,035 for a family of nine or more (U.S.
14 Census Bureau 2020). Low-income environmental justice communities were identified by comparing the
15 percentage of individuals with incomes below the poverty level in each county to the percentage of individuals
16 with incomes below the poverty level at the state level. If the percentage in the county is greater than the
17 percentage in the reference community, a low-income environmental justice community was identified.

18 **3.6.2 Existing Conditions**

19 The population of Colorado is predominately white, with people who identify as minority races or as Hispanic or
20 Latino making up approximately 35 percent of the state’s population. People who identify as Hispanic or Latino
21 make up the largest minority population across the state and in most of the focal counties. Statewide, 20 of
22 Colorado’s 64 counties are home to Hispanic/Latino populations that are meaningfully greater than (i.e., over 5
23 percent greater than) the percentage of Hispanic/Latino individuals at the state level. In two of these counties,
24 Conejos and Costilla on Colorado’s southern border with New Mexico, Hispanic/Latino individuals make up over
25 50 percent of the county’s population. These two counties are considered to have majority-minority
26 Hispanic/Latino communities. Of the 21 focal counties within the study area, four counties—Eagle, Garfield,
27 Huerfano, and Saguache—have Hispanic/Latino populations that are meaningfully greater than the percentage of
28 Hispanic/Latino individuals at the state level. Based on these data, the Hispanic/Latino populations in 20 counties
29 in the study area were identified as environmental justice communities.

30 In addition, in Arapahoe County in the north-central part of Colorado, 10.4 percent of the county’s population
31 identified as Black or African American in the 2020 decennial census. This percentage is over 5 percent greater
32 than the number of people identifying as Black or African American at the state level (3.8 percent). While
33 Arapahoe County is not a focal county, this population was identified as an environmental justice population.

34 One focal county, Montezuma County, has a greater percentage of American Indian individuals than any other
35 minority group. The Ute Mountain Ute Tribe’s reservation, including the reservation headquarters of Towaoc, is
36 partially within Montezuma County. Existing conditions specific to this Tribe and other American Indian Tribes
37 in the study area are discussed in section 3.4. For the purposes of the environmental justice analysis, the American
38 Indian population in Montezuma County is considered an environmental justice community.

39 The total percentage of minorities in 15 counties, including one focal county, Saguache County, is meaningfully
40 greater than the total percentage of minorities at the state level. All of these counties contain environmental justice
41 communities that have been identified above, including Hispanic/Latino and African American communities.

42 In 2020, 9.8 percent of individuals in Colorado had incomes below the poverty line. Of the 64 counties in the
43 state, 41 (or approximately two-thirds) had percentages of individuals living below the poverty line that were
44 greater than the percentage at the state level, including 12 of the focal counties. Low-income environmental

1 justice communities have been identified in these counties. These counties are located across the state in both
2 urban and rural areas. In most, but not all cases, counties with meaningfully greater minority populations also had
3 higher percentages of low-income individuals than the state.

4 Environmental justice communities identified in the statewide study area and focal counties are listed in table
5 3-12 and shown in figures 3-2 and 3-3. Minority and low-income populations meeting the criteria for
6 environmental justice communities as discussed above are bolded in table 3-12. Highlighted rows represent focal
7 counties, and bold text indicates an environmental justice community.

1 **Table 3-12. Environmental Justice Communities in Colorado and the Focal Counties**

Geographic Area	Percent of Individuals Identifying as Minority or Hispanic/Latino							Total Percent Minority	Percent Of Individuals Below Poverty Level
	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic/Latino		
Colorado	3.8	0.6	3.4	0.2	0.5	4.5	21.9	34.9	9.8
Adams County	3.1	0.6	4.3	0.1	0.5	3.7	41.7	53.9	9.9
Alamosa County	1.3	1.3	0.9	0.1	0.6	3.0	47.0	54.3	18.5
Arapahoe County	10.4	0.4	6.4	0.2	0.5	5.1	20.7	43.8	7.8
Archuleta County	0.3	1.3	0.8	< 0.1	0.6	4.7	16.2	23.8	8.3
Baca County	0.5	1.1	0.2	0	1.1	4.1	9.9	16.8	18.1
Bent County	4.5	1.6	0.7	0	0.1	3.2	31.2	41.3	21.3
Boulder County	1.0	0.3	4.9	< 0.1	0.6	4.5	14.6	25.9	11.2
Broomfield County	1.3	0.3	6.9	0.1	0.5	4.9	13.4	27.3	5.0
Chaffee County	1.5	0.7	0.7	< 0.1	0.5	3.9	9.5	16.8	11.6
Cheyenne County	< 0.1	0.3	0.2	0	0.2	3.4	11.8	15.9	13.1
Clear Creek County	0.5	0.4	0.9	< 0.1	0.4	4.1	6.9	13.3	6.2
Conejos County	0.2	0.6	0.3	< 0.1	0.3	1.5	50.7	53.6	20.8
Costilla County	0.9	1.0	1.6	0	0.4	4.1	56.8	64.7	26.6
Crowley County	8.6	2.5	1.2	< 0.1	< 0.1	2.3	27.2	41.9	26.8
Custer County	0.2	0.9	0.5	0	1.0	4.1	3.8	10.5	7.6
Delta County	0.4	0.4	0.8	< 0.1	0.6	4.1	13.9	20.2	18.1
Denver County	8.5	0.5	3.8	0.2	0.5	4.2	27.9	45.7	11.9
Dolores County	0.8	1.5	0.3	0.2	0.2	5.6	7.6	16.2	6.9
Douglas County	1.3	0.3	5.5	< 0.1	0.4	4.9	9.5	22.1	3.2
Eagle County	0.5	0.2	1.3	< 0.1	0.3	2.4	30.2	35.0	9.2
Elbert County	0.5	0.4	0.7	< 0.1	0.5	4.8	7.9	14.9	4.8
El Paso County	5.6	0.5	3.0	0.4	0.6	6.3	17.8	34.2	9.8
Fremont County	3.7	1.4	0.7	< 0.1	0.5	4.3	12.4	22.9	13.2

Geographic Area	Percent of Individuals Identifying as Minority or Hispanic/Latino							Total Percent Minority	Percent Of Individuals Below Poverty Level
	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic/Latino		
Garfield County	0.4	0.5	0.6	< 0.1	0.5	3.5	31.7	37.4	7.6
Gilpin County	0.6	0.6	1.5	< 0.1	0.6	4.9	6.5	14.7	5.5
Grand County	0.4	0.4	0.5	0.1	0.5	2.9	9.8	14.5	9.1
Gunnison County	0.5	0.4	0.7	< 0.1	0.7	4.0	9.5	15.7	12.4
Hinsdale County	1.0	0.8	0.3	0.1	0.8	5.3	3.8	12.1	10.2
Huerfano County	0.8	1.1	0.4	0	0.7	3.8	31.2	38.0	16.2
Jackson County	0	0.9	0.1	0.1	0.4	4.3	10.0	15.8	9.1
Jefferson County	1.1	0.5	3.0	< 0.1	0.5	4.4	15.7	25.3	6.7
Kiowa County	0.2	0	0.6	< 0.1	< 0.1	5.6	7.2	13.8	13.6
Kit Carson County	0.3	0.3	0.4	< 0.1	0.5	3.7	19.9	25.1	7.4
Lake County	0.4	0.6	0.8	0.1	0.6	3.9	35.8	42.3	13.5
La Plata County	0.3	5.0	0.7	< 0.1	0.7	4.4	12.6	23.8	10.3
Larimer County	1.0	0.4	2.3	< 0.1	0.5	4.6	12.4	21.3	11.1
Las Animas County	1.3	1.0	0.7	< 0.1	0.6	2.9	38.7	45.3	18.2
Lincoln County	4.8	1.1	0.7	0.4	0.4	3.4	14.3	25.1	13.6
Logan County	3.5	0.7	0.6	< 0.1	0.2	2.7	16.3	24.1	10.8
Mesa County	0.7	0.6	1.0	0.1	0.6	4.5	15.0	22.4	13.0
Mineral County	0	0.5	0.3	0	0	4.2	5.4	10.4	14.9
Moffat County	0.6	0.7	0.4	< 0.1	0.5	4.3	16.0	22.4	17.8
Montezuma County	0.3	12.2	0.5	< 0.1	0.4	4.7	12.0	30.2	12.4
Montrose County	0.4	0.6	0.8	< 0.1	0.4	3.7	21.2	27.1	12.3
Morgan County	3.2	0.4	0.5	< 0.1	0.3	2.4	36.3	43.2	10.8
Otero County	0.7	0.6	0.5	0.1	0.6	2.7	41.2	46.4	22.2
Ouray County	0.3	0.3	0.6	< 0.1	0.5	3.9	6.0	11.6	6.7
Park County	0.5	0.7	0.6	< 0.1	0.5	4.9	7.1	14.3	7.0
Phillips County	0.2	0.3	0.5	< 0.1	0.1	1.7	25.5	28.3	8.0

Geographic Area	Percent of Individuals Identifying as Minority or Hispanic/Latino							Total Percent Minority	Percent Of Individuals Below Poverty Level
	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic/Latino		
Pitkin County	0.5	0.2	1.6	< 0.1	0.5	3.1	10.9	16.9	5.7
Prowers County	0.7	1.0	0.3	< 0.1	0.4	2.9	39.0	44.3	16.1
Pueblo County	1.8	0.7	0.9	< 0.1	0.6	3.5	41.6	49.1	17.6
Rio Blanco County	0.4	0.8	0.3	< 0.1	0.4	4.1	9.5	15.6	10.7
Rio Grande County	0.4	1.2	0.3	< 0.1	0.5	3.3	39.9	45.7	15.5
Routt County	0.6	0.3	0.7	0.1	0.4	3.5	8.9	14.4	9.5
Saguache County	0.3	1.3	1.0	< 0.1	0.7	3.0	37.6	43.8	16.2
San Juan County	0.1	0.9	0.3	0	0.1	4.3	12.8	18.4	16.3
San Miguel County	0.2	0.6	0.7	0	0.5	3.3	10.9	16.3	10.4
Sedgwick County	0.1	0.4	0.5	0	0.3	3.1	15.1	19.6	20.0
Summit County	0.7	0.2	1.3	< 0.1	0.5	3.4	17.2	23.4	7.5
Teller County	0.5	0.5	0.8	< 0.1	0.6	5.5	6.9	14.9	9.2
Washington County	0.5	0.2	0.3	0.2	0.4	3.5	10.7	15.8	12.3
Weld County	1.3	0.4	1.7	< 0.1	0.4	3.6	29.9	37.4	10.3
Yuma County	0.2	0.2	0.3	< 0.1	0.3	1.8	27.7	30.4	11.4

1 Source: U.S. Census Bureau 2020a-d

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2
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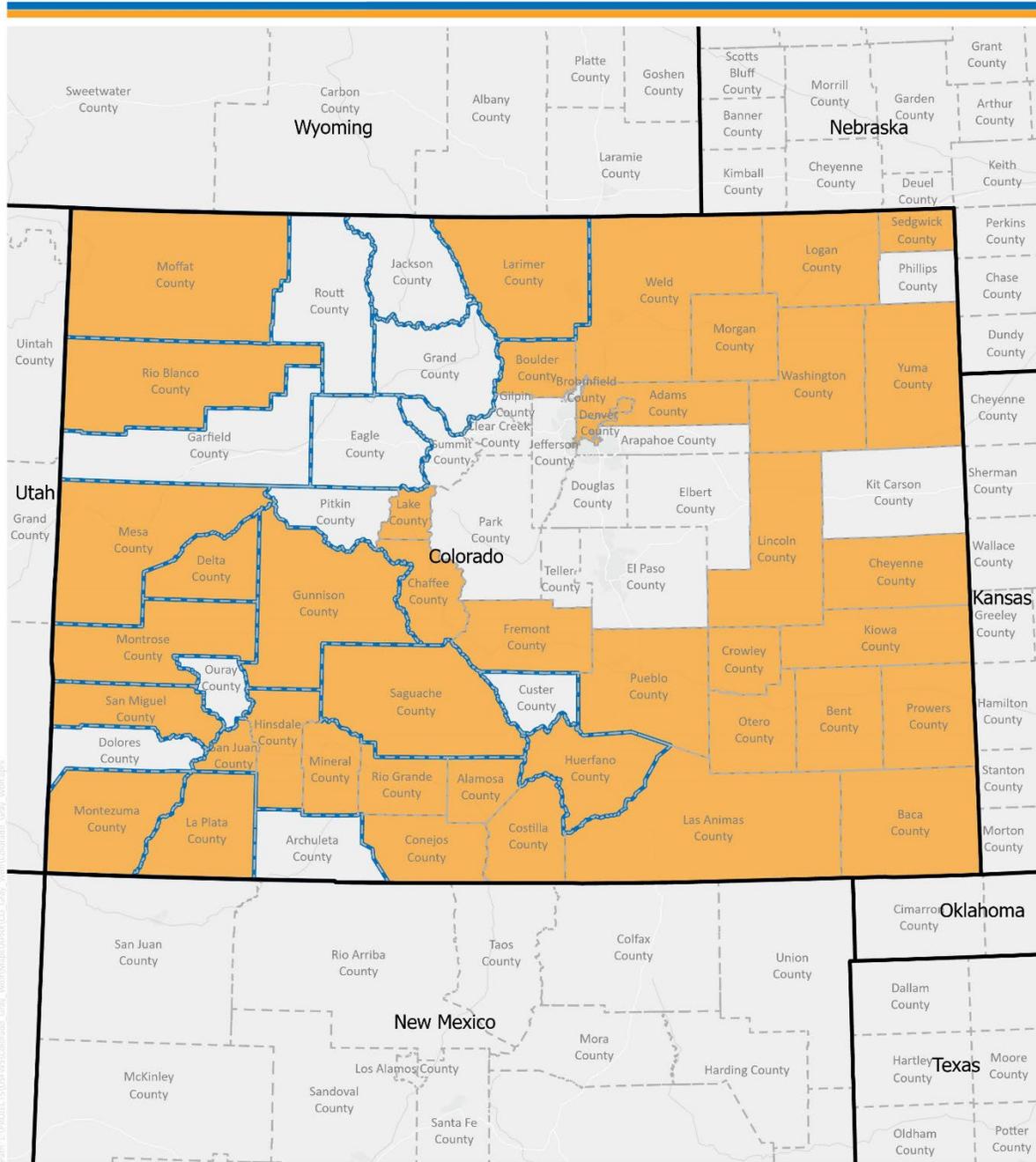


Figure 3-3
 Low-Income Environmental Justice
 Communities in the Statewide Study
 Area and Focal Counties
 Colorado
 September 2022
Colorado Gray Wolf 10(j) Rulemaking EIS

1 Low-income and minority individuals employed in livestock production or as outfitters or guides are addressed in
 2 this environmental justice analysis as specific population groups of concern. Demographic and income data for
 3 livestock producers in Colorado were obtained from the 2017 USDA Census of Agriculture (see table 3-13). The
 4 Census of Agriculture collects data on all agricultural producers in the state, including producers of row crops,
 5 field crops, and livestock. Table 3-13 includes data on all agricultural producers in the study area and is used as a
 6 conservative proxy for data on livestock producers. Demographic and income data specific to livestock producers
 7 were not publicly available as of September 2022. Highlighted rows represent focal counties and bold text
 8 indicates an environmental justice community.

9 Minority environmental justice communities within the agricultural population group of concern were identified
 10 using the “meaningfully greater” analysis. If the percentage of minority producers or producers of Hispanic,
 11 Latino, or Spanish origin exceeds the percentage at the state level by more than 5 percent, these communities are
 12 considered environmental justice communities. Six counties in the state, including two focal counties, are home to
 13 producers of Hispanic, Latino, or Spanish origin that meet the threshold for environmental justice communities.
 14 Two counties in the study area, Denver and Kiowa Counties, neither of which are focal counties, have populations
 15 of minority producers that meet the threshold for environmental justice communities.

16 The 2017 Census of Agriculture does not provide poverty data for agricultural producers. Low-income
 17 environmental justice communities within this population group of concern were identified by comparing average
 18 farm-related income and the percent change in farm-related income over the five-year period between 2012 and
 19 2017 to data at the state level. Low-income environmental justice communities were identified if a county’s
 20 agricultural producers had average farm-related incomes below the average income at the state level or if there
 21 was a decrease in farm-related income of over 5 percent between 2012 and 2017. Under these criteria, 41 counties
 22 were identified as low-income environmental justice communities. Of those counties, 12 are focal counties:
 23 Archuleta, Delta, Dolores, Gunnison, Huerfano, La Plata, Larimer, Mesa, Moffat, Montezuma, Montrose, and
 24 Saguache.

25 **Table 3-13. Agricultural Producer Environmental Justice Population Group of Concern**

Geographic Area	Total Producers	Total Minority Producers	% Minority Producers	Producers of Hispanic, Latino, Spanish Origin	% Producers of Hispanic, Latino, Spanish Origin	Farm-Related Income (Per Farm Average)	% Change In Income Since 2012 (Per Farm Average)
Colorado	69,032	1,601	2%	3,765	5%	23,036	+1
Adams County	1,568	55	4%	133	8%	33,960	-18
Alamosa County	507	16	3%	60	12%	25,993	-22
Arapahoe County	1,516	79	5%	91	6%	13,677	-14
Archuleta County	727	43	6%	93	13%	13,113	+50
Baca County	1,092	18	2%	22	2%	43,014	+15
Bent County	473	17	4%	24	5%	23,149	-60
Boulder County	1,788	43	2%	70	4%	34,915	+156
Broomfield County	60	0	0%	0	0%	no data ¹	no data ¹
Chaffee County	506	15	3%	17	3%	65,300	+312
Cheyenne County	633	1	0%	7	1%	24,234	-47

Geographic Area	Total Producers	Total Minority Producers	% Minority Producers	Producers of Hispanic, Latino, Spanish Origin	% Producers of Hispanic, Latino, Spanish Origin	Farm-Related Income (Per Farm Average)	% Change In Income Since 2012 (Per Farm Average)
Clear Creek County	54	0	0%	0	0%	1,599	-83
Conejos County	879	33	4%	328	37%	27,630	+117
Costilla County	372	12	3%	268	72%	56,414	+91
Crowley County	456	15	3%	42	9%	10,804	-14
Custer County	553	9	2%	6	1%	25,305	+97
Delta County	2,898	65	2%	123	4%	15,862	+106
Denver County	20	3	15%	0	0%	no data ¹	no data ¹
Dolores County	549	5	1%	7	1%	7,388	+30
Douglas County	2,174	73	3%	76	3%	24,322	+50
Eagle County	431	1	0%	24	6%	35,377	+303
Elbert County	2,963	113	4%	113	4%	14,279	-8
El Paso County	2,421	93	4%	89	4%	18,556	+73
Fremont County	1,805	29	2%	119	7%	7,305	+70
Garfield County	1,217	24	2%	28	2%	36,317	+228
Gilpin County	64	2	3%	0	0%	63,124	+521
Grand County	541	5	1%	6	1%	36,853	-2
Gunnison County	572	6	1%	21	4%	14,567	+76
Hinsdale County	68	0	0%	0	0%	12,625	+36
Huerfano County	773	28	4%	180	23%	6,729	-32
Jackson County	258	5	2%	9	3%	55,191	+146
Jefferson County	1,121	21	2%	19	2%	52,808	+116
Kiowa County	645	5	83%	10	2%	30,602	-58
Kit Carson County	1,044	5	0%	15	1%	29,748	-50
Lake County	68	0	0%	4	6%	10,290	no data ¹
La Plata County	1,981	50	3%	163	8%	8,133	+11
Larimer County	3,699	104	3%	130	4%	17,689	+16
Las Animas County	957	44	5%	189	20%	21,600	+54
Lincoln County	903	7	1%	7	1%	18,840	-47

Geographic Area	Total Producers	Total Minority Producers	% Minority Producers	Producers of Hispanic, Latino, Spanish Origin	% Producers of Hispanic, Latino, Spanish Origin	Farm-Related Income (Per Farm Average)	% Change In Income Since 2012 (Per Farm Average)
Logan County	1,524	7	0%	38	2%	20,131	-23
Mesa County	4,378	83	2%	215	5%	7,456	+44
Mineral County	32	0	0%	0	0%	17,194	-75
Moffat County	797	8	1%	11	1%	18,053	-15
Montezuma County	1,991	69	3%	126	6%	9,758	+27
Montrose County	1,917	13	1%	72	4%	6,366	-1
Morgan County	1,302	29	2%	65	5%	24,526	+14
Otero County	772	40	5%	64	8%	15,199	-35
Ouray County	184	5	3%	10	5%	40,130	+164
Park County	496	25	5%	22	4%	16,004	+66
Phillips County	609	0	0%	2	0%	34,160	-45
Pitkin County	201	0	0%	2	1%	8,483	-33
Prowers County	785	12	2%	12	2%	20,444	-48
Pueblo County	1,469	17	1%	116	8%	11,277	-3
Rio Blanco County	591	12	2%	8	1%	24,494	+16
Rio Grande County	585	9	2%	33	6%	33,490	+30
Routt County	1,629	23	1%	68	4%	30,665	+78
Saguache County	538	19	4%	52	10%	32,894	-28
San Juan County	no data ¹	no data ¹	no data ¹	no data ¹	no data ¹	no data ¹	no data ¹
San Miguel County	243	0	0%	1	0%	27,701	+103
Sedgwick County	378	8	2%	5	1%	28,434	-20
Summit County	119	4	3%	2	2%	10,809	+59
Teller County	284	8	3%	7	2%	9,851	+294
Washington County	1,279	13	1%	27	2%	23,277	-22
Weld County	7,232	135	2%	285	4%	32,065	+57
Yuma County	1,341	14	1%	29	2%	32,257	-30

1 Source: U.S. Department of Agriculture 2019

2 ¹ "No data" indicates that data is not available or was not disclosed by the USDA to avoid disclosing data for individual
3 operations.

1 Demographic and income data for outfitters and guides were not publicly available or through the state of
2 Colorado or other cooperating agencies as of September 2022. Therefore, the impacts analysis for this population
3 group of concern in Chapter 4 is qualitative, based on the lack of available information.

4 All American Indian Tribes are also considered population groups of concern for environmental justice. One
5 county with an American Indian environmental justice community, Montezuma County, has been identified based
6 on the data shown in table 3-12. Section 3.4 identifies American Indian Tribes with Tribal trust land within the
7 study area and Tribes that have asked to be consulted during the NEPA process, including the Ute Mountain Ute,
8 Southern Ute, and Pawnee Nation. These Tribes or their members are engaged in livestock production and
9 hunting and could potentially be affected by the proposed action and alternatives, including the no-action
10 alternative. Section 3.4 provides additional discussion of consultation with these American Indian Tribes and
11 identified concerns.

12

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This “Environmental Consequences” chapter analyzes the beneficial and adverse impacts that would result from implementation of any of the alternatives considered in this EIS. The resource topics presented in this chapter correspond to the descriptions of existing conditions in Chapter 3. As required by CEQ regulations implementing NEPA, this chapter provides a comparison of the environmental consequences for each alternative.

4.2 GENERAL METHODOLOGY FOR ASSESSING IMPACTS

The following analysis evaluates direct, indirect, and cumulative impacts to the human environment (i.e., physical, natural, cultural, and socioeconomic resources) from the proposed implementation of a regulatory framework, requested by the State of Colorado for its gray wolf reintroduction efforts. The approach includes the following elements:

- Focusing the analysis to the greatest extent possible on management changes and associated issues that could have meaningful impacts on the resources or values being evaluated.
- Using general analysis methods and assumptions that follow CEQ and U.S. Department of the Interior regulations and guidance.

The potential for significant impacts from management activities are assessed and described in each resource topic as applicable.

4.3 GENERAL ANALYSIS METHODOLOGY AND ASSUMPTIONS

The interdisciplinary planning team reviewed a substantial body of scientific literature and studies applicable to the state of Colorado and associated resources. This information augmented observations and documentation gathered by the cooperating agencies for this effort. When available, the methodology notes other resource-specific data, observations, or studies for each impact topic. The analysis focuses on expected environmental impacts related to the implementation of a regulatory framework to address Colorado’s gray wolf reintroduction efforts. As such, the analysis focuses on the impacts of providing, or not providing, regulatory flexibility for the State’s reintroduction efforts. Issues related to the reintroduction process, including should reintroduction occur, where it should occur, how many wolves would be reintroduced, and how a compensation program run by the State would function are part of the State planning effort and outside the scope of the analysis for this EIS.

4.3.1 Assessing Impacts Using Council on Environmental Quality Criteria

According to the CEQ NEPA regulations (40 CFR 1500–1508), effects or impacts mean changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and include the following:

- (1) Direct effects, which are caused by the action and occur at the same time and place.
- (2) Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
- (3) Cumulative effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency

1 (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually
2 minor but collectively significant actions taking place over a period of time.

3 (4) Effects include ecological (such as the effects on natural resources and on the components, structures, and
4 functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct,
5 indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and
6 detrimental effects, even if on balance the agency believes that the effects will be beneficial.

7 **4.3.2 Assumptions**

8 The following guiding assumptions were used to provide context for this analysis.

9 **Analysis Period.** This EIS establishes what management tools would be available under a regulatory framework
10 to address Colorado’s plan to reintroduce the gray wolf. For all action alternatives, it is assumed that the need for
11 regulatory flexibility would be less in the initial reintroduction phases and increase as populations are established.
12 Short- and long-term impacts are defined under each resource area, but in general, short-term impacts are
13 expected in the first 3 to 5 years of reintroduction activities and long-term impacts would be 5 years and beyond.
14 Management may continue into the future without additional NEPA analysis as long as there no “substantial
15 changes in the proposed action that are relevant to environmental concerns; or ... significant new circumstances
16 or information relevant to environmental concerns and bearing on the proposed action or its impacts” (40 CFR
17 1502.9(c)).

18 **Analysis Area.** The area of analysis generally focuses on the state of Colorado. For the action alternatives
19 (alternatives 1 and 2) focal counties are identified that are assumed to have suitable habitat for potential release
20 locations or locations wolves may migrate to after release based on xxxxxx (state study ref here). These focal
21 counties are identified in Chapter 2, figures 2-1 and 2-2.

22 **Duration and Type of Impacts.** Duration describes the length of time over which an effect may occur. For
23 example, impacts could occur over minutes, days, months, or years. The analysis includes a description of the
24 timeframe over which impacts are expected to occur. Type describes the classification of the impact as beneficial
25 or adverse:

- 26 ▪ **Beneficial.** A change in the condition or appearance of the resource that moves the resource toward a
27 desired condition.
- 28 ▪ **Adverse.** A change in the condition or appearance of the resource that moves the resource away from a
29 desired condition or detracts from its appearance or condition.

30 **4.3.3 Jurisdiction and Compliance**

31 The Service is the lead agency for this planning process, whereas NPS, the Bureau of Land Management, the U.S.
32 Forest Service, USDA, CPW, State of Colorado Department of Agriculture, State of Utah, State of Arizona, State
33 of New Mexico, State of Wyoming, Moffat County, Garfield County, Delta County, Mesa County, Jackson
34 County, Montrose County, Delores County, and the White River and Douglas Creek Conservation Districts are
35 participating as cooperating agencies. The Service has jurisdiction over the implementation of the ESA, including
36 the conservation of listed species such as the gray wolf. [Note: Section updated on 9/28/22, will be updated
37 further in subsequent drafts.]

1 **4.4 SPECIES OF SPECIAL CONCERN**

2 **4.4.1 Gray Wolf**

3 The following analysis considers the environmental consequences of the management options being considered
4 for the wolf population following the reintroduction of wolves in Colorado. The environmental consequences
5 were evaluated by assuming each alternative would be implemented starting in 2023, when wolves are
6 reintroduced (as per commitments in Colorado State statute 33-2-105.8). In all alternatives, it is anticipated that
7 wolves would be reintroduced in a phased approach over several years (Colorado Wolf Restoration and
8 Management Plan TWG 2022a); as such, wolf numbers and distribution are expected to increase over time.

9 Adverse impacts are those considered to negatively affect wolf populations, while beneficial impacts are those
10 that would positively affect the population compared to existing conditions in the state (i.e., prior to reintroduction
11 by CPW). Some environmental consequences would develop rapidly following wolf reintroduction and be short
12 term, while others may not emerge for several years and would be long term. Long-term impacts account for the
13 biological life span of wolves and the impacts that develop while the wolf population stabilizes. In all alternatives,
14 wolf distribution would initially likely be determined by prey abundance and distribution (O’Neil et al. 2020).
15 Future population growth would be influenced by and fluctuate because of social conflicts with humans, changes
16 in prey density and distribution, and inter- and intraspecific competition.

17 In all alternatives assessed in this EIS, the reintroduction of wolves in Colorado and subsequent ability for the
18 wolf population to grow in numbers and distribution would be highly affected by their interactions with humans.
19 Social tolerance is fundamental for any predator reintroduction, and the relationships between predators and land
20 users is complex (Dickman 2010; Murray et al. 2010; Mech 2017; Pooley et al. 2017; Morehouse et al. 2018).
21 Indeed, the section 10(j) amendment was made to the ESA in 1982 because prior to that, efforts to reintroduce
22 endangered species were often met with public resistance. The region of Colorado where wolves may be naturally
23 reestablishing, and the proposed reintroduction areas, are working landscapes, meaning agricultural and ranching
24 operations are an integral part of the landscape. An analysis by Ditmer et al. (2022) demonstrated that although
25 the northern Western Slope of the state contains high ecological suitable habitat for wolves, the area has low
26 socio-ecological suitability because of high risk of human conflict. Thus, there is high potential for controversy
27 surrounding wolf conservation and management in Colorado if human interests and needs are not being
28 addressed; this would affect the wolf population in both the short and long term. An analysis of the social
29 implications of each alternative, including a discussion of the impacts regarding management flexibility, or lack
30 thereof, following livestock depredations, is included in section 4.7. The following analysis is focused only on the
31 biological aspects of wolf population and distribution under each alternative.

32 **No-Action Alternative**

33 Under the no-action alternative, wolves in the state of Colorado would remain listed as endangered under the
34 ESA. Any take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in
35 any such conduct) of wolves without a permit or authorization is prohibited. See section 2.4.2 for details on the
36 type and nature of interactions associated with this alternative.

37 *Wolf Numbers and Distribution*

38 Under the no-action alternative, wolf numbers and distribution would increase in the short term as wolves are
39 reintroduced to the state. The state and federal governments would have no authority for lethal control, except in
40 cases of human safety. At a local level, ungulates could decline in the short term in response to increased
41 predation rates, which could limit wolf population growth if there was insufficient prey. In the long term, it is
42 likely the ungulate populations would stabilize (due to natural fluctuations; Smith et al. 2003) and be able to
43 support a self-sustaining population of wolves indefinitely. Wolf survival rates and density are expected to be

1 similar to those seen in the northern Rocky Mountains population outside Yellowstone National Park (Smith et al.
2 2010).

3 Some illegal killing (poaching) is expected under the no-action alternative, particularly in the short term after
4 wolves are reintroduced when there is uncertainty about the potential adverse impacts on local land users. Olson
5 et al. (2015) demonstrated that illegal killing of radio-collared wolves in Wisconsin increased in years when
6 wolves were listed as endangered compared to years when they could be managed by the state. In Europe,
7 poaching has reduced or limited the wolf population growth substantially; for example, in Scandinavia, poaching
8 was estimated to have limited the wolf population to one-quarter of what it would have been (Liberg et al. 2012).
9 It is difficult to estimate the amount of illegal mortality that would occur under this alternative. If illegal take is
10 high, the impact on the size and distribution of wolves in Colorado would be detrimental in the short and long
11 term. If illegal take is low, it is expected that in the long term, the wolf population would increase at rates similar
12 to other established populations (i.e., 20 percent per year; Fuller et al. 2003) because wolves are not prey- or
13 habitat-limited in Colorado (Ditmer et al. 2022).

14 *Wolf Habitat and Connectivity*

15 Wolves in Colorado are geographically and demographically connected to wolves in the northern Rockies and
16 Pacific Northwest (Colorado Wolf Restoration and Management Plan TWG 2022a). In the long term, it is likely
17 that individual wolves from adjacent populations would continue to disperse into Colorado and may naturally
18 establish packs with the reintroduced wolves and other dispersers. Any wolves that enter Colorado would be
19 protected as an endangered species under the no-action alternative, regardless of their designation in the
20 jurisdiction from which they originated. This would increase the population of wolves in Colorado and contribute
21 to the long-term conservation and recovery of wolves in western United States.

22 *Conclusions*

23 This alternative is expected to be the most conservative for wolves from a purely biological standpoint because it
24 would limit any take on wolves that are reintroduced or that disperse naturally into the state. Flexibility by state
25 and federal governments to respond to conflicts would be constrained because every wolf would be considered
26 endangered. The population of wolves is expected to increase in growth and distribution in those areas where
27 habitat suitability is high (i.e., where there is sufficient wild prey and limited contact with humans).

28 **Alternative 1**

29 Under alternative 1, gray wolves would be designated across the entire state of Colorado as an experimental
30 population under section 10(j) of the ESA. The management approach aims to achieve wolf reintroduction goals
31 while resolving conflicts when and where they occur. If the population is designated as nonessential, take
32 prohibitions and consultation requirements under the ESA would be relaxed, such that allowable take would
33 include non-injurious, nonlethal conflict minimization practices, potentially injurious hazing techniques,
34 translocation, and lethal take. See section 2.4.3 for details on the type and nature of interactions associated with
35 this alternative.

36 *Wolf Numbers and Distribution*

37 Under alternative 1, the allowable take provisions could reduce the number of wolves in Colorado, particularly in
38 the short term because even a small number of losses would have a larger demographic impact on a small
39 population. Any lethal take of wolves would result in a negative impact during initial reintroduction and would
40 impede (or at a minimum, delay) the ability to establish a self-sustaining population of wolves (Colorado Wolf
41 Restoration and Management Plan TWG 2021) because all wolves would not survive to reproduce and increase
42 the population. Nonlethal take could indirectly affect wolves' ability to reproduce and increase the population if
43 they are unable to establish territories or find mates because they are harassed/deterred away from areas with
44 suitable habitat and prey. Other nonlethal take actions allowed under alternative 1 include capture and relocation,

1 which could be implemented as an alternative to lethal take in circumstances where individual wolves are in
2 conflict with humans on private land (i.e., chronic depredations) or where wolf predation causes significant
3 reductions in regional ungulate populations. It is unlikely that a reintroduced wolf that is disturbed via nonlethal
4 take (e.g., deterrents, capture and translocation) would have reduced survival or inability to breed because wolves
5 are highly adaptable and resilient (Ginsberg and Macdonald 1990), and the management flexibility to implement
6 nonlethal actions may improve wolf survival overall under this alternative (McManus et al. 2015; Bruns et al.
7 2020). However, if wolves are deterred or translocated to an area where they come into conflict with other
8 established wolf packs, or if they disperse outside the state of Colorado, then there would be negative implications
9 to the establishment of a population and could delay downlisting wolves in the state (Colorado Wolf Restoration
10 and Management Plan TWG 2022a).

11 In the long term, it is not expected that allowable take under alternative 1 would have a measurable impact on the
12 population. The sources of conflict that are likely to lead to lethal take are expected to lessen over time (Hill et al.
13 2022) as wolves reestablish at a density that is naturally regulated by wild ungulate prey availability and
14 distribution (Mech and Barber-Meyer 2015) and by territoriality (Cariappa et al. 2011), and nonlethal take
15 (harassment) would become integrated into livestock husbandry best management practices. There would
16 continue to be ongoing management actions (lethal and nonlethal) under alternative 1, but they are not expected to
17 be measurable at a statewide population scale. In the long term, the wolf population is expected to increase at
18 rates similar to other established populations (i.e., 20 percent per year; Fuller et al. 2003) because they are not
19 prey- or habitat-limited in Colorado (Ditmer et al. 2022).

20 *Wolf Habitat and Connectivity*

21 Similar to the no-action alternative, the actions in alternative 1 would not affect wolf habitat and connectivity
22 because there would continue to be natural emigration and immigration from neighboring packs in the northern
23 Rockies and Pacific Northwest. It is likely that individual wolves from adjacent populations would continue to
24 disperse into Colorado, where they would be managed under the regulations of section 10(j).

25 *Conclusions*

26 Alternative 1 could result in adverse impacts to individual wolves through regulated take and could delay
27 recovery in the short term, but is not expected to hinder recovery or have adverse population-level effects in the
28 long term. Alternative 1 promotes an adaptive management approach for wildlife managers to support both wolf
29 conservation goals and ungulate populations, and to implement deterrent tools (nonlethal take) that reduce the
30 potential for livestock depredation.

31 **Alternative 2**

32 Under alternative 2, regulations and wolf management approaches would be implemented in two different ways.
33 In most of Colorado, reintroduced wolves would potentially be managed as an experimental population under a
34 section 10(j) rule. Should an existing population of wolves be determined to exist in a specific area of the state,
35 those wolves would be managed in a limited territory as an endangered species under a section 10(a)(1)(A) permit
36 (see figure 2-2). Resolution of conflicts would depend on where the wolves are located in the state. See section
37 2.4.5 for details on the type and nature of interactions associated with this alternative.

38 *Wolf Numbers and Distribution*

39 In the part of the state where 10(j) is approved, short- and long-term impacts would be the same as described for
40 alternative 1. In the 10(a)(1)(A) permit area, wolf density may be higher in the short term because only nonlethal
41 take would be permitted on both private and public land. The 10(a)(1)(A) permit area may act as a source habitat
42 where growth rate and density increases, compared to the rest of the state where risk of human-caused mortality is
43 higher (O'Neil et al. 2020). This may improve the ability to reach the thresholds for minimum counts in
44 successive years to support changing the state wolf protections in the entire state. However, there is uncertainty in

1 quantifying rates of population growth in the 10(a)(1)(A) permit area and in the 10(j) area because it is currently
2 not known how many wolves would be reintroduced in the state, how much legal take would occur in the 10(j)
3 area, and how much illegal take would occur in the 10(a)(1)(A) permit area.

4 The more rapid population growth that is initially expected with the added protection in the 10(a)(1)(A) permit
5 area would cease as wolves approach carrying capacity of the 10(a)(1)(A) permit area (Smith et al. 2003). In the
6 long term, wolves would naturally disperse from the 10(a)(1)(A) permit area and colonize suitable habitat in the
7 10(j) area with sufficient prey and minimal social conflicts. Prey densities are high enough in Colorado to support
8 viable wolf populations (Ditmer et al. 2022). It is expected that in the long term, the wolf population would
9 increase at rates similar to the management approach of alternative 1.

10 *Wolf Habitat and Connectivity*

11 Similar to alternative 1, wolf habitat and connectivity would not be affected because there would continue to be
12 natural emigration and immigration from neighboring packs in the Northern Rockies and Pacific Northwest under
13 alternative 2. Of note though, is the geographic area represented by the 10(a)(1)(A) permit area (figure 2-2) has
14 recently been recommended by a group of scientists to be included in a proposed large reserve network of
15 publicly owned federal lands to promote connectivity for gray wolves in western United States (Ripple et al.
16 2022). This could result in increased connectivity between adjacent wolf range under alternative 2 with the added
17 protection of the 10(a)(1)(A) permit area.

18 *Conclusions*

19 This alternative is expected to benefit wolves in the short term and have the same effects as alternative 1 in the
20 long term. Under this alternative, wolves that establish a population naturally in the 10(a)(1)(A) permit area
21 would be granted more protection than wolves that are reintroduced to the rest of the state. The wolf population
22 may increase more rapidly in the state as a whole because of the protection granted in one small area, which
23 would support wolf conservation and recovery objectives. However, wildlife do not respect invisible boundaries
24 of administrative zones, and wolves that occur naturally in the 10(a)(1)(A) permit area would eventually disperse
25 into the 10(j) area based on biological needs and their social environment and be subject to the same human-
26 caused mortality risks as those reintroduced wolves.

27 **4.4.2 Other Species of Special Concern**

28 The following analysis considers the environmental consequences of the management options under consideration
29 for the reintroduction of wolves in Colorado on species of special concern, including other federally listed
30 species, Colorado State-listed species, and other SGCN. Environmental consequences were evaluated at the
31 statewide population level for State-listed species and other SGCN and at the nationwide population level for
32 federally listed species. Adverse impacts are considered to be those that would negatively affect species
33 populations, or in the case of federally listed species with approved recovery plans, substantially delay or prevent
34 species recovery criteria from being met. Beneficial impacts are those that would positively affect species
35 populations compared to existing conditions, or in the case of federally listed species with approved recovery
36 plans, enhance recovery. Short-term effects are those that would occur within the first few years of wolf
37 reintroduction, while long-term effects are those that would take longer to develop as wolf populations increase
38 and as their range expands throughout the state.

39 The reintroduction of wolves in Colorado could affect species of special concern. Wolves could compete with
40 other listed predators, such as Canada lynx, or prey on listed ground-nesting birds, such as Gunnison sage-grouse.
41 Gray wolves could also breed with Mexican wolves, a subspecies that has been reintroduced in New Mexico and
42 Arizona, potentially resulting in genetic swamping, if the ranges of both species expand and eventually overlap.
43 Although reintroduced wolves could affect species of special concern through various direct and indirect

1 interactions, these potential consequences are related to the State of Colorado’s action and are therefore beyond
2 the scope of this EIS.

3 **No-Action Alternative**

4 Under the no-action alternative, the State would not have the flexibility to manage reintroduced wolves for the
5 purposes of protecting or managing species of special concern, including other federally or State-listed species. If
6 populations of species of special concern decline as a result of predation or other pressures associated with the
7 presence of wolves, the State would not have the flexibility to manage wolves using nonlethal or lethal methods to
8 promote conservation or recovery of protected species because reintroduced wolves in Colorado would not be
9 designated as an experimental population under ESA section 10(j) and would be protected as a federally
10 endangered species throughout the state. The lack of flexibility for the management of wolves could result in
11 short- or long-term, adverse effects on prey species, such as the federally threatened Gunnison sage-grouse and
12 other ground-nesting birds if their populations decline as a result of wolf reintroduction. The no-action alternative
13 could also have long-term, adverse effects on the Mexican wolf if the ranges of both species expand and
14 interbreeding occurs. However, the no-action alternative is not likely to adversely affect species of special
15 concern because substantial population declines or jeopardy of the continued existence of species of special
16 concern have not been documented as a result of previous wolf reintroductions elsewhere in North America.

17 **Alternatives 1 and 2**

18 The environmental consequences of the alternatives 1 and 2 on species of special concern would be the same as
19 under the no-action alternative because management flexibility for reintroduced wolves under alternatives 1 and 2
20 would not include provisions for the take of wolves for the purposes of protecting or managing species of special
21 concern.

22 **4.5 OTHER WILDLIFE SPECIES**

23 Environmental consequences on other wildlife species were evaluated at the statewide population level. Adverse
24 impacts are considered to be those that would negatively affect species populations, while beneficial impacts are
25 those that would positively affect species populations compared to existing conditions and relative to established
26 State management goals where applicable. Short-term effects are those that would occur within the first few years
27 of wolf reintroduction, while long-term effects are those that would take longer to develop as wolf populations
28 increase and as their range expands throughout the state. Although some species, primarily prey species, could
29 experience local population-level effects shortly after wolf reintroduction, most environmental consequences
30 would take years to develop before they could affect wildlife populations on a statewide scale. Therefore, the
31 following analysis focuses mostly on the potential long-term environmental consequences of the alternatives.

32 The reintroduction of wolves in Colorado could affect other wildlife species through predation and competition.
33 Wolves can influence other wildlife populations either directly (e.g., predation) or indirectly (e.g., behavioral
34 modification of prey species and mesocarnivores [predators that occupy mid-levels of food webs] Estes et al.
35 2011; Ripple and Beschta 2012; Ripple et al. 2014). The reintroduction of wolves could cause prey species to
36 change their feeding habits by avoiding areas where they could readily be ambushed (Dobson 2014) or change
37 their movement patterns and habitat preferences (Smith et al. 2003), as was observed in elk after the
38 reintroduction of gray wolves at Yellowstone National Park. Similarly, in some areas where wolves have been
39 restored, competing carnivores have changed their predation habits or habitat selection to avoid competition with
40 wolves (Smith et al. 2003). These potential consequences are related to the State of Colorado’s action and would
41 not be affected by any alternative selected by the Service for flexibility (or lack thereof) in the management of
42 wolves in Colorado with regard to take as defined under the ESA. Therefore, they are beyond the scope of this
43 EIS and are not included in the following analysis.

1 The following analysis is limited to potential environmental consequences of the alternatives on Colorado’s
2 ungulate populations. Alternatives 1 and 2 include provisions for the take of wolves in limited circumstances,
3 including in the event that wolf predation is having an unacceptable impact on wild ungulate populations.
4 However, the alternatives do not provide management flexibility for wolves for the purposes of protecting or
5 managing other wildlife populations. Therefore, potential impacts of wolf reintroduction on non-ungulate
6 populations would occur independently of the proposed action and would not be affected by the alternative
7 selected.

8 **4.5.1 No-Action Alternative**

9 Under the no-action alternative, wolf reintroduction without the management flexibility that would be provided to
10 the State under ESA section 10(j) could affect wildlife species, especially wolf prey species, because the State
11 would not have the ability to manage wolves for the purposes of managing other wildlife populations for
12 conservation.

13 *Elk and Deer*

14 Under the no-action alternative, Colorado’s statewide elk and deer populations could decline in response to
15 unmanaged predation and other pressures as a result of wolf reintroduction. However, wolf presence may or may
16 not directly influence changes in ungulate population dynamics. Prey populations naturally vary through time in
17 response to environmental factors (e.g., severe winters, natural mortality), predation pressure by carnivores (in
18 Colorado, wolves would compete primarily with black bears and mountain lions), hunter harvest pressure, and
19 habitat conditions (Smith et al. 2003). If elk and deer populations declined below the State’s management goals
20 the State would not have the flexibility to manage wolves to meet elk and deer management goals, even if wolves
21 were a major driver of population decline, because reintroduced wolves in Colorado would not be designated as
22 an experimental population under ESA section 10(j) and would be protected as a federally endangered species
23 throughout the state. The no-action alternative could adversely affect elk and deer over the long term because the
24 State would not have the flexibility to manage wolves to limit elk and deer population decline or facilitate
25 recovery. However, it is possible that no adverse effects would occur because although elk and deer populations
26 may decline in the short term at the local level in response to wolf predation, it is likely they would stabilize over
27 the long term (due to natural fluctuations in their populations; Smith et al. 2003).

28 *Other Ungulates*

29 In the absence of management flexibility for reintroduced wolves in Colorado, pronghorn, wild sheep, bison, and
30 moose populations could decline. Like with elk and deer, if populations of these species decline below State
31 management goals in response to wolf reintroduction, the State would not have the flexibility to manage wolves
32 to promote species conservation or recovery. Therefore, the no-action alternative could adversely affect other
33 ungulate species over the long term. As is the case with elk and deer, if the populations of other ungulate species
34 do not decline below State management goals in response wolves, these adverse effects would not occur.

35 **4.5.2 Alternative 1**

36 Under alternative 1, the State of Colorado would have the flexibility to manage reintroduced wolves using
37 nonlethal and/or lethal methods for the purposes of managing other wildlife species consistent with established
38 State management goals, in accordance with section 10(j) of the ESA. Take of wolves would be permitted only if
39 the State has determined that wolf interactions are a major driver of population declines in other wildlife species
40 and are preventing species populations from meeting established State management goals. Management flexibility
41 for reintroduced wolves would have the greatest potential to affect prey species, primarily ungulates, whose
42 populations could be affected by the reintroduction of wolves—either directly, through predation, or indirectly
43 through behavioral changes.

1 **Elk and Deer**

2 Elk and deer are likely to be the primary prey for wolves in Colorado based on their population densities in the
3 study area and documented prey selection by wolves elsewhere in the northern Rocky Mountains. Although elk
4 and deer have the highest population densities in Colorado compared to other wolf prey species, their populations
5 could decline over time as a result of predation, behavioral changes, or changes in habitat use in response to wolf
6 reintroduction (Smith et al. 2003; Estes et al. 2011; Ripple and Beschta 2012). If population levels decline below
7 established State management goals as a result of wolf reintroduction, management flexibility, including nonlethal
8 and/or lethal take, that would be provided under alternative 1 would allow the State to take a limited number of
9 wolves as a means to achieve its established goals for the statewide management of elk and deer populations.
10 Alternative 1 could have a beneficial impact on elk and deer over the long term because their populations would
11 continue to be managed in accordance with established State management goals, despite additional pressures on
12 their populations that would result from the reintroduction of wolves.

13 **Other Ungulates**

14 Other ungulates such as pronghorn, wild sheep, bison, and moose could also be selected prey species for wolves
15 in the study area or elsewhere in the state. Like with elk and deer, alternative 1 would allow the State the
16 flexibility to manage wolves through regulated take if wolves cause the populations of other ungulates to decline
17 below established State management goals, potentially resulting in a long-term, beneficial impact on these
18 species.

19 **4.5.3 Alternative 2**

20 Under alternative 2, if an existing population of gray wolves is discovered in Colorado, the State would have the
21 flexibility to manage the existing population under a section 10(a)(1)(A) permit. The provisions of the permit
22 would be the same as those described for the section 10(j) rule under alternative 1, except that only nonlethal take
23 would be permitted. Wolves introduced outside the range of the existing gray wolf population would be managed
24 in accordance with section 10(j), like under alternative 1.

25 The level of flexibility that the State would have for the management of reintroduced wolves, including the use of
26 nonlethal and/or lethal take, would be the same as under alternative 1. Management of an existing wolf population
27 under a section 10(a)(1)(A) permit would not affect the options available to the State for the management of the
28 experimental population of reintroduced wolves. Any impacts on other wildlife populations that could result from
29 predation or competition with existing wolves would occur independently of the management of reintroduced
30 wolves. Therefore, the environmental consequences of alternative 2 on other wildlife species would be the same
31 as described under alternative 1. Alternative 2 could have long-term, beneficial impacts on elk and deer, other
32 ungulates, and other wildlife species because the State would have the flexibility to manage reintroduced wolves
33 for the purposes of managing other wildlife populations to achieve established State management goals.

34 **4.6 TRIBAL CULTURAL RESOURCES**

35 The following section discusses the potential impacts to Tribal cultural resources, which for the purposes of this
36 evaluation, include archaeological and historical sites and natural resources of importance to the Ute and Pawnee
37 Nation, as well as Tribal treaty rights and reservations.

38 [Preparer’s note – additional information will be added to this discussion as received from Tribal consultation; the
39 current discussion largely focuses on the Southern Ute Indian Tribe and Ute Mountain Ute Tribe; however, the
40 Pawnee Nation is noted above due to their request for government-to-government consultation.].

1 **4.6.1 No-Action Alternative**

2 **Archaeological and Historical Resources**

3 Under the no-action alternative, the State and Tribes would have limited management options available to control
4 the presence of wolves that may cause damage to archaeological and historical resources or inhibit Tribal access
5 to these resources.

6 Wolf activities could damage Ute, Pawnee, and other Tribal archaeological and historical resources located within
7 the focal counties, as well as those outside these counties. Archaeological or historical resources that may be
8 affected include rock shelters (labeled in the OAHP database as Sheltered Lithic, Sheltered Camp, and Sheltered
9 Architectural; see table 3.6 in section 3.5), because wolves could use the locations in which these sites are present
10 as dens, thus affecting the ability of Ute cultural practitioners to visit and tend to these sites. Wolves may also
11 move into Ute traditional hunting grounds (see section 3.4.3, *Tribal Treaty Rights and Reservations*). These
12 resources (i.e., traditional hunting grounds) are not quantified as formal site types within the OAHP database but
13 are sometimes marked by Cambium Trees, which are recorded in the database.

14 As labeled in the OAHP database, 74 rock shelters (Sheltered Lithic, Sheltered Camp, and Sheltered Architectural
15 sites) and 174 Cambium Tree (Cambium Tree and Carving Rock or Wood Cambium Tree sites) locations were
16 previously recorded in the focal counties. Due to these numbers and the large geographic expanse of the area
17 considered, the likelihood of a wolf creating a den in one of the locations of a rock shelter or causing physical
18 damage to one of the Cambium Tree sites is anticipated to be low. Potential impacts to traditional hunting grounds
19 are discussed below.

20 **Natural Resources of Cultural Importance**

21 The State and Tribes would have limited management flexibility under the no-action alternative to affect how
22 wolves would interact with other natural resources of cultural importance to Tribes. This alternative would not
23 allow for lethal or nonlethal take.

24 Natural resources of importance to Tribes that could be impacted by the reintroduction of wolves into the state of
25 Colorado include other wildlife, in part due to competition resulting in changes to predation habits or habitat
26 selection. For example, as noted in section 3.4, the bear is honored by the Ute Mountain Ute and Southern Ute in
27 the bear dance (Southern Ute Tribe 2022). As discussed in section 3.2.1, *Gray Wolf*, wolves may directly compete
28 with other predators for prey or habitat, including the black bear. Bears may kill or be killed by wolves. In some
29 areas where wolves have been restored, competitors have changed their predation habits or habitat selection to
30 avoid competition with wolves. Section 3.2.1, *Gray Wolf*, indicates that black bears occur throughout most of the
31 western two-thirds of Colorado, and wolves have been documented to kill black bears on occasion. In the majority
32 of these cases, wolves have outnumbered black bears, giving them a competitive advantage in combat.

33 **Tribal Treaty Rights and Reservations**

34 The introduction of wolves may affect Tribal treaty rights, including those within the Brunot Area lands, for off-
35 reservation hunting. The introduction of wolves may impact the population of elk, deer, other ungulates, bison,
36 and moose due to their presence within locations used for hunting (see also section 4.5, *Other Wildlife Species*,
37 and section 4.7, *Socioeconomic Resources*). However, under this alternative, the State and Tribes would have
38 limited management flexibility in addressing these potential concerns.

39 Both the Ute Mountain Ute and the Southern Ute have Tribal treaty rights for hunting in the Brunot Area and
40 agreements with the State of Colorado. Tribal rights are also maintained in the San Juan National Forest. As noted
41 in the *San Juan National Forest and Resource Management Plan* (U.S. Forest Service 2021), “[in] exercising
42 their Brunot hunting rights, the Ute Mountain Ute and Southern Ute Tribal members are required to adhere to
43 federal policy and regulations designed to protect natural and cultural resources.”

1 Through predation and competition, the reintroduction of wolves could affect wildlife species that are hunted or
2 used by the Tribes, such as elk, deer, and other ungulates. As discussed in section 4.5, wolves can influence other
3 wildlife populations either directly (e.g., predation) or indirectly (e.g., behavioral modification of prey species and
4 mesocarnivores). The reintroduction of wolves could cause prey species to change their feeding habits by
5 avoiding areas where they could readily be ambushed or change their movement patterns and habitat preferences.

6 As a result, under the no-action alternative, elk and deer populations could decline in response to unmanaged
7 predation and other pressures as a result of wolf reintroduction. Section 4.5 indicates that the use of the no-action
8 alternative could affect elk and deer over the long term because the State and Tribes would not have the flexibility
9 to manage wolves to limit elk and deer population decline or facilitate recovery. In addition, the same could occur
10 for pronghorn, wild sheep, bison, and moose.

11 However, as discussed in section 4.7, hunting-related benefits are not anticipated to decline across the state,
12 impacts may be experienced at a local level, where wolves may contribute to declines in big game herds.

13 Under this alternative, take would be allowed only as self-defense. Therefore, the State would not have the ability
14 to take wolves that reduce big game ungulate populations below established State goals. Consultation with the
15 Service also would be required under section 7 of the ESA.

16 Potential impacts associated with wolf depredation on domestic livestock are also discussed in section 4.7.
17 Estimates show that roughly an average of 19 cattle and 68 sheep would be lost per year. These numbers account
18 for the entire state, rather than an individual location, such as one of the reservations.

19 **4.6.2 Alternative 1**

20 **Archaeological and Historical Resources**

21 Impacts to archaeological and historical resources under alternative 1 are anticipated to be similar to those
22 described for the no-action alternative. However, impacts to these resources, such as damage from dens and
23 inhibiting access to sites, may be reduced through the management flexibility offered by the 10(j) rule.
24 Alternative 1 would allow take to occur in certain instances of conflict between wolves and people. As noted
25 above for the no-action alternative, the likelihood for conflict with wolves would be anticipated to be low due to
26 the numbers of recorded sites present and probability that wolves may use these sites.

27 **Natural Resources of Cultural Importance**

28 Impacts to natural resources of cultural importance are anticipated to be similar to those described for the no-
29 action alternative, although additional management options for the reintroduction of gray wolves would be
30 available to both the State and Tribes under alternative 1. The Service further recognizes that “many Indians use
31 federally protected birds, bird feathers and remains, and other animal and plant material for their Tribal cultural
32 and religious expression. [The Service] will work in collaboration with Tribal governments to protect traditional,
33 customary, ceremonial, medicinal, spiritual, and religious uses of plants and animals for Tribal members where it
34 is not contrary to [the Service’s] legal mandates and conservation goals” (USFWS 2016).

35 **Tribal Treaty Rights and Reservations**

36 Under alternative 1, if population levels of elk and deer decline below established State and/or Tribal management
37 goals as a result of wolf reintroduction, management flexibility, including nonlethal and/or lethal take, afforded to
38 the State and Tribes with approved management plans would allow these entities to take a limited number of
39 wolves as a means to achieve its established goals for the statewide management of elk and deer populations. As
40 described in section 4.5, alternative 1 could have a beneficial impact on elk and deer over the long term because
41 their populations would continue to be managed in accordance with established State management goals, despite
42 additional pressures on their populations that would result from the reintroduction of wolves.

1 Similar to elk and deer, alternative 1 would allow the State and potentially Tribes the flexibility to manage wolves
2 through regulated take if wolves cause the populations of other ungulates to decline below established State
3 management goals, potentially resulting in a long-term, beneficial impact on these species (see section 4.5 for
4 additional information). The Service would work with Tribes to serve as designated agents of the Service on
5 reservation lands or those under the Tribe’s jurisdiction. The Service outlines some of these responsibilities in its
6 Native American Policy, Part 510: Working with Native American Tribes (USFWS 2016). According to this
7 policy, “There is a broad range of collaborative management opportunities available to the Service and Tribes.
8 These opportunities include holding informative discussions to seek Tribal input, entering into formal agreements
9 with Tribes, cooperatively setting harvest quantities, and sharing conservation management of resources”
10 (USFWS 2016). Responsibilities as a designated agent often are established via a memorandum of agreement or
11 other cooperative agreement. This type of agreement would implement the provisions of the rule within the Tribal
12 jurisdiction (i.e., take of wolves that may cause concerns within the boundary of the reservation). The Tribe would
13 be required to have a management plan in place to be a designated agent. The management plan would require
14 peer review.

15 For instance, as part of the gray wolves management for the northern Rocky Mountains, the Service’s final 10(j)
16 rule provided for recognition of the unique relationship between federal and Tribal governments. In this manner,
17 the rule provided Tribes with the same opportunities on reservation lands that the Service offered to states for
18 their land under their management authority. As a result, Tribes with Service-approved wolf management plans
19 could assume the lead on their reservation lands (DOI 2005). “This rule also treats Tribal members’ lands on
20 reservations as private property within the borders of States with approved wolf plans, increasing wolf
21 management flexibility to protect the private property of Tribal members. In addition, Tribal members who are
22 legally grazing their livestock on public lands may protect them from wolf attack” (DOI 2005).

23 Due to the potential use of lethal and nonlethal take, the impacts associated with wolf reintroduction to hunting
24 may be lower under alternative 1 when compared to the no-action alternative (see section 4.7 for additional
25 information). This alternative provides more flexibility in managing the wolf reintroduction compared to the no-
26 action alternative (see above discussion regarding elk, deer, and other ungulates).

27 The Service also would work with the State and Tribes to develop wolf management plans that would be within
28 the provisions of the experimental population regulations to account for the wolf releases. The Tribes would have
29 the option to enter into management agreements with the Service that could serve to reduce potential impacts if
30 wolves were allowed to occupy reservation lands and areas used to exercise Tribal treaty rights, such as hunting.

31 **4.6.3 Alternative 2**

32 Under alternative 2, the Service has allowed for the potential for an existing population of gray wolves to be
33 present. The section 10(a)(1)(A) permit boundary would be located in the northern portion of the state within
34 Jackson and Larimer Counties.

35 Potential impacts to Tribal resources under alternative 2 would be similar to those described for the no-action
36 alternative and alternative 1; however, the geographic location in which impacts may occur may vary due to the
37 smaller boundaries of the experimental population (i.e., excluding the section 10(a)(1)(A) permit boundary)
38 compared to the entire state noted for alternative 1. Likewise, the requirements for lethal and nonlethal take would
39 vary depending on the location of the wolves, i.e., within the permit boundary or in the experimental population
40 boundary.

41 **Archaeological and Historical Resources**

42 Impacts to archaeological and historical resources under alternative 2 are anticipated to be similar to those
43 described for alternative 1.

1 **Natural Resources of Cultural Importance**

2 Impacts to natural resources of cultural importance are anticipated to be similar to those described for the
3 alternative 1.

4 **Tribal Treaty Rights and Reservations**

5 Under alternative 2, impacts to Tribal treaty rights and in the 10(j) area would be similar to those as presented for
6 alternative 1. However, alternative 2 would allow for lethal and/or nonlethal take in most areas of the state except
7 in areas of Jackson County and western Larimer County where section 10(a)1(A) would apply.

8 **4.7 SOCIOECONOMIC RESOURCES**

9 **4.7.1 Methodology**

10 The purpose of this analysis is to examine the socioeconomic impacts of the Service implementing a regulatory
11 framework to provide management flexibility for the State of Colorado’s reintroduction of the gray wolf. The
12 socioeconomic implications for outdoor recreation, agriculture, and livestock production are presented in a
13 contextual analysis. Additionally, this analysis attempted to review qualitative sources to identify costs associated
14 with lethal and nonlethal take, though literature on this topic is limited. Impacts to tourism were considered;
15 however, the implementation of a regulatory framework under the ESA to manage reintroduced wolves is not
16 expected to change tourism, either in a beneficial or adverse manner. Therefore, tourism was excluded from
17 detailed analysis.

18 **4.7.2 No-Action Alternative**

19 **Impact on Outdoor Recreation**

20 Outdoor recreation contributes over \$800 million and 7,937 jobs to the Colorado economy (see Chapter 3). The
21 no-action alternative could affect outdoor recreation, particularly hunting outfitters and guides. Under the no-
22 action alternative, there would be no take provisions, lethal or nonlethal, to address wolves if they reduce the
23 population of big game ungulates below State or Tribal management goals. A 1982 study in Washington state
24 found that when elk populations decrease, hunter-days are also reduced. For example, in the case of a hypothetical
25 uniform decrease in the elk population across the state of 10 percent, the resulting loss would be 49,900 days
26 because of discouraged hunters and 27,982 days from reduced hunting annually. Therefore, decreases in elk
27 populations could impact hunting by reducing the number of licenses issued and discouraging hunters in general
28 (Miller 1982). A 2012 economic analysis developed a way to measure wolf impacts on elk harvest and used that
29 as a proxy to access the impacts wolves have on the hunting industry (Hazen 2012). The study determined that
30 wolves did not have a major impact on elk harvest in Montana; however, wolves shifted the demand for big game
31 hunting to other parts of the state where wolves were not introduced. If ungulate herds fell below State or Tribal
32 population goals or the presence of wolves altered the movement patterns of big game species and/or shifted
33 demand for hunting to different parts of the state, then outfitters and guides could experience long-term localized
34 consequences from the lack of flexibility for take presented in the no-action alternative. Additionally, a shift in
35 hunting demand could decrease hunting revenues. The same 2012 study found that the number of hunting
36 applications decreased in parts of the state where wolves were present. In southwest Montana, the presence of
37 wolves decreased hunter applications by almost 20 percent of the standard deviation (i.e., the background amount
38 of variation in application numbers across the state). This decrease comprised 286 fewer applications. In the west-
39 central part of the state, applications decreased by nearly 3 percent of the standard deviation (six fewer
40 applications) (Hazen 2012). CPW uses hunting license fees to help fund agency operations. A decline in hunting
41 applications could lead to decreased wildlife revenue for CPW, which may result in a decrease in funds available
42 for wolf management operations. However, even if management flexibility was in place, it would only address a
43 decrease in the size of ungulate herds, not how herds move around the state; therefore, impacts from a lack of a

1 regulatory framework would be the result of any reduction in ungulate herds with corresponding impacts to
2 businesses that focus on outdoor recreation.

3 Under the no-action alternative, the State or Tribes would not be allowed to take wolves (lethal or nonlethal) if
4 wolf predation or activities impact the abundance or distribution of ungulates such that State or Tribal
5 management goals are not being met. The change in the abundance of big game could limit the ability of outfitters
6 and guides to have access to ungulates and result in a loss of business, resulting in long-term, localized, adverse
7 impacts to these businesses.

8 **Impact on Agriculture and Livestock Production**

9 Under the no-action alternative, livestock producers would have the fewest take options to manage wolf predation
10 on their livestock, with take only permitted in the case of human safety. In the short term, wolf depredation on
11 domestic livestock is likely be minimal. After wolf recovery levels are approached, depredation loses are
12 anticipated to increase. The economic loss from livestock depredation on ranchers is calculated by multiplying the
13 estimated number of lost animals per year by the market value. However, counting the number of livestock
14 expected to be killed after reintroduction is challenging because the exact number is unknown. For example, in
15 2014, the National Agricultural Statistics Service (NASS) reported that wolves in Montana, Idaho, and Wyoming
16 killed 2,835 cattle and 453 sheep.¹ In contrast, the Service reported that wolves killed 114 cattle and 136 sheep
17 (USFWS et al. 2016).² However, studies show that overall livestock deaths caused by wolves were less than
18 anticipated. In the northern Rocky Mountain region, less than 1 percent of annual gross income was lost to wolf
19 predation on cattle and sheep between 1987 and 2003 (Center for Human-Carnivore Coexistence 2020b; Muhly
20 and Musiani 2009). During this period, gray wolves were managed as federally listed endangered species in the
21 region (Muhly and Musiani 2009). In its review of wolf depredation of domestic livestock in North America, the
22 *1994 Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho Final EIS* determined that
23 the rate of wolf depredation on domestic livestock across large geographic areas is relatively low, averaging less
24 than 0.01 percent of livestock within wolf range (USFWS 1994). In the short term, under the no-action
25 alternative, wolf depredation on domestic livestock is likely to be minimal. After wolf recovery levels are
26 approached, depredation loses are anticipated to increase. When wolves were reintroduced to Yellowstone
27 National Park it was estimated that 100 wolves, the recovered wolf population, would kill on average 19 cattle
28 and 68 sheep annually. However, once wolf recovery levels are achieved, depredation losses could range from 1
29 to 32 cattle per year and 17 to 110 sheep per year.³ Thus, for the purposes of analysis, it was assumed that
30 livestock producers in Colorado would lose 1 to 32 cattle and 17 to 110 sheep⁴ a year due to livestock
31 depredation. This estimated depredation would result in between \$7,078 and \$82,013 in livestock depredation
32 losses annually under the no-action alternative. Though this may be a small loss for the livestock industry across
33 the state, the economic loss could have a greater impact on ranchers and livestock producers in areas where

¹ In addition, the NASS numbers are based on a self-reported survey of livestock producers and do not include verification of kills. This leaves the accuracy of these data in question, and the reports likely overestimate the number of livestock killed by wolves (Center for Human-Carnivore Coexistence 2020b).

² The Service data are underestimates because they do not include livestock that are killed by wolves but are never found or reported.

³ Estimates are from the *1994 Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho Final EIS*. In the analysis, an equation was developed to standardize depredation rates. The application of the equation uses comparable data from Alberta, Canada, northwestern Montana, and Minnesota to the Yellowstone analysis area (USFWS 1994).

⁴ The low and high cattle and sheep loss estimates were obtained from the *1994 Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho Final EIS* under the assumption that the numbers would be comparable to Colorado (USFWS 1994). In addition, Colorado has not published population goals for gray wolves. Therefore, the numbers utilized in this analysis are derived from other reintroduction efforts.

1 wolves are established (Center for Human-Carnivore Coexistence 2020b, Muhly and Musiani 2009). Table 4-1
 2 shows the estimated economic value of the projected losses associated with wolf depredation in Colorado. Under
 3 the no-action alternative the estimated percent of livestock depredation would be between 0.0002 percent to
 4 0.0020 percent of the total value of cow and sheep sales in Colorado.

5 **Table 4-1. Estimated Annual Economic Costs Associated with Livestock Depredation in Colorado**

	Low Estimate	High Estimate	Average Estimate
Cattle lost	1	32	19
Average value per cow ^{5,6}	\$1,419	\$1,419	\$1,419
Sheep lost	17	110	68
Average value per sheep ^{7,8}	\$333	\$333	\$333
Total lost value/year	\$7,078	\$82,013	\$49,590
Total value of cattle and sheep ⁹	\$4,127,427,000	\$4,127,427,000	\$4,127,427,000
Percent of value loss	0.0002%	0.0020%	0.0012%

6 Source: USDA-NASS 2017

7 Under the no-action alternative, livestock producers would not have the ability to exercise management that
 8 would result in take to mitigate wolf predation on their livestock. Wolves can excessively kill smaller livestock
 9 such as sheep and goats (surplus killing) because they are more defenseless, and they can stress animals, causing
 10 weight loss, sickness, and a decline in pregnancy rates of livestock, therefore decreasing the value of the livestock
 11 (Center for Human-Carnivore Coexistence 2020b). There are not many studies that estimate the indirect impacts
 12 that wolves have on calf weight. However, one study found a statistically significant effect on cattle calf weights
 13 on ranches with confirmed wolf predation. Furthermore, calves pastured on a ranch with confirmed depredation
 14 were 3.5 percent lighter than those without depredation. The resulting weight loss equaled an average of \$6,679
 15 loss in revenue for the ranchers in the study's sample population.¹⁰ When extrapolated to western Montana, the
 16 study found that weight loss of cattle due to wolf depredation would result in a loss of \$247,130 (Ramler et al.
 17 2014). Another study analyzed how wolves affect ranch profitability using a 400 head cow-calf ranch in
 18 Wyoming and found that short-run financial impacts of indirect effects are potentially as large or even more
 19 prominent than those of direct wolf predation. Decreased conception rates and a decline in weaning weights had a
 20 negative effect on the year-to-year profitability of the ranching, reducing the profits of the ranch by \$10,250 to
 21 \$12, 855, which was larger than the direct predation loss of \$10,778 (Steele et al. 2013).

22 **Conclusion**

23 Outdoor recreation and agriculture and livestock production would experience the most socioeconomic impacts
 24 under the no-action alternative due to the inability to use lethal or nonlethal take to address the potential impacts
 25 of wolves on business, including livestock operations. Under the no-action alternative, there would be no take
 26 provisions, lethal or nonlethal, to address wolves if they reduce the population of ungulates below State

⁵ Average value per cow value calculated using data from the USDA 2017 Census of Agriculture.

⁶ Average value per cow = Cow/Calf Sales divided by Inventory (\$3,989,383,000 ÷ 2,812,306 = \$1,418.55)

⁷ Average value per sheep value calculated using data from USDA 2017 Census of Agriculture.

⁸ Average value per sheep = Sheep Sales divided by Inventory (\$138,044,000 ÷ 414,672 = \$332.90)

⁹ Total value of cattle and sheep = Cow/Calf Sales + Sheep Sales

¹⁰ Based on a sample of 18 ranches in western Montana.

1 management goals. Outfitters and guides could experience long-term localized consequences from the lack of
2 flexibility for take. A decline in hunting applications could lead to decreased wildlife revenue for CPW.

3 Under the no-action alternative, livestock producers would have the fewest take actions available to manage wolf
4 predation on their livestock, with the only take permitted being in the case of human safety. Between \$7,078 and
5 \$82,013 in livestock depredation losses could occur under the no-action alternative, which represents between
6 0.0002 percent to 0.0020 percent of the total value of cattle and sheep.

7 **4.7.3 Alternative 1**

8 Under alternative 1, the Service would classify gray wolves reintroduced in Colorado as an experimental
9 population under section 10(j) of the ESA. If the population were deemed nonessential, the section 10(j) rule
10 would specify the allowable take of gray wolves and would include lethal and nonlethal management measures.

11 **Impact on Outdoor Recreation**

12 Alternative 1 would have long-term, beneficial impacts on outdoor recreation outfitters and businesses in
13 Colorado compared to the no-action alternative. Under alternative 1, the State and Tribes would have the greatest
14 management flexibility in managing the reintroduction of wolves. The Service and its authorized agents,
15 including the State and Tribes, could use nonlethal and/or lethal management actions that would result in take to
16 mitigate the risk of ungulate populations decreasing below State or Tribal population goals. However, as noted
17 under the no-action alternative, hunting permit applications may decrease in areas where wolves are present. Also,
18 the presence of wolves could cause big game herds to move to locations inaccessible to outfitters and guides. The
19 implementation of a 10(j) rule to allow for management flexibility would not address the movement of wildlife,
20 only a reduction in wildlife numbers. As a result, there would be long-term benefits from the ability to address a
21 reduction in ungulate populations, but adverse impacts on these businesses may still occur from the potential
22 movement of ungulate populations. Adverse impacts could also result in a decrease in demand for permits in areas
23 of the state where wolves are present, similar to what was measured in the 2012 study. This would apply to all
24 alternatives.

25 Alternative 1 would not affect businesses associated with recreational hunting to the degree that the no-action
26 alternative would because the State or Tribes would have the flexibility to manage the reintroduction of wolves
27 using lethal and nonlethal forms of take.

28 **Impact on Agriculture and Livestock Production**

29 Alternative 1, would allow livestock producers to use lethal and nonlethal take to reduce the socioeconomic
30 impacts of wolf reintroduction caused by depredation of livestock. Compared to the no-action alternative,
31 alternative 1 would lower the direct, economic losses associated with wolf predation on their livestock; however,
32 livestock producers and ranchers would still be exposed to indirect costs associated with the presence of wolves.
33 Allowing take under alternative 1 would result in additional expenses for livestock producers associated with the
34 costs (money, time, and labor) of implementing the various take strategies (Bogezi et al. 2021).

35 Lethal wildlife removal measures are frequently viewed as more efficient and cost-effective than nonlethal
36 wildlife conflict mitigation tools for minimizing cattle predation. Limited studies specific to gray wolves or
37 comparable species are available that assess the cost effectiveness of lethal versus nonlethal conflict mitigation
38 tools. However, in 2014 the Washington Department of Fish and Wildlife spent \$53,221 to manage the
39 Huckleberry Wolf Pack depredation of sheep in Stevens County, Washington, using nonlethal and lethal take
40 strategies. The costs to mitigate the pack's attack on sheep was split almost evenly between nonlethal and lethal
41 actions. However, nonlethal methods were slightly less costly than lethal take methods. The lethal take measure
42 resulted in one wolf kill. See table 4-2.

1 **Table 4-2. 2014 Huckleberry Case Preliminary Cost Estimate**

Action	Cost
Nonlethal Activity	
Washington Department of Fish and Wildlife Staff	\$18,590
Range Riders	\$2,500
Expenses	\$5,460
<i>Total Nonlethal</i>	<i>\$26,550</i>
Lethal Activity	
Washington Department of Fish and Wildlife Staff	\$4,000
Washington Department of Fish and Wildlife Expenses	\$2,080
Contractor Staff	\$5,205
Misc. Equipment	\$325
Travel	\$628
Pilot	\$1,451
Helicopter	\$8,520
Expenses	\$65
Overhead	\$4,397
<i>Total Lethal</i>	<i>\$26,671</i>
Total	\$53,221

2 Source: Landers 2014

3 **Conclusion**

4 Alternative 1 would have long-term benefits on outdoor recreation outfitters and businesses in Colorado
5 compared to the no-action alternative. Under alternative 1, the State and Tribes would have the greatest
6 management flexibility in managing the reintroduction of wolves. Alternative 1 would have lower long-term
7 direct costs on livestock producers from predation compared to the no-action alternative, but implementation of
8 alternative 1 may not completely mitigate indirect economic losses resulting from the stress levied on livestock
9 due to wolf depredation. Livestock producers could potentially incur costs for implementing nonlethal take
10 strategies.

11 **4.7.4 Alternative 2**

12 Under alternative 2, if there is an existing population of gray wolves in Colorado, the Service would issue a
13 permit under section 10(a)(1)(A) of the ESA for the management of the population outside the section 10(j)
14 experimental population boundary. A section 10(a)(1)(A) permit, like a section 10(j) rule, offers some
15 management flexibility for populations. Within the 10(a)(1)(A) area, wolves would be listed as endangered, and
16 certain nonlethal take would be allowed. However, no lethal take would be allowed in this boundary. The State
17 would establish the 10(j) experimental population boundary in those areas of the state not encompassed by the
18 section 10(a)(1)(A) permit.

19 **Impact on Outdoor Recreation**

20 Under alternative 2, socioeconomic impacts in the experimental population boundary under the section 10(j) rule
21 would be the same as those described for alternative 1. Inside the 10(a)(1)(A) permit area, outfitters and guides

1 would experience outcomes similar to those described under the no-action alternative. The State’s inability to take
2 wolves could cause a shift in the demand for big game hunting to areas without wolves.

3 **Impact on Agriculture and Livestock Production**

4 Under alternative 2, livestock operators within the limited territory of section 10(a)1(A) permit would experience
5 impacts similar to those described under the no-action alternative. Ranchers would incur higher direct and indirect
6 costs because they would have fewer take options to manage wolf predation on their livestock. Ranchers outside
7 the 10(a)1(A) permit area would have more flexibility in managing conflicts with wolves, and impacts in that area
8 would be the same as those described under alternative 1. Like alternative 1, alternative 2 would allow for lethal
9 and/or nonlethal take in most areas of the state except in parts of Jackson County and western Larimer County,
10 where section 10(a)1(A) would apply. The 10(a)1(A) permit could apply to other areas of the state if the existing
11 population of wolves is found to occupy other areas.

12 Livestock producers in areas under section 10(a)1(A) would only be allowed to use nonlethal forms of take to
13 manage wolf depredation. As a result, these producers may disproportionately incur more direct and indirect costs
14 from wolf depredation than those within the experimental population boundary.

15 **Conclusion**

16 Socioeconomic effects within the experimental population boundary under alternative 2 would be the same as
17 those described for alternative 1. Impacts to outfitters and guides would be similar to those described under the
18 no-action alternative inside the 10(a)1(A) permit area. The limited options for implementing take could lead to a
19 shift in big game hunting demand to wolf-free regions. Alternative 2 would allow for lethal and/or nonlethal take
20 in most areas of the state except in parts of Jackson County and western Larimer County, where section 10(a)1(A)
21 would apply. Livestock producers in the section 10(a)1(A) permit boundary may disproportionately incur more
22 direct and indirect costs from wolf depredation under alternative 2.

23 **4.8 ENVIRONMENTAL JUSTICE**

24 Sections 4.5, 4.6, and 4.7 assess the potential impacts of the alternatives to big game species, Tribal cultural
25 resources, and socioeconomic resources. The analysis in this section addresses whether the identified potential
26 adverse impacts to these resource areas would be disproportionately borne by the low-income, minority, and
27 Tribal environmental justice communities identified in section 3.6.

28 **4.8.1 Methodology**

29 Executive Order 12898 charges each federal agency to “make achieving environmental justice part of its mission
30 by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental
31 effects of its programs, policies, and activities on minority populations and low-income populations in the United
32 States” (59 FR 7629 §1-101). A proposed action may result in adverse impacts to the entire population; however,
33 factors that specifically affect minority, low-income, and other populations groups of concern (i.e., environmental
34 justice communities) can result in these adverse impacts being disproportionately high and adverse for
35 environmental justice communities. These factors could include limited access to financial resources, language or
36 cultural barriers, increased exposure to the adverse effects of an action, or lack of inclusion in the planning
37 process.

38 Environmental justice communities in the study area are identified in section 3.6. Disproportionately high and
39 adverse impacts to these communities are assessed based on the community’s potential exposure to the effects of
40 an alternative. In this case, exposure is determined based on the potential for conflict with wolves that would
41 require management through take under the section 10(j) rule. Potential exposure is likely to be highest in the 21
42 focal counties that contain suitable ecological conditions to support gray wolves (see section 3.1 for additional

1 discussion of the factors used to determine the focal counties). Focal counties with identified minority
2 environmental justice communities include Eagle, Garfield, Huerfano, Saguache, and Montezuma. Focal counties
3 with low-income environmental justice communities include Delta, Gunnison, Huerfano, La Plata, Larimer,
4 Mesa, Moffat, Montezuma, Montrose, Rio Blanco, Saguache, and San Miguel. Within these counties and the
5 other focal counties, other population groups of concern, including low-income and minority livestock producers
6 and outfitters and guides, as well as members of American Indian Tribes, have a greater risk of experiencing
7 potentially high and adverse impacts. Therefore, the effects analysis focuses primarily on the potential for
8 disproportionately high and adverse impacts to these population groups of concern. While the focal counties are
9 considered locations where conflicts are most likely to occur, the environmental justice analysis considers the
10 entire statewide study area.

11 A disproportionately high and adverse impact is identified if an environmental justice community is exposed to
12 potentially adverse effects of an alternative, and these impacts would be greater in severity for the environmental
13 justice community compared to the general population in the reference community (i.e., the state of Colorado).
14 For example, economic losses resulting from an alternative may result in the loss of a greater percentage of a low-
15 income livestock producer's total farm-related income, compared to the percentage of total farm-related income
16 lost for a producer with average or higher than average income. A disproportionately high and adverse impact is
17 declared when the differences in severity are substantial enough to merit agency action such as mitigation. An
18 impact may be considered disproportionately high and adverse without being considered a "significant" impact
19 under NEPA. Based on current NEPA guidance, economic or social impacts of a proposed action are not
20 considered significant unless they are interrelated with impacts to the natural or physical environment (Federal
21 Interagency Working Group on Environmental Justice & NEPA Committee 2016).

22 The analysis of environmental justice impacts assumes that the State has reached an end state for wolf
23 reintroduction, and wolves could occur in any county throughout the state but are most likely to occur in the focal
24 counties. This EIS uses a population of 200 wolves as a planning estimate, which is the threshold at which the
25 State would delist the gray wolf and manage the species as a delisted, nongame species. While environmental
26 justice impacts may occur only as isolated incidents (e.g., one-time predation of livestock), the potential for
27 impacts would occur over the long term; therefore, the impacts discussed in this section are considered to be long-
28 term impacts.

29 **4.8.2 No-Action Alternative**

30 As noted in section 4.3, populations of elk, deer, and other big game ungulate species could decline below State
31 management goals as a result of the State's reintroduction of wolves. Under the no-action alternative, gray wolves
32 would be managed as an endangered species in Colorado, and the State would not have the ability to take wolves
33 to promote conservation of big game ungulate species (see section 2.4.2, table 2-1). Impacts to big game ungulate
34 species could be long term and adverse at the local level. However, as noted in section 4.3, elk and deer
35 populations may stabilize over the long term due to natural population fluctuation.

36 Changes in populations of ungulate species, as well as depredation of livestock, under the no-action alternative
37 could affect Tribal cultural resources. Potential impacts to Tribal cultural resources are discussed in section 4.6
38 and could include economic costs as a result of livestock depredation and changes in ungulate herd movements or
39 demand for hunting permits; effects to subsistence hunters; and effects to archaeological and historical resources
40 or natural resources of cultural importance. Management of reintroduced wolves under the no-action alternative
41 would not affect osprey, which are protected by the Southern Ute Tribe or have population-level effects on the
42 black bear, which is honored by the Ute Mountain Ute and Southern Ute Tribes. This alternative may affect
43 archaeological or historical sites and the ability of Ute cultural practitioners to use these sites. Socioeconomic
44 impacts to Tribes under this alternative would be similar to the impacts discussed below and in section 4.7. If
45 wolves are present within the Brunot Area lands or on Tribal reservations, localized impacts could be

1 disproportionately high and adverse for Tribal members, particularly those who rely economically on livestock
2 production or hunting and those who rely on subsistence hunting.

3 The no-action alternative could also result in socioeconomic impacts to outfitters and guides who make their
4 living through wildlife hunting because demand for hunting may shift to areas of the state where wolves are not
5 present. An economic analysis of wolves in Montana concluded that, “overall, wolves have not had a significant
6 economic effect on elk harvest in the state. Rather, demand for hunting shifted from the southwest region near
7 Yellowstone [National Park] to areas farther away from where wolves were first introduced” (Center for Human-
8 Carnivore Coexistence 2020a; Hazen 2012). The lack of regulatory flexibility for take under this alternative could
9 result in greater long-term, localized impacts to outfitters and guides as a result of the potential for big game
10 ungulate herds to be reduced below State population goals, changes in the use of habitat by and movements of big
11 game species, and redistribution of hunting demand to other areas of the state. These localized impacts could be
12 disproportionately high and adverse for low-income and minority individuals and businesses that rely on hunting.

13 The impacts analysis for socioeconomic resources in section 3.5 notes that of the three alternatives, the no-action
14 alternative would result in the highest commercial costs for ranchers because wolves would be managed as a
15 federally listed endangered species, and take of wolves to mitigate repeated depredation of livestock would be
16 prohibited. Studies have found that livestock mortality caused by wolves is a small economic cost to the livestock
17 production industry as a whole (Center for Human-Carnivore Coexistence 2020b; Muhly and Musiani 2009). In
18 the northern Rocky Mountain region (Idaho, Montana, and Wyoming) between 1987 and 2003, the economic
19 costs of livestock mortality caused by wolves accounted for less than 0.01 percent of annual gross income from
20 livestock operations in the region. During this period gray wolves were managed as federally listed endangered
21 species in the region (Muhly and Musiani 2009).

22 While wolf depredation in circumstances when take is prohibited results in a relatively small economic cost to the
23 livestock industry, these costs are unevenly distributed and localized in places where wolves establish territories,
24 and costs to individual producers as a result of depredation may be substantial (Center for Human-Carnivore
25 Coexistence 2020b; Muhly and Musiani 2009). Wolves may also kill livestock in excess of their food needs, a
26 behavior called surplus killing. Surplus killing of livestock may occur because livestock, particularly sheep and
27 goats because of their smaller size and relative lack of defenses, are more vulnerable to predation (Center for
28 Human-Carnivore Coexistence 2020b; Muhly and Musiani 2009). Individual producers may experience economic
29 costs greater than the average for the industry across Colorado as a result of wolf depredation of livestock. For
30 low-income and minority livestock producers, these costs, as well as indirect economic costs such as those caused
31 by decreased market weights and reduced rate of conception in livestock, could be substantial under the no-action
32 alternative. Therefore, this alternative could result in disproportionately high and adverse impacts to low-income
33 and minority livestock producers, particularly in the focal counties due to the presence of suitable ecological
34 conditions for gray wolves. Under this alternative, these impacts would not be mitigated because reintroduced
35 gray wolves would be managed as an endangered species under the ESA.

36 **4.8.3 Alternative 1**

37 Under the statewide section 10(j) rule, the State of Colorado would be able to manage reintroduced wolves using
38 nonlethal and/or lethal take for the purposes of managing big game species and other wildlife consistent with
39 established State management goals, if the State has determined that wolf interactions are a major driver of
40 population declines. Therefore, alternative 1 would have a long-term, beneficial impact on big game and other
41 wildlife species. Implementation of the section 10(j) rule under this alternative would mitigate the potential for
42 big game species to decline below State management goals as a result of predation by gray wolves.

43 Under alternative 1, the Service would work with affected Tribes to develop wolf management plans that would
44 be within the provisions of the experimental population regulations. The Tribes would have the option to enter
45 into management agreements with the Service that could serve to reduce potential impacts if wolves were allowed

1 to occupy reservation lands and areas used to exercise Tribal treaty rights, such as hunting rights in the Brunot
2 Area. While effects to subsistence hunting and socioeconomic effects to outfitters and guides and livestock
3 producers still could occur under this alternative, these effects would be mitigated by involving affected Tribes in
4 planning processes to manage reintroduced wolves in accordance with the section 10(j) rule. Therefore,
5 disproportionately high and adverse effects to Tribes are not expected under alternative 1.

6 Disproportionately high and adverse impacts could occur for low-income outfitters and guides in local areas based
7 on the factors discussed under the no-action alternative. However, the potential for disproportionately high and
8 adverse impacts would be reduced under alternative 1 compared to the no-action alternative because alternative 1
9 would have the flexibility to manage reintroduced wolves to prevent significant declines in populations of big
10 game species.

11 Under alternative 1, the proposed section 10(j) rule, would cover the entire state of Colorado and allow non-
12 injurious, injurious, and lethal take under the conditions specified in table 2-2 to reduce conflicts and manage
13 wolves that repeatedly deplete livestock. Direct costs to livestock producers over the long term resulting from
14 depredation would be lower under this alternative, compared to the no-action alternative; however,
15 implementation of alternative 1 may not fully mitigate against indirect economic losses caused by stresses to
16 livestock (i.e., lower market weights and reduced rate of conception). Livestock producers also would incur costs
17 i.e., money, time, and labor) for implementing nonlethal take strategies, and these costs may be more substantial
18 for low-income and minority livestock producers. Overall, implementation of alternative 1 would result in a long-
19 term, beneficial impact to low-income and minority livestock producers compared to the no-action alternative.
20 The potential for disproportionately high and adverse impacts to low-income or minority livestock producers
21 would be reduced under this alternative compared to the no-action alternative because livestock producers would
22 be able to implement a range of nonlethal and lethal take strategies to mitigate livestock depredation.

23 **4.8.4 Alternative 2**

24 Under alternative 2, the take allowed for the purposes of managing big game and other wildlife species would be
25 the same as described under alternative 1 for areas within the proposed experimental population boundary, which
26 would cover most of the state. A portion of the state, potentially including most of Jackson County and the
27 western part of Larimer County (areas within Colorado big game management units 161, 6, 7, 16, 17, and 171)
28 would be covered under a section 10(a)(1)(A) permit that the Service would issue to the State of Colorado. Within
29 the area covered under the section 10(a)(1)(A) permit, only nonlethal take to reduce impacts to wild ungulates
30 would be allowed. While lethal take of wolves would be prohibited within the section 10(a)(1)(A) permit
31 boundary, alternative 2 would still provide the State of Colorado flexibility to manage reintroduced wolves and an
32 existing population of gray wolves to meet State population goals for big game ungulate species.

33 Impacts to people who rely on hunting for subsistence, Native American Tribes, and outfitters and guides would
34 be similar to the impacts described under alternative 1. Disproportionately high and adverse impacts to Tribes are
35 not expected because the Service would work with affected Tribes to develop wolf management plans that would
36 mitigate potential effects. Disproportionately high and adverse impacts to low-income and minority population
37 groups of concern could occur in local areas, but the potential for these impacts would be reduced compared to the
38 no-action alternative and similar compared to alternative 1.

39 Under alternative 2, impacts to low-income and minority livestock producers in areas within the section 10(j)
40 experimental population boundary would be the same as those described for alternative 1. In areas covered under
41 the section 10(a)(1)(A) permit, only nonlethal take measures, including injurious take and translocation, would be
42 allowed to address depredation on livestock. Several incidents of the existing pack in northern Colorado
43 depredating livestock have been documented in Jackson County (Blumhardt 2022). Proactive, nonlethal strategies
44 can reduce the potential for livestock depredation. However, some tactics, such as fladry (i.e., a nonlethal tool
45 designed to protect livestock from predation by creating a visual barrier to wolves) or other physical or

1 psychological barriers, may only be effective temporarily, and there are costs to planning and implementing these
2 strategies. Low-income and minority livestock producers may have fewer financial resources available to
3 implement nonlethal take strategies or may be less likely to use government programs to manage depredation
4 risks. Within the section 10(a)(1)(A) permit boundary, impacts to low-income and minority livestock producers
5 would be slightly reduced compared to the no-action alternative; however, these impacts may still be
6 disproportionately high and adverse due to the cost of implementing nonlethal take measures.

7 As of September 2022, details on the State of Colorado’s wolf management plan are not publicly available, and
8 potential strategies that may reduce or mitigate effects on low-income and minority population groups of concern
9 could not be evaluated. It is also important to note that an existing population of gray wolves may be identified in
10 areas of the state outside the potential section 10(a)(1)(A) permit boundary. Therefore, the impacts discussed
11 under alternative 2 may occur in other areas of the state.

12 **4.9 CUMULATIVE IMPACTS AND OTHER CONSIDERATIONS**

13 **4.9.1 Cumulative Impacts**

14 CEQ regulations stipulate that the cumulative effects analysis within an EIS should consider the potential
15 environmental impacts resulting from “the incremental impacts of the action when added to past, present, and
16 reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes
17 such actions” (40 CFR 1508.7). CEQ interprets this regulation as referring only to the cumulative impact of the
18 direct and indirect effects of the proposed action and its alternatives when added to the aggregate effects of past,
19 present, and reasonably foreseeable future actions (CEQ 2005).

20 Cumulative impacts were determined by combining the impacts of each alternative with the impacts of other past,
21 present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing, or
22 reasonably foreseeable future projects and plans within the area of analysis, and if applicable, the surrounding
23 region. Past actions are those that have occurred or have been occurring related to the gray wolf, and reasonably
24 foreseeable future projects are those that are likely to occur within the life of the plan. Following CEQ guidance,
25 past actions were included, “to the extent that they are relevant and useful in analyzing whether the reasonably
26 foreseeable effects of the agency proposal for the actions and its alternatives may have a continuing, additive, and
27 significant relationship to those effects” (CEQ 2005).

28 The cumulative impact analysis used the following four steps:

29

- Step 1 — Identify Resources Affected

30 Fully identify resources affected by any of the alternatives. These include the resources addressed as
31 impact topics in chapters 3 and 4 (this chapter) of this document.

32

- Step 2 — Set Boundaries

33 Identify an appropriate spatial and temporal boundary for each resource. The temporal boundaries extend
34 from when wolves were extirpated in Colorado through the life of the plan (limited to those future actions
35 where impacts could be reasonably predicted). The spatial boundary is the state of Colorado and the focal
36 counties identified in Chapter 2.

37

- Step 3 — Identify Cumulative Action Scenario

38 Determine which past, present, and reasonably foreseeable future actions to include for each resource.
39 Reasonably foreseeable future actions include those federal and non-federal activities not yet undertaken,
40 but sufficiently likely to occur, that a reasonable official would take such activities into account in
41 reaching a decision. These activities include, but are not limited to, activities for which there are existing

1 decisions, funding, or proposals identified. Reasonably foreseeable future actions do not include those
2 actions that are highly speculative or indefinite (43 CFR 46.30).

3 ▪ Step 4 — Cumulative Impact Analysis

4 Assess impacts of these other actions plus impacts of each alternative, to arrive at the total cumulative
5 impact of each alternative and each alternatives contribution. This analysis is included below.

6 The analysis of cumulative impacts focuses on the resource areas of biological resources (gray wolf, species of
7 special concern, and other species), Tribal resources, socioeconomics, and environmental justice. The analysis of
8 cumulative impacts is descriptive rather than technical or analytical; this scale and scope is appropriate based on
9 the proposed action being a relatively narrow in scope for which no significant adverse impacts are identified in
10 any resource area.

11 **Past, Present, and Reasonably Foreseeable Future Actions**

12 *Northern Rocky Mountain Wolf Recovery Plan*

13 The *Northern Rocky Mountain Wolf Recovery Plan* outlines steps for recovery of gray wolf populations in
14 portions of their former range in the northern Rocky Mountains of the United States. Historical evidence
15 documents the presence of gray wolves throughout the northern Rocky Mountains of the contiguous United
16 States. This subspecies (*Canis lupus irremotus*) was a predator on native ungulates under pristine conditions and
17 later, as European Americans spread westward, on domestic livestock. Substantial declines in wolf numbers
18 resulted from control efforts to reduce livestock and big game depredations. This plan was developed in 1980
19 (and revised in 1987). The plan states that in order to achieve biological recovery, a population of at least 30
20 breeding pairs and 300 wolves equitably distributed among the three recovery areas for at least three years was
21 necessary, and since its implementation, the reintroduction of wolves to Yellowstone National Park and central
22 Idaho have greatly expanded the numbers and distribution of wolves in the northern Rocky Mountain region. The
23 population goal was reached in 2000. In early 2020, the Idaho Department of Fish and Game reported a
24 population estimate of 1,541 wolves during the summertime population peak. In 2017, the final year Montana
25 conducted minimum counts of wolves, there was a minimum of 633 wolves. At the end of 2019, there were 311
26 wolves in Wyoming (USFWS 2020c).

27 *The State of Colorado Wolf Reintroduction*

28 Proposition 114, now Colorado Revised Statue 33-2-105.8, directs the CPW Commission to develop a plan to
29 introduce gray wolves in Colorado west of the Continental Divide, passed on November 3, 2020. The statute
30 directs the CPW Commission to restore and manage gray wolves in Colorado no later than December 31,
31 2023. This plan calls for...to be filled in when the plan is available.

32 *Mexican Wolf Reintroduction*

33 The Mexican wolf (*Canis lupus baileyi*) is listed as an endangered species protected by the ESA. In the United
34 States, the Service is the federal agency responsible for the recovery of the Mexican wolf. A central focus of
35 recovery efforts for the Mexican wolf has been the reintroduction of the Mexican wolf to the wild from captivity
36 due to the extirpation of the Mexican wolf in the wild prior to ESA protection. The Service is conducting the
37 reintroduction of the Mexican wolf under section 10(j) of the ESA and regulations at 50 CFR 10 17.81. The
38 Service began reintroducing captive-bred Mexican wolves into the Mexican Wolf Experimental Population Area
39 (MWEPA) in Arizona and New Mexico in 1998 pursuant to its January 12, 1998, rule (63 FR 1752). In 2017, the
40 Service finalized the *Mexican Wolf Recovery Plan, First Revision* (revised recovery plan) in coordination with
41 federal agencies in Mexico and state, federal, and Tribal agencies in the United States. The revised recovery plan
42 provides a strategy, criteria, and actions to recover the Mexican wolf and solidifies the significant role of the
43 MWEPA in the recovery of the Mexican wolf. The revised recovery plan clarifies the specific contribution needed
44 from the MWEPA for the range-wide recovery of the Mexican wolf by establishing demographic, genetic, and

1 regulatory recovery criteria for a population of Mexican wolves in the United States. The revised recovery plan
2 also calls for a second population of Mexican wolves in Mexico and provides criteria for that population (USFWS
3 2022f).

4 The status of the Mexican wolf population in the MWEPA has improved under the 2015 10(j) rule. The minimum
5 population count in 2020 of 186 wolves, including 20 breeding pairs (wolves that produced pups and at least one
6 pup survived until the end of the year), continues a trend of steady population growth over the last six years.
7 Mexican wolves have expanded their range under the 2015 10(j) rule, from 7,255 square miles (18,790 square
8 kilometers) in 2014 to 19,495 square miles (50,492 square kilometers) in 2020. Based on this numeric and
9 geographic expansion, the Service considers the MWEPA population to be stable and growing steadily, which is
10 consistent with the ongoing demographic recovery needs of the Mexican wolf. Illegal killing of Mexican wolves
11 continues to occur in the MWEPA, but population growth has been robust in recent years despite these losses.
12 The Service continues to investigate illegal killings, increase the presence of law enforcement, and conduct
13 community outreach and education to address this problem (UWFWS 2022f).

14 **4.9.2 Cumulative Impacts Analysis**

15 **Biological Resources (Gray Wolves, Special Status Species and Other Wildlife)**

16 *Northern Rocky Mountain Wolf Recovery Plan*

17 The objectives of the *Northern Rocky Mountain Wolf Recovery Plan*—to have a population of at least 30 breeding
18 pairs and 300 wolves equitably distributed among the three recovery areas in Montana, Idaho, and Wyoming for
19 at least three years—was achieved in 2000. This reintroduction has benefited the species recovery in western
20 United States in the long term; there are now viable populations of wolves on their native historic range, and
21 individuals have been documented dispersing naturally into adjacent states, including Colorado (Carroll et al.
22 2021). The recovery of wolves in the northern Rocky Mountains has influenced population size and behavior of
23 other wildlife species through predation and competition, as described in section 3.2.1. Long-term, adverse
24 impacts to other wildlife, including species of special concern, have not been documented as a result of
25 implementation of the *Northern Rocky Mountain Wolf Recovery Plan*.

26 *Impacts from the State Plan*

27 The State of Colorado’s reintroduction of the gray wolf would benefit the species, which was extirpated from
28 Colorado by the mid-1940s by government-sponsored predator control programs (Carhart 2017, as cited in Ditmer
29 2022). Reintroducing the gray wolf, a federally endangered species in 44 states, into its native historic range
30 would promote recovery resulting in long-term, beneficial impacts to the species. Reintroducing gray wolves in
31 Colorado could also affect other wildlife, including other federally listed species, state-listed species, and other
32 SGCN. Wolves are apex predators, meaning that they occupy the top trophic level in food webs. The
33 reintroduction of wolves could affect other species in the state directly, through predation and competition, or
34 indirectly through behavioral changes. Effects could be both adverse and beneficial.

35 Wolves are native to Colorado and their reintroduction could benefit some species, such as small mammals and
36 birds, by indirectly reducing predation pressure by other predators, such as coyotes, which may change their
37 feeding behaviors in the presence of wolves (Ripple and Beschta 2012; Dobson 2014). However, because wolves
38 are also predators, their reintroduction could place additional predation pressure on some species, such as the
39 federally threatened Gunnison sage-grouse and other ground-nesting birds, potentially resulting in adverse
40 impacts. Wolves may also compete with other predators including the federally threatened Canada lynx. Wolves
41 may compete with other predators for food resources, hunting territory or home range, or other limiting resources.
42 In the presence of wolves, other predators may change their behaviors (e.g., prey selection and hunting ranges) to
43 avoid areas where wolves are present, as was observed in mountain lions following the reintroduction of wolves
44 at Yellowstone National Park (Bartnick et al. 2013).

1 The reintroduction of wolves may have the greatest effects on prey species, especially ungulates such as elk and
2 deer. Changes in ungulate population dynamics may or may not be directly influenced by wolf presence. Prey
3 populations naturally vary through time in response to environmental factors (e.g., severe winters, natural
4 mortality), predation pressure by carnivores (in Colorado, wolves would compete primarily with black bears and
5 mountain lions), hunter harvest pressure, and habitat conditions. Ungulate populations could experience localized
6 population declines in the short term due to increased predation pressure from wolves. However, it is likely that
7 populations would stabilize over the long term (Smith et al. 2003), so long-term, adverse effects are not
8 anticipated. Additionally, reintroducing wolves could benefit ungulates by regulating population size. In the
9 absence of an apex predator, abundant ungulate species such as elk and deer can exceed optimal levels, resulting
10 in reduced population health due to food resource limitation (Dobson 2014; NPS 2022b). Apex predators can also
11 improve overall prey population health by limiting the spread of disease (e.g., chronic wasting disease in elk and
12 deer and brucellosis in bison) as weaker animals are removed from the population via predation (Dobson 2014).

13 *Impacts from Mexican Wolf Reintroduction*

14 The reintroduction of the Mexican wolf would result in direct beneficial impacts to the Mexican wolf population.
15 The 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental*
16 *Population of the Mexican Wolf* reports that increased predation pressure from Mexican wolves could adversely
17 affect ungulate populations but finds that these impacts would be less than significant. The 2022 EIS reports at the
18 time of publication that there were no data suggesting that Mexican wolves were currently having a significant or
19 observable negative impact on prey populations (USFWS 2022f); therefore, it is expected that such impacts may
20 occur at larger Mexican wolf population sizes and higher wolf densities than the current situation. The 2022 EIS
21 did not evaluate effects to other wildlife including other federally or state-listed species.

22 *Impacts from the Proposed Action*

23 The proposed action would have long-term, direct and indirect, beneficial effects on wild ungulates because
24 management flexibility afforded to the State would allow the State to take a limited number of wolves using
25 nonlethal and/or lethal methods as a means to achieve its established goals for the statewide management of
26 ungulate populations if the reintroduction of wolves resulted in an unacceptable impact to their populations. The
27 proposed action could result in short- or long-term, adverse effects on some species of special concern, such as
28 the federally threatened Gunnison sage-grouse and other ground-nesting birds if their populations decline as a
29 result of wolf reintroduction because, if populations of species of special concern declined as a result of wolves,
30 the State would not have the flexibility to manage wolves using nonlethal or lethal methods to promote
31 conservation or recovery of protected species. However, the no-action alternative is not likely to adversely affect
32 species of special concern because substantial population declines of species of special concern have not been
33 documented as a result of previous wolf reintroductions elsewhere in North America.

34 *Cumulative Impact*

35 When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably
36 foreseeable future actions, direct and indirect impacts on biological resources would be mostly beneficial. Wolves
37 may reduce predation pressure on some prey species by causing other predators to change their hunting behaviors.
38 Wolves could cause wildlife ungulates to decline, but if their populations declined below established management
39 goals, the State would have the flexibility to manage wolves using nonlethal and/or lethal take for the
40 conservation of wild ungulates. Wolves could adversely affect some prey species, such as the federally threatened
41 Gunnison sage-grouse and other ground-nesting birds, but significant adverse impacts are not anticipated over the
42 long term.

1 **Ecosystem Dynamics**

2 *Northern Rocky Mountain Wolf Recovery Plan*

3 The impact on ecosystem dynamics following the reintroduction of wolves to their native range in the northern
4 Rocky Mountains has been well documented in the scientific literature (Smith et al. 2003; Ripple and Beschta
5 2012). Documented effects of wolf reintroduction and recovery at Yellowstone National Park have included
6 reduced herbivory pressure on woody vegetation, leading to a resurgence of species such as willow, aspen, and
7 cottonwood in some areas, which was followed by increases in beaver and bison populations and an increase in
8 the abundance and diversity of riparian bird species (Hollenbeck and Ripple 2007; Ripple and Beschta 2012;
9 Dobson 2014). Effects of wolf reintroduction in Yellowstone are discussed in greater detail in section 3.2.1.
10 Overall, effects of wolf recovery in the northern Rocky Mountains has had long-term beneficial impacts on
11 ecosystem dynamics. It is expected that similar changes in ecosystem dynamics will continue to occur over the
12 long term as wolves from the northern Rocky Mountains disperse into new areas.

13 *Impacts from the State Plan*

14 Reintroduction of the gray wolf in Colorado could affect community structure and ecosystem dynamics in the
15 state. As an apex predator, wolves can have a strong top-down effect on the trophic structure of ecosystems by
16 regulating other wildlife populations through predation and behavioral responses, potentially resulting in trophic
17 cascades (Estes et al. 2011; Ripple and Beschta 2012; Ripple et al. 2014). This process is described in greater
18 detail in section 3.2.1.

19 Reintroducing wolves in Colorado could indirectly affect vegetation community structure and successional state
20 by controlling herbivore populations via predation and behavioral responses of prey, in turn reducing grazing
21 pressure on some types of vegetation. As noted in section 3.2.1, top-down trophic effects on vegetative
22 communities as well as other wildlife species following reintroduction or recovery of wolves have been observed
23 in other ecosystems in the United States and Canada (McLaren and Peterson 1994; Hebblewhite et al. 2005;
24 Callan et al. 2013). Therefore, it is reasonable to anticipate that similar effects could be anticipated following the
25 introduction of wolves in Colorado.

26 Overall, reintroducing wolves to Colorado could directly and indirectly benefit ecosystem dynamics over the long
27 term by controlling prey populations, regulating predation by coyotes and other mesopredators, and shaping
28 vegetation community structure and succession by influencing herbivore abundance and behaviors. Overall, these
29 potential changes would benefit ecosystem dynamics in Colorado over the long term by restoring a more natural
30 ecosystem structure.

31 *Impacts from Mexican Wolf Reintroduction*

32 The 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental*
33 *Population of the Mexican Wolf* does not evaluate impacts on ecosystem dynamics. However, it can be inferred
34 that the reintroduction of the Mexican wolf would result in environmental consequences similar to those described
35 above for the reintroduction of the gray wolf in Colorado, resulting in long-term, beneficial impacts because
36 ecosystem dynamics would be restored to a more natural state.

37 *Impacts from the Proposed Action*

38 Flexibility for the management of reintroduced gray wolves as an experimental population would not affect
39 ecosystem dynamics because potential effects on ecosystem dynamics would occur as a result of the State action,
40 regardless of the management option selected.

41 *Cumulative Impact*

42 When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably
43 foreseeable future actions, direct and indirect impacts on ecosystem dynamics would be beneficial. The presence

1 of wolves in Colorado could restore a more natural ecosystem structure by controlling prey populations,
2 regulating predation by coyotes and other mesopredators, and influencing vegetation community structure and
3 succession.

4 **Tribal Resources**

5 *Northern Rocky Mountain Wolf Recovery Plan*

6 The *Northern Rocky Mountain Wolf Recovery Plan* (USFWS 1987) does not provide information directly noted as
7 Tribal resources. However, the plan does discuss the habitat requirements, including a discussion of denning,
8 which could affect rock shelters, and prey selection, which could affect potential natural resources of cultural
9 importance. The plan further discusses wolf-human interactions, which could affect Tribal hunting and livestock.
10 The geographic area considered as part of this plan includes northwestern Montana, central Idaho, and the Greater
11 Yellowstone area (USFWS 1987; U.S. Department of Justice 2018). For this analysis of cumulative impacts, the
12 wolf management plans for Montana, Idaho, and Wyoming were reviewed.

13 The *Montana Wolf Conservation and Management Plan* does not directly address Tribal resources. It
14 acknowledges that Tribes maintain wildlife management authority on tribally owned lands and the need for
15 coordination among the State, Tribes, and other parties in the management of wolves (MFWP 2002). In
16 considering potential natural resources of cultural importance, the plan indicates that Montana intends to manage
17 the gray wolf within the “existing management framework, programs, and policies for other carnivores, such as
18 mountain lions and black or grizzly bears” (MFWP 2002). The Montana plan also acknowledges the need to
19 manage ungulate populations for hunting. Elk, white-tailed deer, mule deer, and moose are noted in the plan as
20 the primary prey species of wolves in Montana. The plan adopts an adaptive management program for mule deer
21 and informally applies adaptive management strategies to elk, white-tailed deer, and moose management (MFWP
22 2002).

23 Similarly, the Idaho Department of Fish & Game establishes the need to consult with Tribes and acknowledges
24 their management authority on Tribal lands in its state management plan. The plan indicates “Tribes with
25 reservations or reserved rights in Idaho manage fish and wildlife species with authorities that are similar to, but
26 separate from, the State of Idaho.” The plan further notes the potential for coordination regarding the monitoring
27 of wolves that border or range into neighboring states (Idaho Legislative Wolf Oversight Committee 2002).
28 Similar to the Montana and Idaho management plans, the State of Wyoming Gray Wolf Management Plan
29 acknowledges the necessary input of Tribes. It includes a statement in which the Service notes its encouragement
30 of Tribes to define unacceptable impacts to ungulate populations (Wyoming Fish and Game Commission 2011).

31 *Impacts from the State Plan*

32 Colorado Revised Statue 33-2-105.8 directs the CPW Commission to develop a plan to introduce gray wolves in
33 Colorado, during which CPW would continue to work with Tribes in the development of the plan. The impacts
34 associated with the State Plan are similar to those noted in section 4.6.1 for the no-action alternative. As shown in
35 this section, impacts could occur to natural resources of cultural importance to Tribes. Due to the limited
36 management options, specific management goals would need to be addressed for these resources in the final plan
37 to reduce potential impacts. In addition, impacts are anticipated on hunting resources and livestock. As shown in
38 section 4.6.1 and in the discussion of biological resources, hunting-related benefits are not anticipated to decline
39 across the state, although impacts may be experienced at a local level, where wolves may contribute to declines in
40 big game herds. No take provisions would be included,, lethal or nonlethal, to address wolves if they reduce the
41 population of big game ungulates below State management goals with implementation of the State Plan. As noted
42 in section 4.7.1, in the short term, wolf depredation on domestic livestock would likely be minimal, but after wolf
43 recovery levels are approached, depredation loses are anticipated to increase. As part of its Gray Wolf
44 Management Plan, CPW outlined that compensation would be addressed for potential impacts associated with
45 wolf depredation.

1 *Impacts from Mexican Wolf*

2 The effects of the reintroduction of the Mexican wolf on Tribal resources are evaluated as part of the
3 environmental justice discussion in the 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations*
4 *for the Nonessential Experimental Population of the Mexican Wolf* (USFWS 2022f). This evaluation considers the
5 potential impacts to the White Mountain Apache Tribe, San Carlos Apache Tribe, the Navajo Nation (including
6 Ramah Navajo and the Alamo Band), Mescalero Apache Tribe, Pueblo of Zuni, Pueblo of Acoma, Pueblo of
7 Isleta, and the Pueblo of Laguna. It largely focuses on areas within Arizona and New Mexico. The EIS considers
8 ranching/livestock production and big game hunting. The analysis accounts for a source-pathway-resources-
9 acceptance approach, in which wolf behavior (depredation, predation, and nuisance behavior) and loss of access
10 to resources was considered (USFWS 2022f).

11 As noted in the EIS for the Mexican wolf, Tribal governments would have the option to enter into management
12 agreements with the Service to manage Mexican wolves on their Tribal trust lands. The EIS indicates that impacts
13 would occur and could be disproportionate to the Tribes, but with the potential for management agreements to be
14 established, these impacts would be reduced. The EIS cites the White Mountain Apache Tribe as a Tribe that
15 experienced low costs from depredation and insignificant impacts to big game populations due to the presence of
16 wolves on the Fort Apache Indian Reservation (USFWS 2022f).

17 *Impacts from the Proposed Action*

18 Under the proposed action, which includes the use of a section 10(j) rule, the reintroduction of wolves could
19 affect natural resources of importance to Tribes in part due to competition resulting in changes to predation habits
20 or habitat selection. With the implementation of the 10(j) rule, however, the State and Tribes would have
21 management options to address or assist in the reduction of these impacts.

22 In addition, the reintroduction of wolves could affect wildlife species that are hunted or used by the Tribes, such
23 as elk, deer, and other ungulates. As shown in the discussion of biological resources, elk and deer populations
24 could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. However,
25 the proposed action would provide the State and Tribes flexibility in managing wolves to limit elk and deer
26 population decline or to facilitate recovery; the same could occur for pronghorn, wild sheep, bison, and moose.

27 Potential impacts associated with wolf depredation on domestic livestock also could occur under the proposed
28 action. However, the State and Tribes would have management options to address or assist in the reduction of
29 these impacts.

30 *Cumulative Impact*

31 When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably
32 foreseeable future actions, impacts on Tribal resources as they relate to hunting and to livestock are anticipated.
33 Cumulative impacts would generally be associated with the placement of wolves within the landscape and their
34 potential interactions with animals hunted by Tribal members and livestock, and the proposed action would make
35 up a small portion of the impact because it would provide beneficial impacts that would address adverse impacts
36 from other actions.

37 With implementation of the proposed action, reintroduced wolves would be managed to reduce adverse effects to
38 big game ungulate species and livestock as described in sections 4.5, 4.7, and 4.8 of this EIS. As noted in the
39 discussion of biological resources, above, wolves could cause wildlife ungulates to decline, but if their
40 populations declined below established management goals, the State and Tribes would have the flexibility to
41 manage wolves using nonlethal and/or lethal take for the conservation of wild ungulates. Similar management
42 options are available as part of the *Northern Rocky Mountain Wolf Recovery Plan* and for the Mexican wolf
43 through the implementation of the state management plans, some of which address migrating wolves and

1 relocation. In this manner, cumulative impacts to hunting resources (e.g., ungulates) are anticipated to be minimal,
2 and the management actions associated with the proposed action would reduce cumulative impacts.

3 As shown below for socioeconomics and environmental justice, the long-term, beneficial impacts from increased
4 management flexibility under the proposed action and compensation programs implemented as part of the State
5 Plan would reduce the potential for substantial economic costs to livestock producers, which would include Tribal
6 members. In this manner, while cumulative impacts would occur to livestock, they would be reduced through the
7 use of management tools and compensation.

8 **Socioeconomics**

9 *Northern Rocky Mountain Wolf Recovery Plan*

10 As noted in sections 4.7.2, a small number of gray wolves from the northern Rocky Mountain region have
11 dispersed into Colorado, and in a limited number of incidents, have depredated livestock in northern Colorado,
12 resulting in socioeconomic impacts to a small number of livestock producers. As noted in section 4.7.2, studies
13 show that overall livestock deaths caused by wolves were less than anticipated. In the northern Rocky Mountain
14 region, less than 1 percent of annual gross income was lost to wolf predation on cattle and sheep between 1987
15 and 2003 (Center for Human-Carnivore Coexistence 2020b; Muhly and Musiani 2009). This trend is expected to
16 continue.

17 *Impacts from the State Plan*

18 Impacts from the State Plan would result from the reintroduction of wolves and the implementation and
19 management of the reintroduction. Impacts from the State Plan were considered without the 10(j) rule in place
20 and are discussed in this EIS under the no-action alternative, including limited management flexibility that would
21 result in long-term, adverse impacts to outfitters and livestock producers.

22 *Impacts from Mexican Wolf Reintroduction*

23 The reintroduction of the Mexican wolf is expected to have direct effects on socioeconomics from cattle
24 depredations in addition to the indirect effects to reduce the likelihood of depredations. The 2022 *Final*
25 *Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental Population of*
26 *the Mexican Wolf* found that the overall loss of livestock attributable to wolf depredations is estimated to have
27 been over \$3.6 million (\$2020) between 1998 and 2019. While the overall market impact of wolf depredations is
28 minimal compared to the total annual value of Arizona and New Mexico cattle operations, the impacts felt by
29 ranches that incur actual depredations on their herds can be more substantial. The EIS also found that while there
30 could be impacts to ungulates and big game hunting, these impacts would be mitigated though the removal of
31 wolves causing unacceptable impacts, resulting in less than significant adverse impacts (USFWS 2022f).

32 *Impacts from the Proposed Action*

33 The proposed action would have long-term, beneficial impacts on outdoor recreation outfitters and livestock
34 producers because the allowable lethal and nonlethal take would provide management flexibility and help mitigate
35 economic losses to these groups. Under alternative 1, the Service and its authorized agents, including the State
36 and Tribes, could use nonlethal and/or lethal take to mitigate the risk that ungulate populations decrease below
37 State and Tribal population goals. Similarly, livestock producers would be able to address chronic depredation
38 though lethal and nonlethal measures to reduce the financial impact. Although the 10(j) rule would mitigate
39 impacts, these groups would still experience some adverse impacts related to the possibility of ungulate herds to
40 move or depredation of livestock.

41 *Cumulative Impact*

42 When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably
43 foreseeable future actions, direct and indirect impacts on socioeconomics would result in long-term, adverse

1 impacts to outfitters and livestock producers. The long-term, beneficial impacts from increased management
2 flexibility under the proposed action and compensation programs implemented as part of the State Plan would
3 reduce the potential for substantial economic costs to low-income and minority population groups of concern,
4 including outfitters and guides and livestock producers.

5 **Environmental Justice**

6 *Northern Rocky Mountain Wolf Recovery Plan*

7 As noted in sections 2.4 and 4.8.4, a small number of gray wolves from the northern Rocky Mountain region have
8 dispersed into Colorado and depredated livestock in a limited number of instances in northern Colorado, resulting
9 in socioeconomic impacts to a small number of livestock producers. The EIS for the *Northern Rocky Mountain*
10 *Wolf Recovery Plan* did not assess potential environmental justice impacts because this EIS was completed about
11 two months after Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority*
12 *Populations and Low-Income Populations*, was signed and before guidance for addressing environmental justice
13 in the NEPA process was issued. The socioeconomic impacts of the gray wolf reintroduction in the northern
14 Rocky Mountain region are discussed in section 4.7 and include impacts to guides and outfitters and livestock
15 producers. The environmental justice impacts are expected to be similar to the effects discussed in section 4.8 of
16 this EIS but may vary depending on the regulatory environment in each state in the region (Idaho, Wyoming, and
17 Montana).

18 *Impacts from the State Plan*

19 Impacts from the State Plan would result from the reintroduction of wolves and implementation and management
20 of the reintroduction. Impacts from the State Plan were considered without the section 10(j) rule in place, and are
21 discussed in this EIS under the no-action alternative. As discussed in section 4.8.2, under the no-action
22 alternative, predation on elk and other big game ungulate species could reduce herds below State population
23 goals, change the use of habitat by and movements of big game species, and redistribute hunting demand to other
24 areas of the state. While impacts statewide are not likely to result in substantial economic effects, localized
25 impacts could be disproportionately high and adverse for members of Native American Tribes and low-income
26 and minority individuals and businesses that rely on hunting.

27 Similarly, impacts to livestock producers, including Tribal producers, from wolf depredation of livestock would be
28 unevenly distributed and localized. Individual producers may experience economic costs greater than the average for
29 the industry across Colorado. For low-income and minority livestock producers these costs, as well as indirect
30 economic costs, could be substantial under the no-action alternative. Therefore, implementation of the State Plan could
31 result in disproportionately high and adverse impacts to low-income and minority livestock producers, particularly in
32 the focal counties.

33 *Impacts from Mexican Wolf*

34 The 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental*
35 *Population of the Mexican Wolf* considers the impacts to environmental justice populations in Arizona and New
36 Mexico and found that small ranch operations that are marginally most at risk from economic losses and that have
37 a high percentage of focus minority groups identified as principal operators could suffer high and disproportionate
38 adverse impacts from implementation of the proposed action and alternatives. The final EIS further notes that
39 disproportionate and adverse impacts could occur because some Tribal members subsist on big game. Populations
40 with smaller land bases and lower big game densities could be further impacted. This effort would have minimal
41 adverse effects on Tribes because Tribal governments could request wolf removal at any time. However, Tribes as
42 population groups of concern are marginally more at risk from economic losses that may affect their primary
43 source of income. Furthermore, for some Tribes and Tribal members, livestock are used for subsistence. For these
44 reasons, Tribal population groups of concern could suffer high and disproportionate adverse impacts from
45 implementation of the proposed action and alternatives.

1 *Impacts from the Proposed Action*

2 The proposed action would have a long-term, beneficial impact on big game species because the State of
3 Colorado and affected Tribes would be able to manage reintroduced wolves using nonlethal and/or lethal take to
4 mitigate population declines below State management goals. Therefore, disproportionately high and adverse
5 impacts to people who rely on hunting for subsistence, including members of Native American Tribes, are not
6 anticipated.

7 Disproportionately high and adverse impacts could occur for low-income outfitters and guides in local areas due
8 to the potential for a shift in demand for hunting permits away from areas where wolves are present and changes
9 in the use of habitat by or movements of big game species (see section 4.8.2).

10 The proposed section 10(j) rule would allow non-injurious, injurious, and lethal take under the conditions
11 specified in table 2-2 to reduce conflicts and manage wolves that repeatedly deplete livestock. Implementation
12 of alternative 1 may not fully mitigate against indirect economic losses caused by stresses to livestock (i.e., lower
13 market weights and reduced rate of conception). Livestock producers also would incur costs (i.e., money, time,
14 and labor) for implementing nonlethal take strategies, and these costs may be more substantial for low-income
15 and minority livestock producers. Overall, implementation of the proposed action would result in a long-term,
16 beneficial impact to low-income and minority livestock producers.

17 *Cumulative Impact*

18 The proposed action would mitigate the adverse effects of implementation of the State Plan on low-income and
19 minority environmental justice population groups of concern. With implementation of the proposed action,
20 reintroduced wolves would be managed to reduce adverse effects to big game ungulate species and livestock as
21 described in section 4.8 of this EIS. Therefore, the proposed action would not result in cumulatively greater
22 adverse effects to minority or low-income population groups of concern in combination with the State Plan.

23 Additionally, as part of the State Plan, Colorado is considering a range of policies for compensation to livestock
24 producers whose livestock have been depredated by reintroduced gray wolves. Along with the management
25 flexibility that would be provided under the section 10(j) rule, compensation would mitigate potential economic
26 effects to minority or low-income livestock producers. Depending on the level of compensation provided by the
27 state, these economic effects may not be fully mitigated. Details on compensation that would be provided by the
28 state under various circumstances are not publicly available as of September 2022.

29 Reintroduction of gray wolves to the northern Rocky Mountain region could have cumulative impacts on
30 environmental justice population groups of concern in Colorado as wolves disperse into Colorado. Naturally
31 dispersing wolves would increase the number of wolves in Colorado above the number reintroduced by the state
32 and increase the geographic area of the state in which wolves occur. Cumulatively, a greater number of low-
33 income and minority livestock producers and outfitters and guides could be affected, and these effects could be
34 disproportionately high and adverse as described in section 4.8.

35 The study area for reintroduction of a nonessential experimental population of the Mexican wolf includes the
36 states of New Mexico and Arizona. The experimental population boundary for reintroduced Mexican wolves (the
37 MWEPA) is bounded on the north by Interstate 40, on the east by the eastern state line of New Mexico, on the
38 west by the western state line of Arizona, and on the south by the international border with New Mexico. The
39 Service is proposing to remove or translocate back into the MWEPA any wolves that disperse outside this
40 boundary (USFWS 2022f). Therefore, it is unlikely that reintroduced Mexican wolves would become established
41 in Colorado, and cumulative effects to minority or low-income population groups of concern in Colorado are not
42 anticipated.

43 The section 10(j) rule for reintroduced gray wolves in Colorado would allow the State or other designated agents
44 to translocate any gray wolves that leave the experimental population boundary back to suitable habitat in

1 Colorado. If gray wolves dispersing from Colorado are identified in neighboring states and are affecting livestock
2 producers, outfitters and guides, or others, these wolves could be captured and translocated. Alternatively,
3 dispersing wolves would be managed under the federal or state regulations that apply in the area where they are
4 found (for example, wolves would be managed as endangered in Utah and as a federally delisted species in
5 Wyoming). Because of the provisions in the section 10(j) rule for translocation, dispersing gray wolves outside
6 Colorado are not expected to result in cumulative impacts to environmental justice populations in New Mexico,
7 Arizona, or the northern Rocky Mountain region.

8 When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably
9 foreseeable future actions, direct and indirect impacts on minority and low-income population groups of concern
10 could be disproportionately high and adverse but would be mitigated. Increased management flexibility under the
11 proposed action and compensation programs implemented as part of the State Plan would reduce the potential for
12 substantial economic costs to low-income and minority population groups of concern, including outfitters, guides,
13 and livestock producers.

14 **4.9.3 Regulatory Compliance and Consistency with Approved State or Local Plans or Laws**

15 This EIS was prepared in compliance with the federal acts and executive orders as described in Appendix A as
16 well as the: Administrative Procedures Act of 1946; ESA of 1973; Federal Land Policy and Management Act of
17 1976; Fish and Wildlife Coordination Act; NEPA of 1969; National Forest Management Act of 1976; National
18 Historic Preservation Act of 1966; Regulatory Flexibility Act 21 of 1980; Unfunded Mandates Reform Act of
19 1995; Wilderness Act of 1964; Executive Order 12372, *Intergovernmental Review of Federal Programs*;
20 Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-*
21 *Income Populations*; Executive Order 13045, *Protection of Children from Environmental Health Risks and*
22 *Safety*; and Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*.

23 These included plans or laws such as state statutes and regulations related to the release or management of
24 predators, Natural Resource Conservation District long-range plans, and Soil and Water Conservation District
25 resolutions related to the reintroduction of endangered predators. NEPA’s intent and governing regulations direct
26 federal agencies to “cooperate, consult and coordinate” with the county or conservation district in the
27 development of plans, decisions, activities or actions which may affect the county, the district or its residents,
28 especially related to early and ongoing planning, coordination, and consultation with state and local governments
29 and stakeholders (40 CFR 1501.8, 1501.9). During the development of this EIS, the Service worked with
30 cooperating agencies to determine whether additional local plans or laws should be considered based on the scope
31 of our proposed action and alternatives.

32 Additional relevant local plans or laws include:

- 33 ▪ State of Colorado. Colorado Code § 33-2-105.5 (2021)
- 34 ▪ State of Colorado. Colorado Code § 33-6-203 (2021)
- 35 ▪ State of Colorado. Colorado Code § 33-6-207 (2021)
- 36 ▪ State of Colorado. Colorado Wildlife Commission Regulation 2 CCR 406-17-XII-17122 (2020)

37 To the extent that any of these plans or laws establish a local (state or county) process to request management
38 action by the Service or a designated agency to address wolf-human conflicts and that this process is consistent
39 with, or not in conflict with (e.g., placing restrictions on or asserting local government authority over federal law)
40 our proposed action, we do not find any inconsistency between the plans or laws and our actions taken in
41 accordance with the ESA. Similarly, to the extent that any of these plans or laws request action from the State of
42 Colorado or Colorado Congressional delegation that is not in conflict with our proposed action, we do not find
43 any inconsistency. However, to the extent that any of the documents above establish or include reference to

1 policies or ordinances prohibiting the import or release of certain wildlife, specifically gray wolves, the Service
2 cannot reconcile the proposed action of this EIS with those sections of local government policy statements, plans,
3 or ordinances that clearly contravene the nonessential experimental rule. However, the Service recognizes that
4 options to reduce or resolve conflict in specific instances may be available to the Service and the State of
5 Colorado by working with local governments to address safety concerns, select release sites, and provide
6 information to local communities. The Service also recognizes the interest held by local governments and
7 communities, including livestock permittees and private landowners, in the release and management of gray
8 wolves in Colorado west of the Continental Divide. To that end, collaboration with local entities as well as
9 communication with local communities will be incorporated in the development of this 10(j) rule.

10 Through the public scoping process, other state and local entities noted the presence of plans, including the State
11 of Utah, the State of New Mexico, the State of Arizona, Garfield County, and Moffatt County, and requested that
12 the Service consider conflicts with these plans. These entities are cooperating agencies in the EIS process, and
13 consistency with these planning documents will be considered throughout the planning process.

14 **4.9.4 Relationship Between Short-Term Uses of Man's Environment and the Maintenance and** 15 **Enhancement of Long-Term Productivity**

16 NEPA requires an analysis of the relationship between a project's short-term uses of the human environment and
17 the effects that this use may have on the maintenance and enhancement of long-term productivity (40 CFR
18 1502.6).

19 **No-Action Alternative**

20 Under the no-action alternative, no short- or long-term commitment of human resources would occur because no
21 regulatory framework would be put in place, and no resources would be needed to implement and manage that
22 framework. The introduction of the gray wolf to Colorado could result in protection of the long-term productivity
23 of the overall ecosystem and the sustainable use of resources, which is not a direct impact of the regulatory
24 framework, but is discussed in further detail under section 4.9.1, *Cumulative Impacts*.

25 **Alternatives 1 and 2**

26 Under the action alternatives, a short- and long-term commitment of human resources and short-term impacts
27 from time and resources require to implement a regulatory framework under the 10(j) rule to a whole or a portion
28 of the state of Colorado would occur. The introduction of the gray wolf to Colorado could result in protection of
29 the long-term productivity of the overall ecosystem and the sustainable use of resources, which is not a direct
30 impact of the regulatory framework, but is discussed in further detail under section 4.9.1, *Cumulative Impacts*.

31 The presence of gray wolves on federal lands would conform with federal agency land use and resource
32 management plans. On non-federal land, gray wolf presence would be managed through the allowable
33 management actions under the 10(j) rule, or in the case of alternative 2, the 10(a)(1)(A) permit in a smaller
34 portion of the state. With this action, the Service is not proposing to designate critical habitat, and it is not
35 expected that implementation of the action alternatives would change the character of the federal and non-federal
36 land use within the study area, its long-term productivity, or its availability for other beneficial uses.

37 The proposed action would provide a regulatory framework for the State-led reintroduction of the gray wolf to
38 provide management flexibility and provide for conservation of the species. The EIS analyzes the impacts of the
39 proposed take provisions. Although these alternatives may lead to different impacts across resource areas, the
40 relationship between short-term uses and long-term productivity would not be appreciably different from one
41 alternative to another. The potential for take provisions under either alternative would not alter the characteristic
42 uses of the land or resources in the project area. Short-term economic impacts may be sustained by individual
43 ranchers/livestock producers, but with the mitigations offered by the proposed regulatory framework, long-term
44 effects on overall livestock production in the study area are not expected. Similarly, localized, short-term impacts

1 to ungulates or the related economy of big game hunting from the action alternatives would not alter this
2 biological resource or economic sector over the long term because take provisions allow management actions if
3 State ungulate management goals are not being met. In conclusion, implementation of the action alternatives is
4 not expected to permanently narrow the range of beneficial uses of the human environment or adversely affect the
5 long-term productivity of the project area.

6 **4.9.5 Irreversible and Irrecoverable Commitment of Resources**

7 An irreversible and irretrievable commitment of resources refers to the use of those resources that would be
8 involved in the proposal should it be implemented (40 CFR 1502.16). Irreversible impacts are those that cause,
9 through direct or indirect effects, use or consumption of resources in such a way that they cannot be restored or
10 returned to their original condition despite mitigation. An irretrievable impact or commitment of resources occurs
11 when a resource is removed or consumed. The commitment of resources refers primarily to the use of
12 nonrenewable or depletable resources such as fossil fuels, water, labor, and electricity. Costs borne by the Service
13 associated with the proposed 10(j) regulation would include limited costs related to administrative oversight
14 related to permit issuance and/or annual review of memorandum of agreement if those tools are used.

15 **No-Action Alternative**

16 Under the no-action alternative, the absence of a regulatory framework to assist the State of Colorado in gray wolf
17 reintroduction efforts would not require the Service to put forth resources, and from that standpoint, would not
18 have an irreversible and irretrievable commitment of resources. However, under all alternatives, there could be
19 impacts to ungulates and livestock from the reintroduction of wolves. Without a regulatory framework to provide
20 mitigation for these losses in the form of management measures to deter wolves from depredation, these losses are
21 expected to be greater under the no-action alternative. While there would be a loss of ungulates and livestock, loss
22 of either is not an irreversible or irretrievable commitment of resources because both are abundant, renewable
23 resources.

24 **Alternatives 1 and 2**

25 The Service expects an incremental increase in costs over time from implementation of either action alternative as
26 the number and geographic distribution of gray wolves in the Colorado increases. Alternatives 1 and 2 provide for
27 a regulatory framework to address losses to livestock and impacts to ungulate populations related to the gray wolf
28 reintroduction. It is assumed that as wolf populations increase, the need to implement regulatory flexibility would
29 also increase. Over time, this would result in additional consumption of labor and nonrenewable use of
30 equipment, materials, supplies, and fuel.

31 Based on the above assessment of impacts to biological resources, Tribal resources, socioeconomics, and
32 environmental justice, the Service does not expect that implementation of either action alternative would result in
33 a significant irreversible or irretrievable commitment of resources. Some degree of adverse impact to wild prey
34 (primarily ungulates) and livestock due to the introduction of wolves is expected, but the action alternatives would
35 mitigate these impacts. While there would be a loss of ungulates and livestock, loss of either is not an irreversible
36 or irretrievable commitment of resources because both are abundant, renewable resources. Labor associated with
37 the implementation of proactive management to decrease the likelihood of livestock depredations may occur, or to
38 address the consequences of depredation (such as building additional fencing, or paperwork associated with
39 depredation claims); however, these impacts and commitments can be restored or returned to their prior condition
40 with mitigation such as successful implementation of proactive measures or receipt of depredation compensation.

41

42

CHAPTER 5 CONSULTATION AND COORDINATION

5.1 INTRODUCTION

NEPA requires federal agencies to make diligent efforts to involve other agencies and the public whenever possible (40 CFR 1506.6). This chapter provides a summary of the opportunities that have been made for public involvement, including government and non-government agencies or organizations in the development of this EIS.

5.2 PUBLIC INVOLVEMENT STRATEGY

The public involvement strategy for this EIS incorporated the following elements:

- **Public scoping.** The Service conducted a 30-day public scoping period through the publication of a notice of intent to prepare an EIS statement in the *Federal Register* on July 21, 2022 (87 FR 43489). Issues raised during public scoping are summarized in section 2.3 and Appendix B of this EIS.
- **Coordination and consultation.** The Service engaged with multiple federal and state agencies, Tribal governments, and local governments through the establishment of cooperating agency status, ongoing partner collaboration, and participation in Tribal working groups and Tribal coordination meetings.
 - Twenty-three entities were invited to serve as cooperating agencies, of which 19 confirmed participation via signature of a Memorandum of Understanding to participate in the development of an EIS. Cooperating agency meetings were held via virtual meetings on August 18, 23, and 31, 2022, and September 28, 2022. [As of September 28, 2022 – will be updated in subsequent drafts.]
 - Tribal governments were invited to request government-to-government consultation on the proposed rule and EIS with the Service via letters sent in July 2022 and followed up with phone and email communications. The Service presented at the Native American Fish and Wildlife Society Southwest Chapter Annual meeting in August 2022 and hosted a virtual informal meeting with Tribes from Arizona, Colorado, Oklahoma, New Mexico, and Utah on October 11, 2022.
 - The Service is in regular communication with federal agencies, and several are formal cooperating agencies including NPS, the Bureau of Land Management, U.S. Forest Service, and the USDA, Animal and Plant Health Inspection Service Wildlife Services. The Service was an active participant in the State of Colorado’s process to develop a state management plan including formal representation on the TWG and regular participation in the SAG throughout 2022.
- **Multi-media communication.** Communication with the stakeholders, cooperating agencies, Tribes, organizations, academics, and the general public was conducted in multiple formats, including email, Microsoft Teams video or Zoom web meetings, teleconferences, newspaper notices/advertisements, *Federal Register* notices, news releases, and websites. A website was developed for the public with information about the process and times, locations, and registration links for in-person and virtual public meetings.
- **Public meetings and information sessions.** In-person public information sessions and meetings were held during the 30-day public comment period on the notice of intent for the proposed 10(j) rule on August 2, 2022, August 3, 2022, and August 4, 2022; a virtual public information session and meeting was held on August 10, 2022.

1 **5.3 LIST OF RECIPIENTS OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT**

2 Upon publication of the notice of availability of the draft EIS in the *Federal Register*, a news release will be
3 provided to the media outlets who received the news release announcing the Notice of Intent in July of 2022.
4 Notice will be provided to media, interested individuals, and organizations via the Service’s standard
5 mailing/distribution lists, as well as the following:

- 6 ▪ The Service will use the lists generated from the public scoping.
- 7 ▪ The Service will use its news distribution service (Meltwater) to share the news release with instructions
8 on accessing the draft plan/EIS with local (Washington), regional and national media.
- 9 ▪ The Service will contact state and federal agency partners, Tribes, county commissioners, Congressional
10 members’ offices, state legislators, local non-governmental organizations, and other potential
11 stakeholders electronically with the news release, along with instructions on accessing the draft EIS.
- 12 ▪ The news release will be posted on the Service and CPW websites with links and information on
13 accessing the draft EIS.

CHAPTER 6 SUMMARY OF IMPACTS

1

2 Table 6-1 compares the potential environmental impacts of the alternatives. For a more detailed analysis of the
3 environmental impacts of each alternative, see Chapter 4 of the EIS.

4 Based on consideration of the purpose and need for the proposed action and the potential environmental impacts
5 of the alternatives, the Service has selected alternative 1, Apply Section 10(j) Rule to the Gray Wolf in Colorado,
6 as its preferred alternative.

1 **Table 6-1. Comparison of the Potential Environmental Impacts of the Alternatives**

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Biological Resources – Species of Special Concern – Wolves	Under the no-action alternative, wolves would remain listed as endangered, and take would be limited. The wolf population is expected to increase in size and distribution in areas where habitat suitability is high (i.e., sufficient wild prey and limited contact with humans).	Alternative 1 could have adverse environmental impacts to individual wolves through regulated take but is not expected to hinder recovery or have population-level effects in the long term. Alternative 1 would provide management flexibility, which would contribute in the long term to achieving statewide management objectives for wolves and other wildlife species.	Alternative 2 would provide added protection for wolves in the 10(a)(1)(A) permit area, which may lead to an increase in growth and distribution of the reintroduced wolf population in the short term. In the long term, the potential environmental impacts would be the same as under alternative 1 because of natural dispersal outside the 10(a)(1)(A) permit area.
Biological Resources – Other Species of Special Concern	The lack of flexibility for the management of reintroduced wolves could result in short- or long-term, adverse effects on prey species. The no-action alternative could also have long-term, adverse effects on the Mexican wolf if the ranges of both species expand and interbreeding occurs. However, adverse impacts to species of special concern are not likely because substantial population declines of species of special concern have not been documented as a result of previous wolf reintroductions elsewhere in North America.	Potential environmental impacts would be the same as those described under the no-action alternative because management flexibility for reintroduced wolves under alternative 1 would not include provisions for the take of wolves for the purposes of protecting or managing species of special concern. Therefore, alternative 1 could result in short- or long-term, adverse effects on some species of special concern.	Potential environmental impacts would be the same as under alternative 1.
Biological Resources – Other Wildlife	The lack of flexibility for the management of reintroduced wolves could result in short- or long-term, adverse impacts to prey populations because the State would not have the ability to manage wolves for the purposes of managing other wildlife populations for conservation.	Alternative 1 could have long-term, beneficial impacts on prey populations because if population levels decline below established State management goals as a result of wolf reintroduction, management flexibility, including nonlethal and/or lethal take, afforded to the State under alternative 1 would allow the State to take a limited number of wolves as a means to achieve its established goals for the statewide management of ungulate populations.	Potential environmental impacts under alternative 2 would be the same as under alternative 1 because the State would have the same amount of flexibility in its management of reintroduced wolves to achieve its management goals for ungulate populations.

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Cultural Resources – Tribal Cultural Resources	The State and Tribes would have limited management flexibility under this alternative to control the presence of wolves that may cause damage to archaeological and historical resources and that may inhibit the potential for Tribal access to these resources. The reintroduction of wolves could also affect natural resources of importance to Tribes in part due to competition resulting in changes to predation habits or habitat selection. The reintroduction of wolves could affect wildlife species that are hunted or used by the Tribes, such as elk, deer, and other ungulates. Elk and deer populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. These animals would be impacted over the long term because the State and Tribes would not have the flexibility to manage wolves to limit elk and deer population decline or facilitate recovery; the same could occur for pronghorn, wild sheep, bison, and moose.	Potential impacts to Tribal cultural resources would be similar to those described for the no-action alternative, although for some resources, potential impacts could be reduced due to the management flexibility available under the 10(j) rule and the potential for State and/or Tribal wolf management plan(s) to be developed in coordination with the Service.	Potential impacts to Tribal cultural resources would be similar to those described for alternative 1 due to the management flexibility. Slight differences may occur in Jackson County and western Larimer County.
Socioeconomic Resources	Due to the lack of management options under the no-action alternative, outdoor recreation, agriculture, and livestock producers would experience the most socioeconomic impacts. Lethal or nonlethal methods to address wolves if they reduce the population of ungulates below State management goals would not be available as a management tool. Outfitters and guides could experience long-term localized consequences from the lack of flexibility for take. A decline in hunting applications could lead to decreased wildlife revenue for CPW. Between \$7,078 and \$82,013 in livestock depredation losses could occur annually under the no-action alternative, which	Alternative 1 would result in long-term benefits for Colorado outdoor recreation outfitters and businesses compared to the no-action alternative. Under alternative 1, the State and Tribes would manage the reintroduction of wolves with the greatest degree of flexibility. Alternative 1 would result in fewer direct long-term costs to livestock producers. Implementation of alternative 1 may not fully offset indirect economic losses caused by livestock stress from wolf predation. Additionally, livestock producers could incur costs for implementing nonlethal take strategies.	The socioeconomic impacts under alternative 2 within the experimental population boundary would be the same as those described for alternative 1. The impacts for outfitters and guides would be similar to those described in the no-action alternative within the 10(a)(1)(A) permit area. Due to the limited options for implementing management, big game hunting demand may shift to wolf-free areas. Alternative 2 would allow for lethal and/or nonlethal take in most areas of the State, except for parts of Jackson County and western Larimer County, which would be subject to section 10(a)1(A). Under alternative 2,

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
	represents between 0.0002 percent to 0.0020 percent of the total value of cattle and sheep.		livestock producers within the section 10(a)(1)(A) permit boundary may face disproportionately higher direct and indirect costs from wolf depredation.
Environmental Justice	<p>Under the no-action alternative, if wolves are present within the Brunot Area lands or on Tribal reservations, localized impacts could be disproportionately high and adverse for Tribal members, particularly those who rely economically on livestock production or hunting and those who rely on subsistence hunting. This alternative could result in localized disproportionately high and adverse impacts to low-income and minority livestock producers and outfitters and guides, particularly in the focal counties due to the presence of suitable ecological conditions for gray wolves. Under this alternative, these impacts would not be mitigated because reintroduced gray wolves would be managed as an endangered species under the ESA.</p>	<p>Potential effects to Tribes would be mitigated by involving affected Tribes in planning processes to manage reintroduced wolves in accordance with the section 10(j) rule. Therefore, disproportionately high and adverse effects to Tribes are not expected under alternative 1.</p> <p>Disproportionately high and adverse impacts could occur on low-income outfitters and guides in local areas based on the factors discussed under the no-action alternative. Direct costs to livestock producers over the long term resulting from depredation would be lower under this alternative, compared to the no-action alternative.</p> <p>Implementation of alternative 1 may not fully mitigate against indirect economic losses or incurred costs to implement nonlethal take strategies. The potential for disproportionately high and adverse impacts would be reduced under alternative 1 compared to the no-action alternative.</p>	<p>Under alternative 2, potential impacts to population groups of concern would be the same as described under alternative 1 for areas within the proposed experimental population boundary, which would cover most of the state. Disproportionately high and adverse impacts to Tribes are not expected because the Service would work with affected Tribes to develop wolf management plans that would mitigate potential effects.</p> <p>While lethal take of wolves would be prohibited within the section 10(a)(1)(A) permit boundary, alternative 2 would still provide the State of Colorado flexibility to manage an existing population of gray wolves to meet State population goals for big game ungulate species. Impacts to outfitters and guides would be similar to impacts described under alternative 1. Within the section 10(a)(1)(A) permit boundary, impacts to low-income and minority livestock producers would be slightly reduced compared to the no-action alternative; however, these impacts may still be disproportionately high and adverse due to the cost of implementing nonlethal take measures.</p>

CHAPTER 7 LIST OF PREPARERS AND REFERENCES

7.1 LIST OF PREPARERS

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