

**FINAL ENVIRONMENTAL IMPACT STATEMENT
COLORADO GRAY WOLF 10(j) RULEMAKING**

Prepared for
U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

This 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 a gray wolf population that would be 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 Service has regulatory authority under the ESA to manage the conservation and recovery of federally listed threatened and endangered species, including the federally listed endangered gray wolf. This authority extends to creating rules and regulations and permitting legitimate activities that would otherwise be prohibited by federal law. Development of this 10(j) rule is considered a major federal action requiring review under the National Environmental Policy Act of 1969 (NEPA). This EIS has been prepared in accordance with NEPA and its implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508). The Service has prepared an EIS for this proposed action due to the level of public interest in the State Plan to reintroduce gray wolves to Colorado and the potential for public controversy.

The proposed section 10(j) rule would provide management flexibility to the Service and its designated agents for the reintroduction and management of the gray wolf (*Canis lupus*). The Service uses the term “gray wolf” to refer to *Canis lupus*, separate from the Mexican wolf (*Canis lupus baileyi*). The gray wolf and Mexican wolf are listed as separate entities under the ESA, and the term “gray wolf” as a listed entity encompasses several subspecies, with the exception of the Mexican wolf. Definitions of technical and regulatory terms used in this EIS are provided in Appendix A.

On November 3, 2020, Colorado voters approved Proposition 114 (codified as Colorado Revised Statute 33-2-105.8), a citizen-initiated ballot measure requiring the Colorado Parks and Wildlife (CPW) Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species' historical range in Colorado by December 31, 2023. As part of the reintroduction process, CPW requested the Service designate the gray wolf population that would be reintroduced to Colorado 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 respond to Colorado's request to designate the gray wolf population that would be reintroduced to Colorado as experimental under section 10(j) and to further the conservation of the species. This reintroduction effort is a result of Colorado Revised Statute 33-2-105.8, passed on November 3, 2020, which directs the CPW Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species' historical range in Colorado by December 31, 2023.

The need for this action is to provide management flexibility to the Service and its designated agents. 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 gray wolf population that would be reintroduced 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:

- **No-action alternative** – Under this alternative, the Service would not approve the 10(j) rule, and no management flexibility would be provided to the Service and its designated agents. Under the no-action alternative, the State of Colorado would still reintroduce the gray wolf on the Western Slope in accordance with Colorado Revised Statute 33-2-105.8.
- **Alternative 1** – Provide the Service and its designated agents management flexibility and provide for conservation of the species by approving a section 10(j) rule for the gray wolf population in Colorado, including any gray wolf living in, dispersing into, or reintroduced to the state.
- **Alternative 2** – Provide the Service and its designated agents management flexibility and provide for conservation of the species by approving a section 10(j) rule for the gray wolf population that would be reintroduced in a limited territory and issuing a permit under section 10(a)(1)(A) for an existing gray wolf population, should one become established, outside the designated experimental population boundary in the state.

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 State of Colorado could request to be approved as a designated agent of the Service under either alternative 1 or 2; therefore, these alternatives meet the purpose and need for the proposed action. The Service developed alternative 2 to manage gray wolves that would be reintroduced to Colorado 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 1.4 of the EIS. Pre-existing wolf populations include wolves living in the state and wolves that naturally have dispersed into the state before finalization of the section 10(j) rule and meet the definition of a population. The no-action alternative is included in compliance with Council on Environmental Quality regulations implementing NEPA (40 CFR 1502.14[c]). The no-action alternative considers implementation of the State 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.

The Service has identified alternative 1 as the Preferred Alternative for implementing the proposed action. Alternative 1 would provide a consistent federal regulatory framework and take provisions across the state for managing gray wolves that would be reintroduced and gray wolves living in or naturally dispersing to Colorado. This alternative would provide the management flexibility requested by the State of Colorado within the experimental population boundary, which would include the entire state. Management flexibility would be provided statewide because, although gray wolves would be reintroduced on the Western Slope in accordance with Colorado Revised Statute 33-2-105.8, wolves can disperse long distances and may eventually occur throughout the state. See section 2.4.2 for additional detail on alternative 1.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

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

Table ES-1. Comparison of Alternatives

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Regulatory Management Framework Used	All ESA protections apply.	Section 10(j) throughout entire state of Colorado	If an existing population is documented before a section 10(j) rule is finalized, the State could apply for a permit, and the Service could issue the State a section 10(a)(1)(A) permit in the portion(s) of Colorado in which an existing population (as defined by the Service) is located, if discovered. For analysis purposes, this alternative is based on the following State of Colorado Big Game Management units: 161, 6, 7, 16, 17, and 171, which occur in Jackson County and the western part of Larimer County (see figure 2-2). An experimental population boundary would be established for the remainder of the state outside this area that would be wholly separate geographically from the existing population.
Listed status of wolves	Endangered	Threatened	Threatened within the experimental population boundary. Endangered in area covered under the section 10(a)(1)(A) permit.
Consultation (per section 7)	Federal agencies are required to consult with the Service for any project or action they authorize, fund, or carry out that 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 (16 USC §1539(j)(2)(C)(i)).	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(j)(2)(C)(i)). 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
Opportunistic harassment	May be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).	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.	Within the experimental population boundary, 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. Within the 10(a)(1)(A) permit area, opportunistic harassment may be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).
Intentional harassment	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. Intentional harassment must be reported to the Service or a designated agent within seven days.	Within the experimental population boundary, 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 private land	No lethal or injurious nonlethal take would be permitted.	Consistent with state or Tribal requirements, any landowner may take a gray wolf in the act of attacking livestock or working dogs on private land, provided the landowner provides evidence of livestock, stock animals, or working 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 working 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	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
		evidence that the take was conducted according to this rule.	
Taking of wolves "in the act" of depredation on public land	No lethal or injurious nonlethal take would be permitted.	Consistent with state or Tribal requirements, any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may take a gray wolf in the act of attacking livestock or working dogs legally present on public lands without prior written authorization. The Service or designated agent(s) must be able to confirm the livestock or working 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. Any person legally present on public land may immediately take a wolf that is in the act of attacking the individual's stock animal or working dog, provided conditions noted in "taking of wolves in the act on private land" are met. Any take or method of take on public lands must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	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
Additional taking by private citizens on private land	No lethal or injurious nonlethal take would be permitted.	At the Service's or designated agents' direction, the Service or designated agent may issue a repeated depredation written take authorization of limited duration (45 days or less) to a landowner or their employees to take up to a specified (by the Service or designated agent) number of wolves on their private land if: (1) the landowner has had at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent within the last 30 days; and (2) the Service or designated agent has determined that repeatedly depredating wolves are routinely present on the private land and present a significant risk to the health and safety of livestock; and (3) the Service or designated agent has authorized lethal removal of wolves from that same private land. These authorizations may be terminated at any time once threats have been resolved or minimized. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	Within the experimental population boundary, issuance of repeated depredation written take authorization for repeatedly depredating 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
Additional taking by grazing permittees on public land	No lethal or injurious nonlethal take would be permitted.	At the Service's or designated agent(s) direction, the Service or designated agent(s) may issue a repeated depredation written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take repeatedly depredating 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 repeatedly depredating 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 repeatedly depredating wolves from that same allotment. These authorizations may be terminated at any time once threats have been resolved or minimized. Any take or method of take on public land must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	Within the 10(j) boundary, issuance of repeated depredation written take authorization for repeatedly depredating 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
Agency take of wolves that repeatedly depredate livestock	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 repeatedly depredating wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, working dogs, or other domestic animals, or remains of livestock, working 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, working dogs, or other domestic animals; (2) the likelihood 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, 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	Incidental take could be permitted or exempted under other ESA authorities.	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 designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited). Shooting a wolf as a result of mistaking it for another species is not considered accidental and may be referred to the appropriate authorities for prosecution.	Within the experimental population boundary, same as alternative 1. Within the 10(a)(1)(A) permit area, same as the no-action alternative.

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Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Additional taking provisions for agency employees	No lethal or injurious nonlethal take would be permitted.	Any employee or agent of the Service may take a wolf from the wild if such action is (1) for take related to the release, tracking, monitoring, recapture, and management for the experimental population; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to dispose of a dead specimen; (4) to salvage a dead specimen that may be used for scientific study; (5) to aid in law enforcement investigations involving wolves; or (6) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.	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 take related to the release, tracking, monitoring, recapture, and management for the experimental population; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to dispose of a dead specimen; (4) to salvage a dead specimen that may be used for scientific study; (5) to aid in law enforcement investigations involving wolves; or (6) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.
Tribal take to reduce impacts on wild ungulates	No lethal or injurious nonlethal take would be permitted.	The Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and	Within the experimental population boundary, the Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted

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	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		<p>are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the proposal must be used to review the proposal. Upon Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.</p>	<p>to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the proposal must be used to review the proposal. Upon Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted. Only nonlethal take would be allowed.</p>

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 regulated take would be limited to instances where wolves pose a threat to human life or safety. 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.	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 (Including Other Federally Listed and State-listed Species)	No flexibility for the management of reintroduced wolves for the purposes of conserving other species of special concern, potentially resulting in short- or long-term, adverse effects on prey species. 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. Like under the no-action alternative, alternative 1 is not likely to result in adverse effects on species of special concern.	Potential environmental impacts would be the same as under alternative 1.
Biological Resources – Other Wildlife (Elk, Deer, and Other Ungulates)	No flexibility for the management of reintroduced wolves for the purposes of managing other wildlife populations for conservation, potentially resulting in short- or long-term, adverse impacts to prey populations.	Potential impacts to prey populations would be similar to those described under the no-action alternative because management flexibility for reintroduced wolves for the purposes of managing ungulate populations would be limited to reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado. Because these lands make up a relatively small portion of the state's geographic area, potential take of wolves for the management of ungulates on reservations lands is not likely to	Potential impacts to prey populations would be the same as under alternative 1.

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		result in measurable effects on statewide elk and deer populations.	
Cultural Resources – Tribal Cultural Resources	<p>Under this alternative, damage to archaeological and historical resources may occur in locations where the presence of wolves coincides with these resources. For instance, denning activities may damage surface or subsurface resources if these locations are used by wolves, and the presence of wolves may inhibit the potential for Tribal access to these resources.</p> <p>The reintroduction of wolves could also affect natural resources (e.g., wildlife) of importance to Tribes in part due to competition resulting in changes to predation habits or habitat selection.</p> <p>The reintroduction of wolves could affect wildlife species that are hunted or used by the Tribes, such as elk, deer, and other ungulates. Elk, deer, and other ungulate populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. These animals could be impacted over the long term.</p>	<p>Potential impacts to Tribal cultural resources would be similar to those described for the no-action alternative, although for some resources, including livestock, potential impacts could be reduced due to the management flexibility available under the 10(j) rule. Under alternative 1, the Southern Ute Indian Tribe and Ute Mountain Ute Tribe would have the ability to take wolves if populations of big game ungulates decline below established Tribal management goals as a result of wolf reintroduction. Therefore, alternative 1 could have a beneficial impact on ungulate populations on reservation lands over the long term, compared to the no-action alternative.</p>	<p>Potential impacts to Tribal cultural resources would be similar to those described for alternative 1 due to the management flexibility that would be provided by the section 10(j) rule. If an existing population were identified within a reservation, lethal take of wolves would be prohibited within the section 10(a)(1)(A) permit boundary. Alternative 2 would still provide the designated agents, including Tribes, flexibility to manage an existing population of gray wolves to mitigate impacts to livestock. The Southern Ute Indian Tribe and Ute Mountain Ute Tribe also would have the management flexibility to address decreases in ungulate populations below Tribal goals on reservation lands within the experimental population boundary, which could reduce impacts to wildlife species that are hunted by the Tribes.</p>

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
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 Tribal management objectives would not be available as a management tool. Outfitters and guides could experience long-term localized consequences from decreases in ungulate populations, altered movement patterns of herds, or shifted demand for hunting to other parts of the state. A decline in hunting applications could lead to decreased wildlife revenue for CPW.</p> <p>An estimated 103–916 cattle and 35–395 sheep statewide, and 29–256 cattle and 15–164 sheep in the 21 focal counties could be killed or injured assuming a population of 200 wolves. This would result in estimated inflation-adjusted loss of up to \$1,607,573.59 in the statewide study area and up to \$365,013.13 in the 21 focal counties annually under the no-action alternative, which represents 0.0315 percent (Colorado) and 0.0071 percent (21 focal counties) of the total market value of cattle and sheep in Colorado.</p>	<p>Under alternative 1, impacts to outdoor recreation outfitters would be similar to those under the no-action alternative under the rule as written. Because there would be no statewide provision to address the management of wolves to address ungulate impacts on Colorado recreation outfitters, impacts would be the same as under the no-action alternative—long term, localized, and adverse. Implementation of the ungulate provision on Southern Ute and Ute Mountain Ute reservation lands could mitigate adverse economic effects to Tribes and outfitters by maintaining ungulate populations at a higher level than under the no-action alternative. Under alternative 1, the Service and its designated agents 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 areas without gray wolves. Alternative 2 would allow for lethal and/or nonlethal take under the provisions of the section 10(j) rule in most areas of the state, except for Jackson County and western Larimer County, which would be subject to a section 10(a)(1)(A) permit (see table ES-1). 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
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>Disproportionately high and adverse impacts could occur on low-income outfitters and guides, subsistence hunters, and Tribes in local areas across most of the state based on the factors discussed under the no-action alternative. Implementation of the ungulate provision on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands could have a long-term, beneficial impact on big game ungulate species by mitigating the potential for ungulate populations to decline below Tribal management objectives. 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. However, 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.</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 Service and its designated agents flexibility to manage an existing population of gray wolves to address livestock depredation. 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. Impacts to outfitters and guides and subsistence hunters would be similar to impacts described under alternative 1.</p>

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ACRONYMS AND ABBREVIATIONS

CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CPW	Colorado Parks and Wildlife
CRS	Colorado Revised Statute
EIS	environmental impact statement
ESA	Endangered Species Act
FR	Federal Register
MWEPA	Mexican Wolf Experimental Population Area
NEPA	National Environmental Policy Act
NPS	National Park Service
NRM DPS	Northern Rocky Mountains Distinct Population Segment
OAHP	(Colorado) Office of Archaeological and Historic Preservation
OHV	off-highway vehicle
SAG	(Colorado Wolf Management Plan) Stakeholder Advisory Group
Service	U.S. Fish and Wildlife Service
SGCN	Species of Greatest Conservation Need
State Plan	Colorado Wolf Restoration and Management Plan
SWAP	(Colorado's) State Wildlife Action Plan
TWG	(Colorado Wolf Management Plan) Technical Working Group
USC	United States Code
USDA	United States Department of Agriculture
USEPA	U.S. Environmental Protection Agency
WTGMA	Wolf Trophy Game Management Area

CHAPTER 1 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

Commented [DT2]: cursory examination of intro purpose and needs sections

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 the gray wolf population that would be reintroduced to Colorado as experimental 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 Service and its designated agents for the reintroduction and management of the gray wolf (*Canis lupus*). The Service uses the term “gray wolf” to refer to *Canis lupus*, separate from the Mexican wolf (*Canis lupus baileyi*). The gray wolf and Mexican wolf are listed as separate entities under the ESA, and the term “gray wolf” as a listed entity encompasses several subspecies, with the exception of the Mexican wolf. 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 Revised Statute [CRS] 33-2-105.8), a citizen-initiated ballot measure requiring the Colorado Parks and Wildlife (CPW) Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species’ historical range in Colorado by December 31, 2023. As part of the reintroduction process, CPW has requested the Service designate the gray wolf population that would be reintroduced 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. Definitions of technical and regulatory terms used in this EIS are provided in Appendix A.

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). The Service has prepared an EIS, rather than an environmental assessment, for this proposed action due to the level of public interest in the State Plan to reintroduce gray wolves to Colorado and the potential for public controversy. Appendix B 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 the gray wolf population that would be 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 respond to the State of Colorado’s request to designate the gray wolf population that would be reintroduced to Colorado as an experimental population under section 10(j) and to further the conservation of the species. This reintroduction effort is a result of CRS 33-2-105.8, passed on November 3, 2020, which directs the CPW Commission to take the steps necessary to begin

reintroductions of gray wolves to a portion of the species' historical range in Colorado by December 31, 2023.

1.3 NEED FOR THE ACTION

The need for this action is to provide management flexibility to the Service and its designated agents. 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 gray wolf population that would be reintroduced 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 canadensis*), 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 natural 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 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 United States 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. Wolves in the northern Rocky Mountain region were most recently delisted in 2012 (76 FR 25590, May 5, 2011) and 2017 (82 FR 20284, May 1, 2017).

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

After wolf reintroduction in the northern Rocky Mountains, unconfirmed wolf sightings became more common in Colorado. However, the first confirmed wolf in Colorado in modern times was struck and killed by a vehicle near Idaho Springs in 2004. Although four additional lone wolves have been confirmed in Colorado since 2004, no resident groups were documented in the state until 2020. In January 2020, CPW field personnel followed up on sighting reports from the public and confirmed at least six wolves traveling together in extreme northwest Colorado. This group was down to a single individual later that year and, at present, there is no indication that any wolf or wolves remain in the northwest corner of the state. Separately, in north-central Colorado, an individual wolf from Wyoming was first documented during summer 2019 and paired up with another wolf during winter 2020–2021. This pair produced offspring in spring 2021, becoming the first documented reproductively active group in Colorado in recent history. As of December 31, 2022, this group contains the only known wolves in the state and is composed of two individuals (Odell 2023).

The Service defines a wolf population as “at least two breeding pairs of wild wolves successfully raising at least two young each year (until December 31 of the year of their birth), for two consecutive years” (USFWS 1994). Only one breeding pair had been identified in Colorado as of 2021, and no reproduction was documented in the spring of 2022 or spring of 2023; therefore, these two criteria have not been met. According to this definition, no gray wolf populations have been documented in the state.

As noted above, on November 3, 2020, Colorado voters approved Proposition 114, a citizen-initiated ballot measure requiring the CPW Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species’ historical range in Colorado by December 31, 2023. The CPW Commission released the Final Wolf Restoration and Management Plan on May 3, 2023 (referred to here as the State Plan; CPW 2023a). Details of the State Plan are incorporated into the action alternatives discussed in Chapter 2 of this EIS and assessed in Chapter 4, Environmental Consequences.

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

1.5 PROJECT LOCATION AND DESCRIPTION

CPW is planning to reintroduce gray wolves to a portion of the species' historical range in the state of Colorado. Historically, gray wolves occurred across Colorado in all the state's major habitat types. Potential reintroduction sites are discussed in the State Plan. However, the study area for this analysis includes the entire state of Colorado, or the area in which the federal regulatory framework that would be implemented under alternatives 1 or 2 would apply.

1.6 PLANNING AND EIS PROCESS

The Service prepared this EIS to evaluate the impacts of the proposed action on the human environment, consistent with the purpose and goals of NEPA (42 USC 4321 et seq.) and pursuant to the Council on Environmental Quality's (CEQ) implementing NEPA regulations at 40 CFR Parts 1500–1508 (as amended). Additionally, the EIS was prepared consistent with the Department of the Interior's NEPA regulations (43 CFR Part 46), long-standing federal judicial and regulatory interpretations, and Administration priorities and policies including Secretary's Order No. 3399 requiring bureaus and offices to use "the same application or level of NEPA that would have been applied to a proposed action before the 2020 Rule went into effect."

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

1.6.1 Scope of the EIS

This EIS evaluates the potential environmental effects of the Service's proposed action to address the State of Colorado's request to issue a section 10(j) rule, consistent with section 10 of the ESA, to provide management flexibility for the Service and its designated agents in reintroducing and managing a population of gray wolves in a portion of the species' historical range, while still providing for conservation of the species. The reintroduction effort is directed by CRS 33-2-105.8, which requires the CPW Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species' historical range in Colorado by December 31, 2023. The State may reintroduce wolves with or without further action by the Service, in compliance with the State's cooperative agreement under

section 6 of the ESA; therefore, considering an alternative to not pursue active wolf reintroduction efforts is outside the Service's legal authority and outside the scope of the EIS.

Furthermore, the State of Colorado has developed a wolf restoration and management plan and will be the agency leading gray wolf reintroduction efforts in the state. As such, elements directly related to the reintroduction of wolves, such as how many wolves would be released, where they would be released, and population objectives are outside the scope of the EIS. The proposed section 10(j) rule would address the potential for take resulting from State-led activities associated with reintroduction and management of gray wolves in Colorado. These activities are described in the State Plan (CPW 2023a). Reintroduction and management of gray wolves in Colorado is not an identified priority of the Service's previous national wolf strategy outlined above; therefore, the Service is not proposing any additional management measures for the gray wolf population that would be reintroduced by the State of Colorado.

Commented [DT3]: Important statement

1.6.2 Public Participation – Scoping and Draft EIS Public Review

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

A second opportunity for public review occurred with the release of the proposed rule and draft EIS, which were made available to the public for a 60-day review period from February 17, to April 18, 2023. During this time, three in-person public meetings were held on the Western Slope of Colorado (March 14-16, 2023), one meeting was held in Lakewood, Colorado (March 28, 2023), and a virtual meeting was held on March 22, 2023. Responses to public comments on the proposed rule and draft EIS are provided in Appendix D. In general, comments received during review of the draft EIS included many of the same issues as scoping, including the range of alternatives, NEPA sufficiency, and potential impacts to people and businesses. The comments also included feedback on the proposed rule including suggestions for changing definitions of terms, allowable take, and reporting requirements.

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, in accordance with regulations implementing NEPA at 40 CFR 1502.14.

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 gray wolf reintroduction and management efforts. In response to this request, the Service is proposing to promulgate a section 10(j) rule, consistent with section 10 of the ESA, to provide management flexibility for the reintroduction and management of a population of gray wolves in Colorado. The Service would establish this framework in the fall of 2023 to meet the deadline established in CRS 33-2-105.8, which requires the CPW Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species' historical range by December 31, 2023. The section 10(j) rule would remain in place unless the species is federally delisted.

The Service has identified alternative 1 as the Preferred Alternative for implementing the proposed action. Alternative 1 would provide a consistent federal regulatory framework and take provisions across the state for managing gray wolves that would be reintroduced and gray wolves living in or naturally dispersing to Colorado. This alternative would provide management flexibility within the experimental population boundary, which would include the entire state. Management flexibility would be provided statewide because, although gray wolves would be reintroduced on the Western Slope in accordance with Colorado Revised Statute 33-2-105.8, wolves can disperse long distances and may eventually occur throughout the state. See section 2.4.2 for additional detail on alternative 1.

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 and public review of the draft EIS.

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 met monthly beginning in June 2021 to provide recommendations to CPW during plan development. 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 on December 9, 2022, and the final State Plan, released on May 3, 2023.

Participants in the public scoping and draft EIS review processes 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 C). The Service considered all proposed alternatives identified during public scoping and review of the draft EIS, 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:

- **No-action alternative** – Under this alternative, the Service would not approve the 10(j) rule, and no management flexibility would be provided to the Service and its designated agents. Under the no-action alternative, the State of Colorado would still reintroduce the gray wolf on the Western Slope in accordance with Colorado Revised Statute 33-2-105.8.
- **Alternative 1** – Provide the Service and its designated agents management flexibility and provide for conservation of the species by promulgating a section 10(j) rule for the gray wolf population in Colorado, including any gray wolf living in, dispersing into, or reintroduced to the state.
- **Alternative 2** – Provide the Service and its designated agents management flexibility and provide for conservation of the species by promulgating a section 10(j) rule for the gray wolf population that would be reintroduced in a limited territory and issuing a permit under section 10(a)(1)(A) for an existing gray wolf population, should one become established prior to finalization of the section 10(j) rule. The 10(j) rule would exclude the area occupied by an existing population of wolves from the section 10(j) boundary.

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 State of Colorado could request to be approved as a designated agent of the Service under either alternative 1 or 2; therefore, these alternatives meet the purpose and need for the proposed action. The Service developed alternative 2 as an alternative for managing the gray wolf population that would be reintroduced and any established, pre-existing wolf populations in the state (should one be identified prior to finalization of the section 10(j) rule proposed under alternative 1) consistent with section 10 of the ESA. The term “population” is defined in section 1.4. Pre-existing wolf populations include wolves living in the state and wolves that naturally have dispersed into the state before finalization of the section 10(j) rule and meet the definition of a population.

The no-action alternative, is included in compliance with CEQ regulations implementing NEPA (40 CFR 1502.14(c)). The no-action alternative considers implementation of the State Plan subject to sections 6 and 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. Detailed descriptions of the alternatives evaluated in the EIS are discussed below.

2.3.3 Alternatives Identified During Scoping and Review of the Draft EIS, but Not Evaluated Further

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

1. **Apply a Section 10(j) Rule to a Smaller Geographic Area (Experimental Population Boundary)** – The Service considered evaluating an alternative to establish a smaller experimental population boundary in Colorado. However, this alternative is not evaluated further because it may pose undue restrictions on the ability of CPW to provide adequate habitat for gray wolves as their population within the state grows or to manage wolves that disperse outside the experimental population area to other parts of the state.
2. **Apply a Section 10(j) Rule to a Larger Geographic Area (Experimental Population Boundary)** – Commenters suggested that the experimental population boundary be expanded to include a buffer zone around Colorado’s state borders to prevent unregulated take where wolves lack ESA protection, such as in Wyoming. Special management provisions are only applicable within the experimental population boundary where an ESA-listed species is present. If the gray wolf is not federally listed as endangered in a state, designation of a section 10(j) rule and creation of an experimental population boundary is not applicable, and these regulatory tools would not change the designation of wolves in that state to offer more protection. Furthermore, a section 10(j) rule and experimental population boundary cannot be applied in areas where existing populations of a species are present. Colorado coordinated with adjoining states during the State’s planning process for reintroduction, and these states did not express a desire to be included in the section 10(j) designation. For these reasons, this element was not carried forward for analysis.
3. **Establish a Candidate Conservation Agreement or Other Cooperative Agreement** – Establishing a Candidate Conservation Agreement or other cooperative agreement with the State was not evaluated further in the EIS because these agreements only apply to non-listed species. The gray wolf would need to be delisted under the ESA for these agreements to apply, which is outside the scope of the proposed action.
4. **No Wolf Reintroduction** – The Service considered an alternative under which the gray wolf would not be intentionally reintroduced by the State of Colorado. The recovery of the gray wolf in the state would rely on natural recolonization and population growth, and the Service would continue to manage the species as endangered under the ESA. However, this alternative is outside the Service’s legal authority. The CPW Commission is required to comply with Colorado Revised Statute 33-2-105.8 and take the steps necessary to begin reintroductions of gray wolves to a portion of the species’ historical range in Colorado by December 31, 2023. Therefore, each of the alternatives evaluated in the EIS assumes that the planned reintroduction and management of gray wolves will move forward, led by the State of Colorado.
5. **Variations on Statewide Permits Issued by the Service** – During public scoping, commenters suggested variations on Statewide permits such as developing a section 10(a)(1)(A) permit for the entire state, a section 10(a)(1)(B) permit for the entire state, or a section 10(j) rule with no lethal take. Part of the purpose of this effort is to provide management flexibility for the reintroduction process. Use of a section 10(a)(1)(A) permit would not provide for full management flexibility because the permit would not allow for lethal take statewide. The Service has previously included purposeful, lethal take in a 10(a)(1)(A) permit, which the courts later invalidated (*Humane Society of U.S. v. Kempthorne*, 481 F. Supp. 2d 53 (D.D.C. 2006), *vacated sub nom. Humane Soc. of U.S. v. Kempthorne*, 527 F.3d 181 (D.C. Cir. 2008)).

The Service considered the use of all regulatory frameworks, including the 10(a)(1)(B) permit; however, this permitting tool is not used for recovery actions, such as the gray wolf reintroduction. The section 10(a)(1)(B) permit is issued at the conclusion of the Habitat

Conservation Plan process as a mechanism to permit incidental take of a species, not intentional take; therefore, this is not an appropriate regulatory mechanism to consider for this effort.

In regard to considering a section 10(j) rule with no lethal take permitted, this management approach would best be accomplished through a different regulatory framework, such as a Safe Harbor Agreement. The section 10(j) rulemaking process is most effective when it provides a range of management flexibility, including lethal take; therefore, the Service did not consider a scenario with a section 10(j) rule and no lethal take. Establishing a Safe Harbor Agreement would not meet the purpose and need for the proposed action because it would limit management flexibility throughout the state; therefore, this regulatory mechanism was not considered.

6. **Alternative Elements Related to Wolf Release, Management, Compensation, and Education** – Commenters provided suggestions on where wolves should be reintroduced, the use of radio collars to track wolves, how many wolves should be introduced, providing a compensation program for livestock producers, providing various education programs on conflict reduction, the ecological importance of wolves, relocation of wolves that leave specific geographic areas, and management tools for livestock producers to address wolves. All of these elements are directly related to the reintroduction of the gray wolf, rather than the development of a regulatory framework, and are not within the scope of this EIS. These elements were addressed in the State Plan that was approved by the CPW Commission in May 2023.

The relocation of gray wolves to reduce conflicts in neighboring states, including the relocation of gray wolves to mitigate potential impacts on the Mexican wolf population and recovery of that population, would be addressed by separate permits issued by the Service to the State of Colorado and other designated agents, and not under the 10(j) rule. See section 4.9.2 for a description of permitting approaches that would be used to mitigate potential impacts on the Mexican wolf.

7. **Population Goals or Thresholds** – Commenters suggested various ways to implement population goals and/or thresholds, including allowing for 1,000 wolves on the landscape, creating a limit on lethal control actions if wolf populations are not meeting certain goals, implementing ecosystem recovery targets as an indicator of wolf recovery, and setting population goals and timelines for the delisting of the gray wolf. The determination of how many wolves would be released per year and the goals for total numbers of wolves are outside the scope of the Service's effort, which is focused solely on the section 10(j) rulemaking process. These issues are addressed in the State Plan. Additionally, the Service has not developed a recovery plan or recovery criteria for the gray wolf in Colorado. Setting recovery criteria related to the federal delisting of the gray wolf is a planning effort that is outside the scope of this section 10(j) rulemaking.
8. **Mexican Wolf Interactions/Management** – Commenters provided a variety of comments related to the Mexican wolf, including keeping the two populations of wolves separate, allowing them to intermingle, and reintroducing a subpopulation of the Mexican wolf to Colorado. Issues related to gray wolf and Mexican wolf interactions are addressed in the EIS under section 4.4, Species of Special Concern, and section 4.9, Cumulative Impacts and Other Considerations. The Service recognizes the potential for interactions between the two species, and managing these interactions would occur in coordination with the Mexican Wolf Recovery Program. The specific suggestion of including reintroduction of the Mexican wolf under the section 10(j) rulemaking is outside the scope of analysis. Reintroduction of the Mexican wolf is considered and disregarded as an alternative under the State Plan in the final report prepared by the Colorado Wolf Management Plan TWG (TWG 2021). Colorado is planning to reintroduce the gray wolf, and this

10(j) process is considering the regulatory framework for managing gray wolves that would be reintroduced to Colorado, rather than the Service reintroducing the species.

9. **Use of Trapping and Foothold Traps** – Commenters requested that the section 10(j) rule allow for the trapping of gray wolves and the use of foothold traps. The Service considered this element in the planning process since it has been used in other section 10(j) regulations for species reintroductions. However, State policy only allows for the use of foothold traps for scientific investigations. Should State policy change, the range of alternatives considered in the EIS does not include anything that dictates what tools can or cannot be used, and the State would be able to use foothold traps as a management tool should it choose to do so. Therefore, this element was not specifically included in the range of alternatives.
10. **Reproductive Control** – Commenters suggested that reintroduced wolves should be spayed and neutered because the population is experimental. Because the gray wolf is listed under the ESA as an endangered species, reproductive control would be contrary to the goals of the ESA and the mission of the Service with regard to promoting the recovery of listed species; therefore, this element was not considered in the range of alternatives.
11. **Lethal Take of all Gray Wolves Prior to the Population Being Deemed Essential** – Commenters suggested that the rule include an “escape clause” that would allow the Service to lethally take all wolves in the experimental population if the nonessential status were to become at risk. However, the gray wolf is listed under the ESA as an endangered species; therefore, lethal take for this purpose would not be consistent with the ESA, the mission of the Service, or recovery goals for the species and was not considered as an alternative element. Once an experimental population is designated as essential or nonessential, there is no regulatory mechanism to change the essential/nonessential designation.
12. **Public Land Management** – Commenters suggested various ways to manage public lands to address conflicts with wolves, including removing all livestock from public lands and forbidding lethal take on public lands. The removal of grazing/livestock leases on federal lands is not within the jurisdiction of the Service, and instead, falls to other agencies such as the Bureau of Land Management and U.S. Forest Service. Lethal take on public lands would occur within the same regulatory framework and same restrictions as lethal take on state and private lands.
13. **Include an Ungulate Provision in the Rule that Applies Statewide** – The draft EIS evaluated a statewide provision to address potential gray wolf impacts on ungulate populations; however, the final rule and EIS only include such a provision on reservation lands of the Ute Mountain Ute Tribe and Southern Ute Indian Tribe, as designated agents of the Service. Adding this provision only on these lands recognizes the sovereignty of these Tribal nations.
14. **Only Allow for Nonlethal Management Measures for the Gray Wolf** – The Service considers it important to retain the ability to remove wolves in specific situations in which nonlethal management actions are ineffective at resolving conflicts. The effectiveness of nonlethal deterrents depends on various characteristics of the area and individual livestock operations. For instance, many tools (fladry [i.e., a nonlethal tool designed to protect livestock from predation by creating a visual barrier to wolves], radioactivated guard boxes, and electric fencing) are only effective in small areas. Nevertheless, some innovative tools (range riding, hazing) have reduced wolf depredations in certain situations. The Service would continue to focus on and expand the use of nonlethal tools where appropriate, but felt it would not meet the purpose and need for the

Commented [DT4]: Curious why this occurred? This seems odd that it would be allowed on tribal lands but not elsewhere, I realize the importance of recognizing sovereignty, but question why the impacts on ungulates would be different on tribal versus any other lands, the wolves are not differentiation prey availability and selection based on land status?

proposed action to have an alternative that relied solely on nonlethal management measures. The rule limits lethal removal at the agency's discretion.

15. **Additional Requirements for Allowing Take** – Commenters suggested a number of conditions that should be met before take is permitted, including requiring four or more livestock losses on private land by a single wolf within seven days to lethally take the wolf; including the presence of carrion or unusual odors; verifying that the livestock operator implemented at least two area-specific conflict minimization techniques; verifying that further nonlethal prevention would not be effective and that lethal take of the wolf would not harm the wolf population and State recovery objectives; requiring more than one depredation event to occur before lethal take is permitted; and allowing only the Service and its designated agents the authority to legally take wolves. The Service believes the take allowances are already limited and including additional requirements on the use of lethal take would provide additional barriers that would reduce the effectiveness of the rule and would not provide the management flexibility the rule was developed to provide. Regarding who has the authority for legal take, some conflicts are likely to occur on private property or in remote and difficult to reach locations, making timely responses by the Service or designated agent personnel difficult. Authorizing take for livestock operators and landowners under strictly defined circumstances would help to minimize conflict when landowners are the closest responders. It would also meet the purpose of the 10(j) rule in conserving the species while reducing the regulatory burden; therefore, these elements were not included in the range of alternatives evaluated.

2.4 ALTERNATIVES CONSIDERED IN DETAIL IN THE ENVIRONMENTAL ANALYSIS

The no-action alternative and the two action alternatives are described below. A comparison of the alternatives is provided after the description of the alternatives in table 2-4. Under each of the alternatives, the provisions of the ESA would remain in effect, except as provided by the proposed rule under alternatives 1 and 2. Under each alternative, except as provided by the proposed rule, permits would be available and required for handling, transporting, or otherwise managing gray wolves for scientific purposes, enhancement of propagation or survival, educational purposes, or other purposes consistent with the ESA (50 CFR 17.32).

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

The State Plan would direct the population goals and management of gray wolves in Colorado. Initial planning indicates that the State intends to release 10 to 15 wolves per year, for 3 to 5 years. According to the State Plan, "the total number of wolves relocated in any year and in total will depend on capture success, continued participation by cooperating states, and the degree to which relocated animals remain in Colorado and survive" (CPW 2023a). The State has identified target thresholds of either (1) a minimum count of 150 wolves anywhere in Colorado for two successive years, or (2) a minimum count

of 200 wolves anywhere in Colorado with no temporal requirement, which must be met before the species would be delisted from the State's list of threatened and endangered species and managed as a delisted, nongame species (CPW 2023a). If the gray wolf is delisted by the State but remains federally listed under the ESA, the provisions of the implemented federal regulatory framework (10(j) rule) would remain in effect.

2.4.1 No-Action Alternative

Background

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

Summary

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

Detailed Description

Under the no-action alternative, in compliance with Colorado Revised Statute 33-2-105.8, the CPW Commission would still take the steps necessary to begin reintroductions of gray wolves by December 31, 2023, but gray wolves would be reintroduced as a federally endangered species. Under the no-action alternative, the State of Colorado would be able to reintroduce a population of gray wolves without authorization from the Service. The State may capture gray wolves from the federally delisted population in the northern Rocky Mountains region (i.e., Idaho; Montana; Wyoming, or parts of Washington, Oregon, or north-central Utah) to be reintroduced to Colorado. Federally delisted populations are managed under state laws and regulations and not under the authority of the ESA. Additionally, the State of Colorado is authorized under its cooperative agreement with the Service, pursuant to section 6(c) of the ESA, to establish programs for the conservation of resident endangered or threatened species of fish or wildlife, including gray wolves.

The Service would manage the population of gray wolves that would be reintroduced and gray wolves living in or dispersing into Colorado as an endangered species in the state. This means that:

- State-led management actions and any actions that have the potential to result in a take of the species would be regulated under section 9 of the ESA, which establishes prohibitions related to endangered species.
- Federal agencies would be required to consult with the Service under section 7 of the ESA if reintroduced gray wolves may be present in the area of effect for a proposed federal action.
- The Service may issue section 10(a)(1)(A) permits to individuals or organizations for scientific activities or activities that support recovery of the species. The types of permits that may be

issued are discussed in section 2.4.4. The Service would not issue a section 10(a)(1)(A) permit to the State of Colorado under this alternative.

- If appropriate, an applicant could pursue a section 10(a)(1)(B) permit for incidental take in the course of otherwise legal activities. The Service may issue a section 10(a)(1)(B) permit through a separate process.

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

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 for any project or action they authorize, fund, or carry out that 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.
Opportunistic harassment	May be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).
Intentional harassment	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.
Additional taking by private citizens on private land	No lethal or injurious nonlethal take would be permitted.
Additional taking by grazing permittees on public land	No lethal or injurious nonlethal take would be permitted.
Agency take of wolves that repeatedly depredate livestock	No lethal or injurious nonlethal take would be permitted.
Incidental take	Incidental take could be permitted or exempted under other ESA authorities.
Additional taking provisions for agency employees	No lethal or injurious nonlethal take would be permitted.

2.4.2 Alternative 1, Preferred Alternative

Background

Section 10(j) of the ESA includes provisions for establishing an experimental population of a federally listed species. The designation "experimental population" had its origin in a 1982 amendment to the ESA, which created section 10(j). Before the 1982 amendment, the Service could reintroduce endangered species into unoccupied historical range, but reintroduction efforts were often met with public resistance. One reason for this opposition was that the Service had no management tools to address the potential for the listed species to disrupt land management activities. The "experimental population" designation gives the Service more flexibility to manage endangered species by relaxing "take" prohibitions and consultation requirements under the ESA.

An experimental population may be designated as “essential” or “nonessential.” An essential population is considered essential to the continued existence of a federally listed threatened or endangered species (USFWS 2018).

If a reintroduced population is designated experimental and nonessential under section 10(j), both take prohibitions under section 9 and consultation requirements under section 7 of the ESA are relaxed. Federal agencies are only required to confer with the Service on federal activities affecting a nonessential population that are likely to jeopardize the species (16 USC 1536). The exception would be for federal actions in national parks and national wildlife refuges that may affect a nonessential population, which would still require consultation with the Service under section 7. Management of a nonessential experimental population can be tailored to specific areas and specific local conditions and concerns. The experimental population rule has been used to reintroduce Mexican wolves to southern Arizona and New Mexico, red wolves to Alligator River National Wildlife Refuge in North Carolina, and gray wolves to the central Idaho and the Greater Yellowstone Area recovery areas in the northern Rocky Mountain region.

Summary

Under alternative 1, the Service would designate the population of gray wolves that would be reintroduced to Colorado as an experimental population under section 10(j) of the ESA. The Service would establish an experimental population boundary to include the entire state of Colorado, which would outline the geographic area to which the section 10(j) rule would apply. National park and national wildlife refuge lands in Colorado would be included in the experimental population boundary. However, site-specific regulations may apply on some federal ownerships. For instance, federal land management agencies such as the National Park Service (NPS) or the Service may prohibit use of firearms or other methods of lethal take in national parks or national wildlife refuges. Any take or method of take on public lands must be consistent with the federal rules and regulations on those public lands.

The section 10(j) rule would define the allowable take of gray wolves in response to the management activities proposed in the State Plan (see the detailed description of this alternative below for more information). The Service would determine, on the basis of the best available information, whether the population is essential to the continued existence of an endangered species or a threatened species in accordance with section 10(j)(2)(B) of the ESA during the process of developing the section 10(j) rule. This determination was a component of the proposed rule published in the *Federal Register* but not part of the NEPA process.

An experimental population must be established in an area that is wholly separate geographically from nonexperimental populations of the species. The Service has determined that the population of gray wolves that would be reintroduced in Colorado would be geographically separate from the delisted northern Rocky Mountains population and federally listed gray wolves in the remaining lower 44 states. Although a single group of gray wolves has been identified in Colorado as of September 2022, this group does not constitute a population, according to the definition provided in section 2.4.3. The nearest known pack of wolves in Wyoming is more than 124 miles from the Colorado border, which is more than two times the average dispersal distance for gray wolves in the northern Rocky Mountains (Jimenez et al. 2017). Gray wolves in most of Wyoming, outside the wolf trophy game management area (WTGMA), are considered predators and can be killed legally with no limit on such lethal take. Therefore, wolves are unlikely to persist long term in portions of Wyoming where they are designated as predatory animals (85 FR 69778, November 3, 2020). Despite these challenges, it is possible that gray wolves dispersing from the northern Rocky Mountains population could reach Colorado. However, these movements likely would be infrequent given Colorado’s distance from existing populations of gray wolves, the difficulty of dispersal across most of Wyoming, and the normal dispersal distances of gray wolves.

Commented [DT5]: Unsure why this has to be referenced in this manner, despite the predator status, wolves have dispersed to Colorado and are the wolves that are currently there and have even dispersed to the Grand Canyon. This may just be semantics but is continuously used by groups opposed to the dual status classification in Wyoming.

Detailed Description

Under alternative 1, the Service would designate the population of gray wolves that would be reintroduced by the State of Colorado as an experimental population. The extent of the proposed experimental population boundary would be the entire state of Colorado (see figure 2-1). Gray wolves may disperse long distances from the State’s initial reintroduction sites, so including the entire state in the experimental population boundary would provide consistent regulatory management of take across the state.

Under the section 10(j) rule, the population of gray wolves that would be reintroduced to Colorado, wolves living in the state, or wolves that naturally disperse into the state, would be managed under special regulations inside the proposed experimental population boundary. When the proposed 10(j) rule is finalized, “take” as defined under the ESA, would be allowed to occur in some instances. “Take” under the ESA means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. Provisions related to take that would be included in the section 10(j) rule are displayed in table 2-2. Any provisions that involve lethal take would not apply if there were evidence of unusual attractants or artificial or intentional feeding.

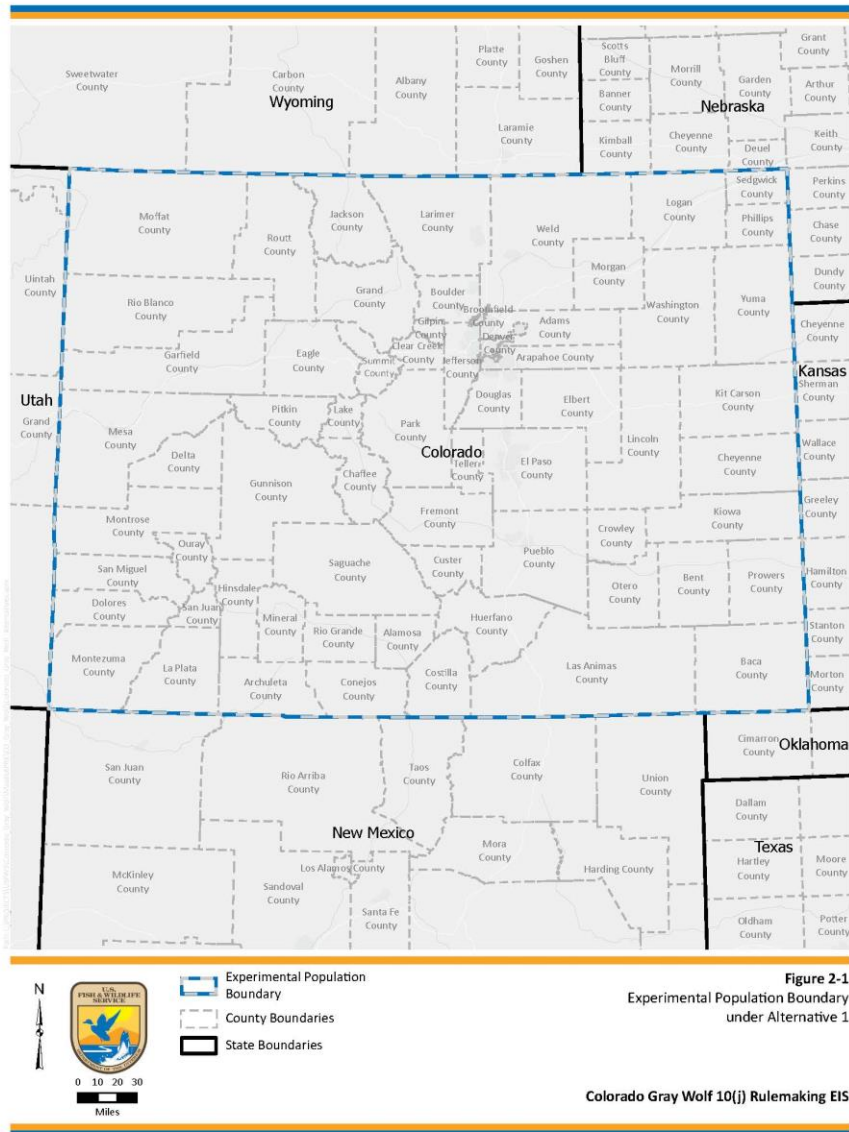


Table 2-2. Actions Permitted under Alternative 1

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(j)(2)(C)(i)).
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.
Opportunistic harassment	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.
Intentional harassment	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. Intentional harassment must be reported to the Service or a designated agent within seven days.
Taking of wolves "in the act" of depredation on private land	Consistent with State or Tribal requirements, any landowner may take a gray wolf in the act of attacking livestock or working dogs on private land, provided the landowner provides evidence of livestock, stock animals, or working 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 working 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	Consistent with State or Tribal requirements, any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may take a gray wolf in the act of attacking livestock or working dogs legally present on public lands without prior written authorization. The Service or designated agent(s) must be able to confirm the livestock or working 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. Any person legally present on public land may immediately take a wolf that is in the act of attacking the individual's stock animal or working dog, provided conditions noted in "taking of wolves in the act on private land" are met. Any take or method of take on public lands must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.

Situation	Alternative Element
Additional taking by private citizens on private land	At the Service's or designated agents' direction, the Service or designated agent may issue a repeated depredation written take authorization of limited duration (45 days or less) to a landowner or their employees to take up to a specified (by the Service or our designated agent) number of wolves on their private land if: (1) the landowner has had at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent within the last 30 days; and (2) the Service or designated agent has determined that repeatedly depredating wolves are routinely present on the private land and present a significant risk to the health and safety of livestock; and (3) the Service or designated agent has authorized lethal removal of wolves from that same private land. These authorizations may be terminated at any time once threats have been resolved or minimized. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.
Additional taking by grazing permittees on public land	At the Service's or designated agent(s) direction, the Service or designated agent(s) may issue a repeated depredation written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take repeatedly depredating 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 repeatedly depredating 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 repeatedly depredating wolves from that same allotment. These authorizations may be terminated at any time once threats have been resolved or minimized. Any take or method of take on public land must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.
Agency take of wolves that repeatedly depredate livestock	The Service and designated agent(s) may carry out harassment, nonlethal control measures, relocation, placement in captivity, or lethal control of repeatedly depredating wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, working dogs, or other domestic animals, or remains of livestock, working 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, working 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.
Incidental take	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 designated agent(s) within 24 hours (the Service will allow additional time if access to the site of the take is limited). Shooting a wolf as a result of mistaking it for another species is not considered accidental and may be referred to the appropriate authorities for prosecution.

Situation	Alternative Element
Additional taking provisions for agency employees	Any employee or agent of the Service may take a wolf from the wild if such action is (1) for take related to the release, tracking, monitoring, recapture, and management for the experimental population; (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; or (5) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.
Tribal take to reduce impacts on wild ungulates	The Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the proposal must be used to review the proposal. Upon Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.

Commented [DT6]: Why only tribal lands, are other lands not as important to ungulates as tribal lands?

Individual gray wolves that disperse from, or leave, the experimental population boundary would have the status under the ESA that applies to wolves in the geographic area to which they travel. For example, wolves that travel outside the experimental population boundary to Nebraska would be managed as federally listed endangered species pursuant to the ESA, while wolves that travel into Wyoming would be managed pursuant to state rules and regulations because the species is not listed under the ESA in Wyoming.

Commented [DT7]: Critical inclusion, appreciated from other agency perspectives.

2.4.3 Alternative 2

Background

The Service developed alternative 2 to address the possibility that an existing population of gray wolves is identified in Colorado before the section 10(j) rule is finalized. An existing population, as defined by the Service (USFWS 1994), may include wolves that are living in the state and wolves that naturally disperse into the state. If an existing population of gray wolves is determined to exist in Colorado before the section 10(j) rule is finalized, the State could apply for a permit, and the Service could issue the State of Colorado a permit under section 10(a)(1)(A) of the ESA for management of the existing population. If an existing population of gray wolves is identified before the section 10(j) rule is finalized, these wolves would be managed as an endangered species within the 10(a)(1)(A) permit area.

A section 10(j) rule would be developed for the remainder of the state in an area that is wholly separate geographically from the existing population. Lands managed by the NPS and national wildlife refuge lands in Colorado would be included in the experimental population boundary depending on the location of any existing population in the state.

As noted in section 1.4, one reproductively active group of gray wolves had been documented in Colorado as of the end of 2021, and no reproduction was documented by this group in 2022. As of June 2023, this group included the only two gray wolves known to occur in the state, and the Service has determined that these wolves do not meet the definition of a population. CPW biologists continue to monitor wolves in the state using different techniques, including Global Positioning System or very high frequency telemetry collars, when available and functional, to confirm locations and movement patterns; fixed-wing aircraft surveys; trail cameras; field observations; and investigations of reports from the public. CPW maintains a wolf sighting form online (<https://cpw.state.co.us/learn/Pages/Sighting-Forms.aspx>). When a report is submitted, the information is shared with field staff, who may follow up, depending on details provided in the report. Reports that have substantial detail and credibility are prioritized for investigation. If scat or hair samples are available, CPW analyzes those samples for genetic confirmation of species. CPW regional staff investigate claims of depredation due to wolves and use a variety of tools to gather evidence to make a conclusion. Information from the public, livestock producers, and agency staff is considered when evaluating the potential presence of wolves. Through all efforts and follow-up, as of June 2023, the only known wolves documented in Colorado reside in and around the North Park area (Odell 2023).

Alternative 2 considers the potential for previously unknown breeding groups of gray wolves to be identified in the state before the end of 2023 when the 10(j) rule is expected to be finalized. Section 10(j) of the ESA requires an experimental population to be established wholly separate geographically from nonexperimental populations of the same species, determined based on whether a population of the species is currently present in a geographic area. The Service defined a wolf population in the 1994 EIS for the *Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho* (USFWS 1994), as follows:

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

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

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

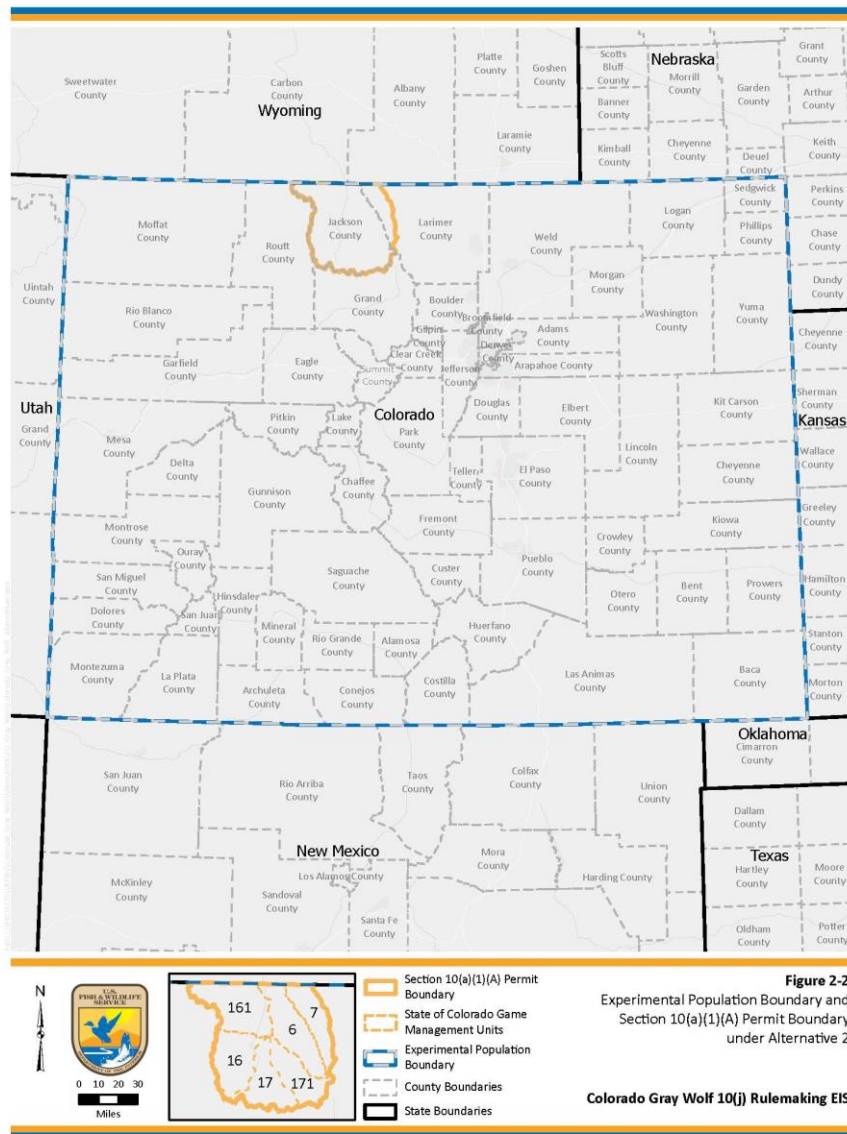
Summary

Under alternative 2, if an existing population of gray wolves is determined to exist in Colorado, the Service would issue a section 10(j) rule for the population of gray wolves that would be reintroduced to

Colorado in a limited territory and issue a permit under section 10(a)(1)(A) of the ESA for management of the existing gray wolf population in Colorado on state and private lands in an area that is wholly separate geographically the experimental population boundary. Section 10(a)(1)(A) authorizes the Service to develop conservation agreements to further conserve the species. Similar to a section 10(j) rule, a section 10(a)(1)(A) permit allows management flexibility for populations of federally listed threatened or endangered species while providing for conservation of the species as a whole. A section 10(a)(1)(A) permit is applied to existing populations, rather than reintroduced or experimental, populations. If an existing population is not identified before a section 10(j) rule is issued, existing wolves living in or naturally dispersing to Colorado before that time would be managed under the section 10(j) rule; a separate section 10(a)(1)(A) permit would not be issued following promulgation of the section 10(j) rule.

The geographic boundaries for the 10(a)(1)(A) permit area would be delineated based on natural or human-made geographic features (i.e., mountain ranges, rivers, interstates) that encompass the range of the existing population to ensure that the existing, nonexperimental population is wholly separate geographically from the population of gray wolves that would be reintroduced by the State. For the purposes of analysis, an example boundary for a section 10(a)(1)(A) permit could follow the boundaries of the State of Colorado's large game management units in areas where gray wolves are currently found, where these boundaries follow geographic features. For example, and for the purposes of this analysis, it is assumed that the following big game units in Jackson and Larimer Counties would make up the geographic boundary of the section 10(a)(1)(A) permit: 161, 6, 7, 16, 17, and 171. These units represent the area where wolves are currently found in Colorado. Figure 2-2 shows the big game units that are used for analysis under alternative 2. Depending on the locations where an existing population is identified (if one is identified), the boundaries of the 10(a)(1)(A) permit area may change from the boundaries depicted in this EIS.

The Service would issue a section 10(j) rule for the proposed experimental population of reintroduced wolves and an experimental population boundary that would include a smaller geographic area in which the final rule would apply. Within the experimental population boundary, federal regulations for the gray wolf population that would be reintroduced would be the same as those as described above under alternative 1. Similar to alternative 1, under alternative 2, the draft 10(j) rule does not provide for take of wolves to mitigate potential impacts to ungulate populations; however, a provision to address potential impacts to ungulates has been included as an option in this alternative and could be adopted in the final rule. The experimental population boundary would be established in those areas of the state not encompassed by the section 10(a)(1)(A) permit and outside any federal lands that are part of the range of an existing population of wolves (figure 2-2).



Detailed Description

The section 10(a)(1)(A) permit under alternative 2 would exempt many of the same management tools from take as those that would be exempted in the section 10(j) rule, except lethal take. No lethal take of gray wolves would be permitted within the section 10(a)(1)(A) permit boundary. Allowed take in the experimental population boundary and section 10(a)(1)(A) permit boundary is included in table 2-3.

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

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(j)(2)(C)(i)). 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.
Opportunistic harassment	Within the experimental population boundary, 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. Within the 10(a)(1)(A) permit area, opportunistic harassment may be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).
Intentional harassment	Within the experimental population boundary, 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. Intentional harassment must be reported to the Service or a designated agent within seven days. 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 private land	Within the experimental population boundary, consistent with state or Tribal requirements, any landowner may take a gray wolf in the act of attacking livestock or working dogs on private land, provided the landowner provides evidence of livestock, stock animals, or working 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 working 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
	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	<p>Within the experimental population boundary, consistent with state or Tribal requirements, any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may take a gray wolf in the act of attacking livestock or working dogs legally present on public lands without prior written authorization. The Service or designated agent(s) must be able to confirm the livestock or working 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. Any person legally present on public land may immediately take a wolf that is in the act of attacking the individual’s stock animal or working dog, provided conditions noted in “taking of wolves in the act on private land” are met. Any take or method of take on public lands must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.</p>
Additional taking by private citizens on private land	<p>Within the experimental population boundary, at the Service’s or designated agents’ direction, the Service or designated agent may issue a repeated depredation written take authorization of limited duration (45 days or less) to a landowner or their employees to take up to a specified (by the Service or designated agent) number of wolves on private land if: (1) the landowner has had at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent within the last 30 days; and (2) the Service or designated agent has determined that repeatedly depredating wolves are routinely present on the private land and present a significant risk to the health and safety of livestock; and (3) the Service or designated agent has authorized lethal removal of wolves from that same private land. These authorizations may be terminated at any time once threats have been resolved or minimized. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.</p> <p>Within the 10(a)(1)(A) area, no lethal take would be permitted; only nonlethal take would be allowed.</p>
Additional taking by grazing permittees on public land	<p>Within the experimental population boundary, at the Service’s or designated agent(s) direction, the Service or designated agent(s) may issue a repeated depredation written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take repeatedly depredating 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 repeatedly depredating 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 repeatedly depredating wolves from that same allotment. These authorizations may be terminated at any time once threats have been resolved or minimized. Any take or method of take on public land must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.</p>

Situation	Alternative Element
Agency take of wolves that repeatedly depredate livestock	<p>Within the experimental population boundary, the Service and designated agent(s) may carry out harassment, nonlethal control measures, relocation, placement in captivity, or lethal control of repeatedly depredating wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, working dogs, or other domestic animals, or remains of livestock, working 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, working 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.</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	<p>Within the experimental population boundary, 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 designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited). Shooting a wolf as a result of mistaking it for another species is not considered accidental and may be referred to the appropriate authorities for prosecution.</p> <p>Within the 10(a)(1)(A) permit area, no incidental take would be permitted.</p>
Additional taking provisions for agency employees	<p>Within the experimental population boundary, any employee or agent of the Service may take a wolf from the wild if such action is (1) for take related to the release, tracking, monitoring, recapture, and management for the experimental population; (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; or (5) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.</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 remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.</p>
Tribal take to reduce impacts on wild ungulates	<p>Within the experimental population boundary, the Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the</p>

Situation	Alternative Element
	<p>proposal must be used to review the proposal. Upon Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted; only nonlethal take would be allowed.</p>

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

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Regulatory Management Framework Used	All ESA protections apply.	Section 10(j) throughout entire state of Colorado	If an existing population is documented before a section 10(j) rule is finalized, the State could apply for a permit, and the Service could issue the State a section 10(a)(1)(A) permit in the portion(s) of Colorado in which an existing population (as defined by the Service) is located, if discovered. For analysis purposes, this alternative is based on the following State of Colorado Big Game Management units: 161, 6, 7, 16, 17, and 171, which occur in Jackson County and the western part of Larimer County (see figure 2-2). An experimental population boundary would be established for the remainder of the state outside this area that would be wholly separate geographically from the existing population.
Listed status of wolves	Endangered	Threatened	Threatened within the experimental population boundary. Endangered in area covered under the section 10(a)(1)(A) permit.
Consultation (per section 7)	Federal agencies are required to consult with the Service for any project or action they authorize, fund, or carry out that 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 (16 USC §1539(j)(2)(C)(i)).	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(j)(2)(C)(i)). 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
Opportunistic harassment	May be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).	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.	Within the experimental population boundary, 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. Within the 10(a)(1)(A) permit area, opportunistic harassment may be authorized under a separate authority (section 10(a)(1)(A) of the ESA [16 USC §1539(a)(1)(A)]).
Intentional harassment	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. Intentional harassment must be reported to the Service or a designated agent within seven days.	Within the experimental population boundary, 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 private land	No lethal or injurious nonlethal take would be permitted.	Consistent with state or Tribal requirements, any landowner may take a gray wolf in the act of attacking livestock or working dogs on private land, provided the landowner provides evidence of livestock, stock animals, or working 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 working 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.	Consistent with state or Tribal requirements, any livestock producer and public land permittee who is legally using public land under a valid federal land-use permit may take a gray wolf in the act of attacking livestock or working dogs legally present on public lands without prior written authorization. The Service or designated agent(s) must be able to confirm the livestock or working 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. Any person legally present on public land may immediately take a wolf that is in the act of attacking the individual's stock animal or working dog, provided conditions noted in "taking of wolves in the act on private land" are met. Any take or method of take on public lands must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent within 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	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
Additional taking by private citizens on private land	No lethal or injurious nonlethal take would be permitted.	At the Service's or designated agents' direction, the Service or designated agent may issue a repeated depredation written take authorization of limited duration (45 days or less) to a landowner or their employees to take up to a specified (by the Service or designated agent) number of wolves on their private land if: (1) the landowner has had at least one depredation by wolves on livestock that has been confirmed by the Service or designated agent within the last 30 days; and (2) the Service or designated agent has determined that repeatedly depredating wolves are routinely present on the private land and present a significant risk to the health and safety of livestock; and (3) the Service or designated agent has authorized lethal removal of wolves from that same private land. These authorizations may be terminated at any time once threats have been resolved or minimized. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	Within the experimental population boundary, issuance of a repeated depredation written take authorization for repeatedly depredating 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
Additional taking by grazing permittees on public land	No lethal or injurious nonlethal take would be permitted.	At the Service's or designated agent(s) direction, the Service or designated agent(s) may issue a repeated depredation written take authorization of limited duration (45 days or less) to a public land-grazing permittee to take repeatedly depredating 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 repeatedly depredating 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 repeatedly depredating wolves from that same allotment. These authorizations may be terminated at any time once threats have been resolved or minimized. Any take or method of take on public land must be consistent with the rules and regulations on those public lands. Any lethal or injurious take must be reported to the Service or a designated agent with 24 hours. The Service will allow a reasonable extension of the time limit if access to the site is limited.	Within the 10(j) boundary, issuance of repeated depredation written take authorization for repeatedly depredating 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
Agency take of wolves that repeatedly depredate livestock	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 repeatedly depredating wolves. The Service or designated agent(s) would consider: (1) evidence of wounded livestock, working dogs, or other domestic animals, or remains of livestock, working 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, working dogs, or other domestic animals; (2) the likelihood 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, 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	Incidental take could be permitted or exempted under other ESA authorities.	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 designated agent within 24 hours (the Service may allow additional time if access to the site of the take is limited). Shooting a wolf as a result of mistaking it for another species is not considered accidental and may be referred to the appropriate authorities for prosecution.	Within the experimental population boundary, same as alternative 1. Within the 10(a)(1)(A) permit area, same as the no-action alternative.

Commented [DT8]: WHY would this not be considered accidental? We realize intent is difficult to prosecute, but this is not unheard of in areas where wolves and coyotes are sympatric or with other species as well.

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Additional taking provisions for agency employees	No lethal or injurious nonlethal take would be permitted.	Any employee or agent of the Service may take a wolf from the wild if such action is (1) for take related to the release, tracking, monitoring, recapture, and management for the experimental population; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to dispose of a dead specimen; (4) to salvage a dead specimen that may be used for scientific study; (5) to aid in law enforcement investigations involving wolves; or (6) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.	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 take related to the release, tracking, monitoring, recapture, and management for the experimental population; (2) to aid or euthanize sick, injured, or orphaned wolves; (3) to dispose of a dead specimen; (4) to salvage a dead specimen that may be used for scientific study; (5) to aid in law enforcement investigations involving wolves; or (6) to remove wolves with abnormal physical or behavioral characteristics, as determined by the Service or designated agents, to prevent them from passing on or teaching those traits to other wolves.
Tribal take to reduce impacts on wild ungulates	No lethal or injurious nonlethal take would be permitted.	The Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to	Within the experimental population boundary, the Service has included an exception to allow nonlethal and lethal management of gray wolves that are having an unacceptable impact on ungulate herds or populations on Tribal lands. This exception requires a science-based proposal that must, at a minimum, include the following information: (1) the basis of ungulate population or herd management objectives; (2) data indicating that the ungulate herd is below management objectives; (3) what data indicate that wolves are a major cause of the unacceptable impact to the ungulate population; (4) why wolf removal is a warranted solution to help restore the ungulate herd to management objectives; (5) the level and duration of wolf removal being proposed; (6) how ungulate population response to wolf removal will be measured and control actions adjusted for effectiveness; and (7) demonstration that attempts were and are being made to address other identified major causes of ungulate herd or population declines or of Tribal government commitment to implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the proposal must be used to review the proposal. Upon

Components of the Alternatives	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
		<p>implement possible remedies or conservation measures in addition to wolf removal. The proposal must be subjected to both public and peer review prior to it being finalized and submitted to the Service for review. At least three independent peer reviewers with relevant expertise in the subject matter that are not staff of the Tribe submitting the proposal must be used to review the proposal. Upon Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.</p>	<p>Service review, and before wolf removals can be authorized, the Service will evaluate the information provided by the requesting Tribe and provide a written determination to the requesting tribal game and fish agency on whether such actions are scientifically based and warranted.</p> <p>Within the 10(a)(1)(A) permit area, no lethal take would be permitted. Only nonlethal take would be allowed.</p>

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 five-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 are adverse or beneficial 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, as well as during review of the draft EIS, in compliance with NEPA and its implementing regulations (40 CFR 1501.9).

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, the decision regarding whether the issuance of a section 10(j) rule for gray wolves in Colorado would affect livestock producers and outfitters and guides was determined to be related to the decision being made. 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. Other commenters were concerned about the use of lethal management measures, reintroduction in general, or about the population levels of gray wolf that could be sustained in Colorado. These issues are outside the scope of the 10(j) rule and this EIS or do not meet the purpose and need for the proposed action as described in section 2.3.3; therefore, they are not analyzed in the EIS. Explanations are included below for issues that are not analyzed in detail in the EIS.

Issues related to the reintroduction in general are not part of the scope of the analysis of this EIS process because the State of Colorado would reintroduce gray wolves to a portion of the species’ historical range in the state in compliance with Colorado Revised Statute 33-2-105.8, regardless of the alternative implemented, and would be able to reintroduce the species without additional authorization by the Service, as discussed in section 2.4.1. However, impacts of the State’s reintroduction of gray wolves are considered under the cumulative impacts section of this EIS (section 4.9).

Environmental Resources and Issues Evaluated in the EIS

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

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), and other species of special concern.
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, hunting on lands with Tribal treaty rights, and livestock production by Tribes or Tribal members.
Socioeconomic Resources	Potential impacts on ranch operations, outfitters, guides, and hunting from the presence or absence of management flexibility.
Environmental Justice	Potential impacts on minority and low-income population groups of concern in the study area from the presence or absence of management flexibility.

Environmental Resources and Issues Not Evaluated in Detail the EIS

Environmental resources and issues that are not analyzed in detail in the EIS are listed in table 3-2, including a description of why these resources and issues are not evaluated in detail.

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.
Air – Climate Change	<p>The Service's proposed action would not result in a notable increase in emissions of greenhouse gases above current operational emissions. Emissions would result from vehicle trips by Service personnel or designated agents in the course of implementing the section 10(j) rule, depending on the alternative selected. Regardless of the alternative selected, vehicle trips required to implement the proposed action would be similar to the existing number of trips conducted as part of current operations.</p> <p>Additionally, climate change is not expected to affect the gray wolf to a measurable degree. Variations in environmental conditions (such as drought, fire, and prey fluctuations) and episodic threats (e.g., disease) are characteristic of wild populations of most species, including gray wolves. Gray wolf populations that are genetically robust are more likely to recover from episodic threats (USFWS 2020b; USFWS 2012). Based on the above, measurable cumulative impacts on gray wolves in Colorado from changing climate conditions and the limited take that would be allowed under the 10(j) rule are not expected.</p>
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.

Environmental Resources	Issues
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.
Biological Resources – Wildlife Disease Risk	Wolves can transmit disease, which can affect other wildlife species; however, available data are not conclusive regarding the likelihood of wolves affecting the health of ungulate populations (negatively or positively) over the long term. Any potential changes in the geographic extent of diseases or disease vectors as a result of the presence of wolves on the landscape would be a potential consequence of the State Plan to reintroduce wolves and would not be influenced by issuing and implementing the 10(j) rule. The proposed action would not result in changes in the way risk of wildlife diseases are managed; therefore, this issue is not evaluated in detail in the EIS.
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.
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 Cultural Resources.
Geological Resources – Geologic Features	Providing management flexibility for gray wolves that would be reintroduced to Colorado would not result in localized or widespread ground disturbance that would affect geologic features.
Geological Resources – Geologic Processes	As noted above, the proposed action would not result in localized or widespread ground disturbance.
Lightscales	The proposed action would not affect lightscales or views of the night sky.
Human Health and Safety	The ESA allows for take of individual wolves for personal protection. While human encounters with wolves have the potential to result in human injury, this is very rare. However, 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. Any potential changes in the geographic extent of diseases or disease vectors or risk to human health and safety as a result of the presence of wolves on the landscape would be a potential consequence of the State Plan to reintroduce wolves and would not be influenced by issuing and implementing the 10(j) rule. 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.

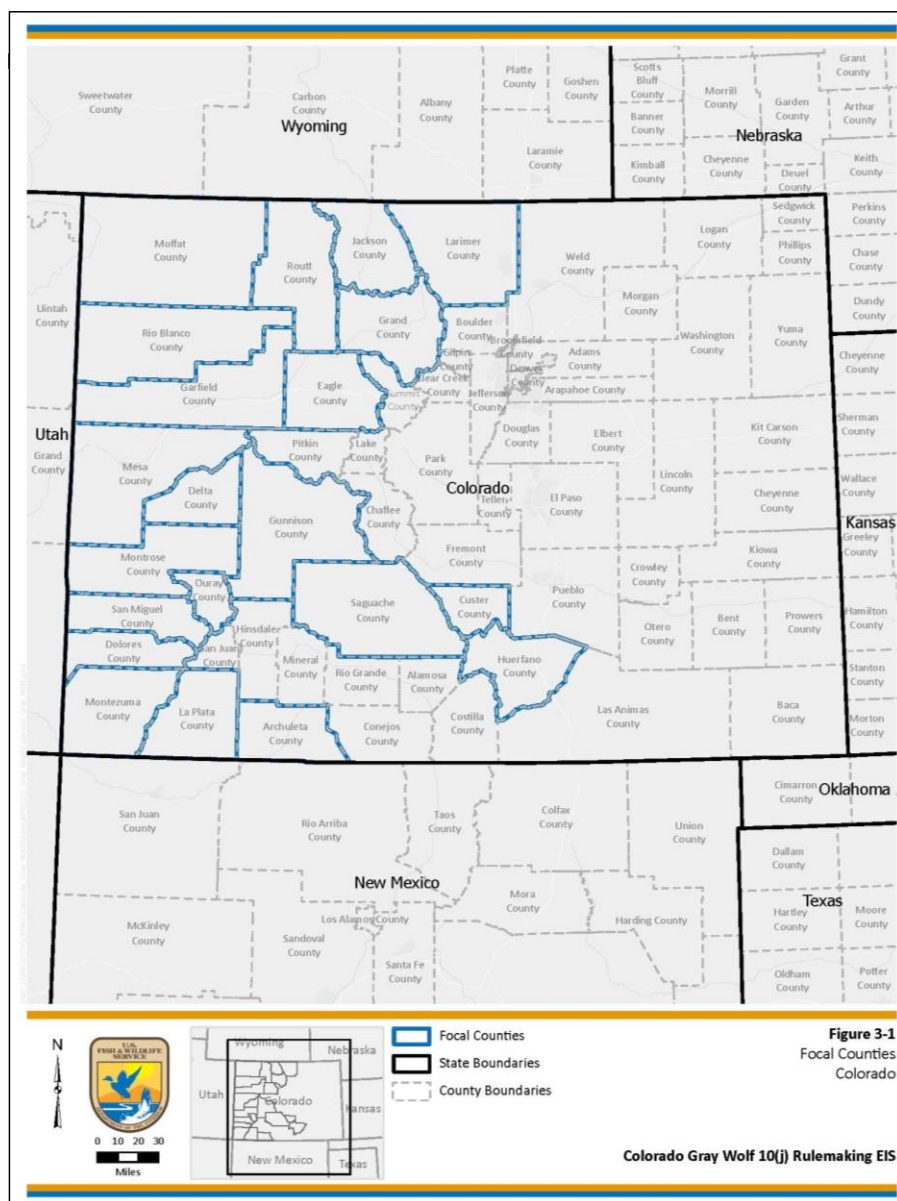
Environmental Resources	Issues
Viewsheds	Providing management flexibility through a regulatory framework may result in intermittent, localized visual impacts during management activities. These impacts would be minimal and therefore are not evaluated in detail in the EIS.
Recreation – Recreational Resources	The proposed action would not affect overall access to or the quality of recreational resources in Colorado. The presence of gray wolves as a result of the State's reintroduction may attract wildlife watchers to areas where wolves are present or discourage recreational users from accessing remote or wilderness areas due to perceived safety risks. Changes in recreational use resulting from the presence of wolves on the landscape would be a consequence of the State Plan and would not be affected by the limited take that would be allowed under alternatives 1 or 2 to minimize conflicts. 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, birdwatching, or viewing wolves. Therefore, recreational resources are not discussed in detail in the EIS.
Socioeconomic Resources – Mining, Oil and Gas, and Timber Industries	The proposed action would not result in socioeconomic effects on industries outside livestock production and outdoor recreation (specifically, services provided by outfitters and guides), including the mining, oil and gas, and timber industries. The proposed action could result in beneficial impacts to these and other industries under alternatives 1 or 2 because incidental take would be allowed under the circumstances described in sections 2.4.2 and 2.4.3. Potential impacts resulting from the presence of wolves on the landscape or wolf management actions that would fall under the State Plan are outside the scope of the proposed action and the analysis in the EIS. Because adverse effects on these industries are not anticipated from the Service's proposed action, these industries are not assessed as part of the socioeconomic resources analysis.
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.

3.1.2 Study Area

The study area for the affected environment analysis includes the entire state of Colorado. The affected environment (Chapter 3) and environmental consequences (Chapter 4) sections of the EIS provide information and analysis at this statewide level. In addition to the statewide analysis, the Service identified 21 focal counties for more detailed study in the EIS. The focal counties have high ecological suitability for gray wolves, as determined by Ditmer et al. (2022). The Service overlaid a map of Colorado counties on modeling of ecological suitability in summer and winter to determine the list of focal counties (Ditmer 2022; see Appendix E). While the Service recognizes that gray wolves that would be reintroduced to Colorado may occur outside this area, these areas are anticipated to contain the most suitable habitat.

The focal counties include Colorado counties in proximity to suitable reintroduction sites identified by the State in the Western Slope and counties to which wolves are most likely to disperse based on suitable habitat and prey density. Areas with high ecological suitability for gray wolves may have low or high risk for human-wolf conflicts. The Service identified 21 focal counties: Archuleta, Custer, Delta, Dolores, Eagle, Garfield, Grand,

Gunnison, Huerfano, Jackson, La Plata, Larimer, Mesa, Moffat, Montezuma, Montrose, Ouray, Rio Blanco, Routt, Saguache, and San Miguel (figure 3-1). While these counties encompass potential reintroduction sites on the Western Slope (e.g., Delta, Dolores, Eagle, Garfield, Grand, Gunnison, La Plata, Mesa, Moffat, Montezuma, Montrose, Ouray, Rio Blanco, Routt, San Miguel and portions of Archuleta or Saguache Counties) or areas where gray wolves are most likely to disperse based on the ecological factors noted above, wolves can disperse long distances and may disperse to areas of the state outside the focal counties. The Service is proposing to implement regulatory flexibility consistent with section 10(j) of the ESA statewide to account for dispersal of gray wolves away from reintroduction sites; therefore, the analysis of the affected environment and potential impacts in this EIS considers both the statewide study area and the focal counties.



3.2 SPECIES OF SPECIAL CONCERN

Species of special concern include federally listed species, those that are federally listed or proposed to be listed as endangered or threatened or that are candidate species for protection under the ESA, and those listed as endangered or threatened at the State level in Colorado or identified as Species of Greatest Conservation Need (SGCN) in Colorado's State Wildlife Action Plan (SWAP; CPW 2015). Section 3.1.2, above, provides more detail on regions of the state with greater ecological suitability for gray wolves and the methodology used to define these areas by identifying focal counties for this analysis. This discussion of existing conditions for species of special concern and the analysis that follows focuses on the 21 focal counties but also considers the potential for statewide impacts (figure 2-1). The following section discusses the federally listed gray wolf, followed by other federally listed species. When considering other federally listed species, only listed mammals and birds were analyzed because management of gray wolves would not affect listed fish, insects, flowering plants, or vegetation.

3.2.1 Gray Wolf

History

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

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

Current Population Status and Distribution

The Service and the NPS reintroduced gray wolves to central Idaho and Yellowstone National Park in the 1990s, and by 2015, approximately 2,000 wolves were estimated to inhabit the northern Rocky Mountains. In addition, wolf populations have been established in smaller numbers in Washington, Oregon, and Northern California (Smith et al. 2010; USFWS 2020a). Dispersing wolves from the northern Rocky Mountains population have been documented in Colorado; however, Colorado is geographically separate from the northern Rocky Mountains.

CPW receives approximately 100 reported sightings of wolves per year, although not all are valid. Since 2004, lone wolves have been confirmed numerous times in Colorado, although no resident groups were documented in the state until January 2020, when CPW confirmed a group of at least six wolves in Moffat County near the Wyoming and Utah border. That group was visually observed, and genetic tests were conducted on scat samples near a scavenged elk carcass, which confirmed at least four related individuals in the group (CPW 2020a). Separately, a collared adult female from the Snake River Pack in Wyoming was documented in north-central Colorado in July 2019, and CPW collared an adult male in January 2021 in Jackson County. In June 2021, a litter of six pups was observed with the Snake River female and the CPW-collared male (now dubbed the "North Park

pack”). In February 2022, one of the yearling female wolves from that litter was collared in North Park. In February 2023, CPW recollared the adult male initially collared in 2021 (replacing his existing collar) and collared a subadult male from the North Park pack’s 2021 litter (CPW 2023b).

Wolves have been confirmed in Colorado, including one breeding pair in 2021, although a wolf population has not been recognized in the state as of June 2023 because it does not meet the Service’s definition of a wolf population, which is “at least two breeding pairs of wild wolves successfully raising at least two young each year (until December 31 of the year of their birth), for two consecutive years” (USFWS 1994).

Ecology

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

Group Sizes and Territories. Gray wolves are a social species that live in groups led by a dominant breeding pair (alphas). Groups consist of the breeding pair’s offspring from previous years and their new pups, as well as other breeding-aged adults. Group size varies and may include more than 30 animals (Ginsberg and Macdonald 1990); however, average group sizes are typically smaller (e.g., 9.8 individuals in Yellowstone National Park [NPS 2022a]; 5.92 individuals in the northern Rocky Mountains [Sells et al. 2022]). Wolves may live in the wild up to 13 years (Mech 1988), but more commonly have a lifespan of 2 to 5 years; only 18 percent of wolves in Yellowstone National Park reached 6 years of age or older (NPS 2022a).

Wolf density may be naturally controlled by prey density (Mech and Barber-Meyer 2015) or intrinsically self-regulated because of social strife and territoriality (Cariappa et al. 2011; Cubaynes et al. 2014). Or as expected to be the case in Colorado, wolf density may be extrinsically regulated as a result of social carrying capacity¹ (TWG 2022a).

A wolf group’s home range/territory size varies by season and by year. From spring to fall, the home range is smaller because activity is centered around the den and rendezvous sites. By October, pups are able to travel and hunt with the group, thus increasing the size of the home range. Prey availability, intraspecific competition with nearby groups, and landscape characteristics (both biotic and abiotic) all influence wolf territory size. Wolf group territory sizes in the northern Rocky Mountains have ranged from 24 to 934 square miles (Colorado Wolf Management Working Group 2004).

Reproduction. Wolves reach reproductive maturity at approximately two years of age (Ginsberg and Macdonald 1990), and breeding typically occurs only between the dominant male and female in a group (although groups with additional reproductively mature females have been documented with more than one litter per year; Mech and Boitani 2003; USFWS et al. 2001). Wolves establish one or several den sites up to one month prior to giving birth (Paquet and Carbyn 2003), and pups are born in April. Litter sizes can range from one to nine (Plotscher et al. 1997), but the average is five pups (Mech 1970; Ausband et al. 2017). Pup survival increases when ungulate prey are abundant (Fuller et al. 2003) and when they are in larger groups with more nonbreeding adults (Brainerd et al. 2008). Pup survival is reduced when the breeding individuals of a pack are removed as a result of harvest or

¹ “Social carrying capacity” is a concept developed by social scientists and extended to wildlife management to describe human tolerance for wildlife (Decker and Purdy 1988). Also coined “wildlife stakeholder acceptance capacity” (Carpenter et al. 2000), the concept is connected to social receptivity to wildlife conservation and management goals and human willingness to coexist with wildlife, particularly large carnivores (Peyton et al. 2007; Madden and McQuinn 2014; Young et al. 2015b).

management-led lethal control; these actions typically lead to smaller group size and breeder turnover, which decreases pack stability and pup survival (Brainerd et al. 2008; Ausband et al. 2017).

Dispersal. Wolves can disperse across long distances (Ditmer et al. 2022; Morales-Gonzalez et al. 2022), which has allowed them to recolonize former habitats where human-caused mortality sources are limited. Lone long-distance dispersals have been documented in nearly all states within the historical gray wolf range (USFWS 2020b). Both male and female subadults will disperse hundreds of miles; radio collar data have demonstrated wolves moving more than 600 miles straight line distance (Mech and Boitani 2003; Jimenez et al. 2017; Morales-Gonzalez et al. 2022). Wolves that have been confirmed in Colorado are thought to have dispersed from Wyoming (Ditmer et al. 2022) and Montana (CPW 2023b).

Genetics. Taxonomic relationships of wolves in North America have been studied extensively, although researchers disagree about the genotypic relationship between western gray wolves, eastern wolves, and red wolves (USFWS 2020b; Carroll et al. 2021). Wolves that have dispersed to Colorado are part of the Western United States metapopulation, which is also connected to the large population (>15,000) of wolves in western Canada (Jimenez et al. 2017; USFWS 2020b). The behavioral characteristic of young wolves to disperse when they reach sexual maturity enables extensive genetic exchange through immigration and emigration with adjacent populations (Colorado Wolf Management Working Group 2004).

Food Habits. Gray wolves are opportunistic carnivores, and although they will prey on small mammals and birds, carrion, and even plant matter, they tend to focus on large ungulates (Fuller 1989; Colorado Wolf Management Working Group 2004; Stahler et al. 2006; Newsome et al. 2016). However, wolves have demonstrated the ability to shift their diet to take advantage of seasonally available food sources, e.g., beavers (*Castor canadensis*; Gable and Windels 2018; Gable et al. 2020).

Depending on the size of prey, adult wolves may consume from 10 to more than 20 ungulates (i.e., elk [*Cervus canadensis*], mule deer [*Odocoileus hemionus*]) per year, including newborn/juvenile calves (Fuller 1989; NPS 2022a). Ungulate densities in Colorado exceed those in other states where wolves maintain a viable population (Ditmer et al. 2022), and wolves are most likely to prey upon elk, mule deer, and white-tailed deer (*O. virginianus*; Colorado Wolf Management Working Group 2004). Colorado has the largest population of elk in any state (>300,000 individuals; Lukacs et al. 2018; CPW 2021a). The deer population was estimated to be 416,426 in 2021 (CPW 2021b), which is a decrease from the early 2000s and less than the State's population objectives (CPW 2020b).

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

Domestic Prey Species/Livestock Depredation. In addition to wild ungulates, wolves are known to kill and prey on livestock (most commonly cattle and sheep) and other domestic animals. The extent to which this occurs depends on the density of wolves, the group size, and the density and spatial overlap of wild ungulate populations and livestock. In addition, livestock husbandry practices, land cover type, human and road density, the severity of winters, and local hunting pressure all contribute to the likelihood of depredations (DeCesare et al. 2018; Janeiro-Otero et al. 2020; Gese et al. 2021). Livestock depredation may be a learned behavior by individual wolves who become repeat offenders (Bradley et al. 2015; DeCesare et al. 2018). DeCesare et al. (2018) found the strongest predictor of wolf depredation in Montana was the occurrence of depredation in the previous year; however, the authors noted that may have been as a result of animal husbandry practices and increased spatial overlap with livestock in certain districts as much as an intrinsic learning behavior by individual wolves. Generally, wolves primarily prey on native ungulates but sometimes shift toward depredating livestock (Colorado Wolf Management

Working Group 2004; Bradley et al. 2015; DeCesare et al. 2018), which can be detrimental to the affected livestock operations (TWG 2022a). Three separate wolf depredation incidents on cattle were confirmed on a ranch in Jackson County, Colorado, between December 2021 and January 2022 (CPW 2021c, 2022d). See section 3.5 for a more detailed discussion of the socioeconomic impacts of depredation.

Habitat Preferences. Wolves are habitat generalists and can inhabit many types of ecosystems if sufficient prey populations are available, and they are able to spatially separate from humans to avoid conflict (Sazatornil et al. 2016; Mech 2017; Mech et al. 2019). Colorado has sufficient ecologically suitable habitat to sustain an ecologically functional wolf population (Carroll et al. 2006; Ditmer et al. 2022); however, the areas in Colorado with highest habitat suitability (e.g., the northern Western Slope) may also have the lowest human tolerance as a result of livestock grazing and agricultural activity on the land (Carroll et al. 2003; Ditmer et al. 2022). As stated in Colorado Revised Statute 33-2-105.8, reintroduction of wolves by the State of Colorado is proposed to occur west of the Continental Divide but it is expected that wolves would disperse east of the Continental Divide, into the plains and southeastern canyonland habitats (Ditmer et al. 2022).

Mortality. Wolf mortality may occur from natural causes or as a result of interactions with humans. Natural sources of mortality for wolves include inter- and intraspecific strife and natural causes (e.g., old age, disease, parasites, accidents; Colorado Wolf Management Working Group 2004; Murray et al. 2010). Wolves may be killed by other carnivores while competing for prey (Ballard et al. 2003) or from aggressive interactions with other wolves (Cubaynes et al. 2014). Gray wolves in Colorado are likely to be exposed to and affected by viral and bacterial diseases and parasites, including canine distemper, canine parvovirus, rabies, leptospirosis, tularemia, blastomycosis, heartworm, intestinal worms, echinococcosis, sarcoptic mange, lice, and ticks, similar to the rest of their range (Johnson et al. 1994; Brand et al. 1995; Mech et al. 2008; Michigan DNR 2015). In other wolf populations, these diseases and parasites are not considered limiting at the population level (Michigan DNR 2015). It can be difficult to assess the direct and indirect influences of diseases unless wolves are being closely monitored (Brand et al. 1995), but it is possible that a disease outbreak may affect dispersal and colonization of new areas if a high percentage of pups are infected (Mech et al. 2008).

Human-caused mortality typically accounts for more than 80 percent of all wolf mortality (Fuller 1989; Murray et al. 2010). The rate of illegal harvest of wolves is uncertain because unreported killing cannot be precisely quantified, and not all individual wolves in a population are monitored closely to determine cause of death. In Minnesota, 17 to 31 percent of wolf mortality was attributed to illegal human-caused mortality (Fuller et al. 2003), while a review of 21 studies across North America estimated 23 percent of mortalities of monitored wolves was due to illegal harvest (Hill et al. 2022). Depredation of livestock is a primary source of conflict, as is lack of tolerance of wolves in both the United States and Canada (Mech 2017; Morehouse et al. 2018). Areas with a high density of roads have negatively affected wolf persistence by increasing human access (Mladenoff et al. 1995; Kohn et al. 2001; Smith et al. 2010; Hebblewhite and Whittington 2020); the exception being if high road density is near large areas of intact wolf habitat with few or no roads, e.g., wilderness areas or national park units (Mech 1989). Wolf survival in areas of high road density is also affected by landscape features (terrain, topography, cover), traffic, road distribution, and human tolerance (USFWS 1994).

Wolf populations have demonstrated strong resilience to mortality because of the compensatory nature (see definition in Appendix A, Glossary) of natural and human-caused mortality factors and because of wolves' high reproductive potential (Fuller et al. 2003). The range of sustainable human-caused mortality rates varies due to biological and ecological conditions of specific habitats and wolf populations. Previous research in Minnesota and Alaska indicated that wolves could withstand human-caused mortality rates up to 28 percent before a population decline is detected (Fuller 1989; Adams et al. 2008), while modeling the effects of human-caused mortality on northern Rocky Mountain wolf population growth estimated a sustainable rate of 45 percent (Gude et al. 2012). In the final rule for removing wolves from the ESA, the Service identified the adaptable nature of the pack social

structure as enabling wolf populations to rapidly overcome pervasive human-caused mortality or disease (USFWS 2020b). Recruitment rate has been identified as an important variable in population-level responses of wolves to human-caused mortality (Gude et al. 2012).

Interactions with Other Species. Wolves may directly compete with other predators for prey or habitat, including coyote (*Canis latrans*), mountain lion (*Puma concolor*), black bear (*Ursus americanus*), lynx (*Lynx canadensis*), bobcat (*Lynx rufus*), and wolverine (*Gulo gulo*) (Ballard et al. 2001; Griffin et al. 2011; Forrester and Wittmer 2013; CPW 2022c). These predators may kill or be killed by wolves (Ballard et al. 2003; Kortello et al. 2007; Elbroch et al. 2020). In some areas where wolves have been restored, competitors have changed their predation habits or habitat selection to avoid competition with wolves (Smith et al. 2003). When wolves were reintroduced to Yellowstone National Park in 1995 after being absent for approximately 70 years, they were expected to compete with other predators, including coyotes, mountain lions, and grizzly bears for prey resources. In the absence of wolves during the preceding decades, these predators likely expanded their niche spaces and habitats to include spaces vacated by wolves (Ruth et al. 2011; Bartnick et al. 2013). Because elk and deer populations at Yellowstone were at or near all-time highs when wolves were reintroduced, prey resources were not limited, which likely buffered the effects of interspecific competition among predators in the short term.

Eventually, studies on interspecific competition between wolves and mountain lions following the natural recolonization and reintroduction of wolves to the northern Rocky Mountains documented behavioral changes in mountain lions due to the presence of wolves. Observed changes included avoidance behaviors, changes in prey selection, and shifts in space use (Bartnick et al. 2013). Between wolves and mountain lions, wolves tend to be the dominant predator, and mountain lions tend to avoid areas where wolves are present. With the increased presence of wolves, mountain lions shifted their habitat use to higher elevations and used other habitats farther removed from wolf home ranges and kill sites. In addition, mountain lions preyed on a higher proportion of mule deer, whereas elk had been their primary prey species in the absence of wolves. This shift in prey selection was likely a result of increased mountain lion-mule deer encounters as mountain lions shifted their habitat use to higher elevations (Bartnick et al. 2013). This interaction is known as competitive interference.

Competition between wolves and grizzly bears was also observed at Yellowstone following the reintroduction of wolves (Ballard et al. 2003; Gunther and Smith 2004). However, grizzly bears have been extirpated from Colorado (DMNS 2022).

Black bears occur throughout most of the western two-thirds of Colorado (CBI 2011a). Although they are omnivores, black bears are considered to be apex predators in some ecosystems. There have been fewer documented interactions between wolves and black bears compared to other predators. Wolves have been documented to kill black bears on occasion. In the majority of these cases, wolves have outnumbered black bears, giving them a competitive advantage in combat. Wolves were the more dominant species in approximately 70 percent of the documented wolf-black bear interactions (Ballard et al. 2003).

Complex interactions among wolves and coyotes have also been observed. Following reintroduction of wolves at Yellowstone, Merkle et al. (2009) observed wolf-coyote encounters over a 12-year period from 1995 to 2007. Wolves were observed to be the more dominant species in interactions with coyotes, with wolves initiating most encounters (Merkle et al. 2009). In most observed encounters, wolves chased coyotes away, but killed them in some encounters. Wolf-coyote interactions decreased over time as the size of the wolf population increased, suggesting that coyotes adapted to the presence of wolves by altering their behaviors or declined in number through dispersion (Merkle et al. 2009). Although wolves do not hunt coyotes as prey, coyotes are reported as the carnivore being most commonly killed by wolves, further demonstrating the need for coyotes to adapt their behaviors in the presence of wolves (Palomares and Caro 1999; Merkle et al. 2009). However, coyotes also benefit from the access to carrion left behind at wolf kill sites (Ballard et al. 2003; Merkle et al. 2009; NPS 2022a). Interspecific competition has not yet been documented with wolves and other predators in Colorado.

Wolf Recovery and Potential Ecosystem Response. As noted above, wolves have been reintroduced or naturally recolonized portions of their historic North American range. Notable examples of reintroduction include Yellowstone National Park and central Idaho (USFWS 1994), whereas natural recolonization occurred in northern Wisconsin (Callan et al. 2013), Isle Royale National Park in Michigan (McLaren and Peterson 1994; except for reintroductions that began in 2020 [NPS 2018]), and Banff National Park in Alberta, Canada (Hebblewhite et al. 2005). The following discussion provides an overview of the role of wolves in ecosystems and describes ecosystem-level effects that have been documented elsewhere following reintroduction and recovery efforts. It should be noted that ecosystem response to wolf reintroduction can vary greatly among regions and ecosystems depending on biotic and abiotic factors and complex interactions.

As an apex predator, wolves may exert a strong top-down influence on the trophic structure of the ecosystems they inhabit (Ripple and Beschta 2012). This means that wolves may influence ecosystem structure either directly (e.g., predation) or indirectly (e.g., behavioral modification of prey species and mesocarnivores [predators that occupy mid-levels of food webs]) by altering herbivore abundance and/or distribution on the landscape. This can, in turn, positively or negatively influence vegetation communities and drive ecosystem structure, although most research indicates positive changes related to the effects of wolves (Estes et al. 2011; Ripple and Beschta 2012; Ripple et al. 2014). This process is known as a trophic cascade. Although there are documented examples of trophic cascades across a diversity of ecosystems, they are a topic of debate in the body of scientific literature because of the many variables and complex interactions that can otherwise affect ecosystem structure (Mech 2012; Smith et al. 2019).

Since 1995, when wolves were reintroduced to Yellowstone National Park, changes have been documented that have resulted in improved habitat conditions, including a resurgence of woody browse species such as willow (*Salix* spp.), aspen (*Populus tremuloides*), and cottonwood (*Populus* spp.) in some areas (Smith et al. 2003; Hollenbeck and Ripple 2007; Ripple and Beschta 2012). An increase in the abundance and diversity of riparian bird species in portions of Yellowstone National Park was observed during the same period (Smith et al. 2003; Hollenbeck and Ripple 2007). However, the exact mechanisms and the role that wolves have played in contributing to these changes continues to be debated (Mech 2012; Smith et al. 2019). Changes in ecosystem structure and dynamics following reintroduction or natural recolonization of wolves have been observed in other ecosystems throughout North America including northern Wisconsin (Callan et al. 2013), Isle Royale National Park in Michigan (McLaren and Peterson 1994; NPS 2018), and at Canada's Banff National Park in Alberta (Hebblewhite et al. 2005).

3.2.2 Other Federally Listed Species

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

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

Table 3-3. Other 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 focal counties.
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 focal counties.
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 historical range.	Mexican wolf does not occur in Colorado but is present 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 focal counties.
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 focal counties, 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 focal counties 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 focal counties 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 focal counties 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 focal counties.
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 focal counties.
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 focal counties, 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 focal counties.

Source: USFWS 2022c,d

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 focal counties 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 focal counties 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 focal counties 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 focal counties 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 focal counties 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 focal counties in Mesa and Delta Counties.

Source: USFWS 2022c,d

3.2.3 State-Listed Species

Seventy-four species are listed as endangered or threatened 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. Some federally listed species occurring in Colorado are also listed at the State level. 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 21 focal counties include 3 amphibians, 14 birds, 10 mammals, 4 reptiles, 20 fishes, and 1 mollusk. State-listed and other SGCN that could occur in the focal counties, 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. Other State-Listed Species in the Focal Counties

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

Source: CPW 2015

3.3 OTHER WILDLIFE SPECIES

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

3.3.1 Elk and Deer

Elk, mule deer, and white-tailed deer are the primary prey species for wolves in the northern Rocky Mountains (Smith et al. 2004). At Yellowstone National Park in Wyoming and in portions of Montana and Idaho, NPS (2022b) reports that elk comprise up to 90 percent of the diet of wolves during winter months. Elk and deer are abundant in Colorado. Based on the most recent population estimates (2021), Colorado's statewide elk population was 308,901 (CPW 2021a) and the statewide deer population was 416,426 (CPW 2021b). Mule deer populations in portions of western Colorado have been in decline since the 1970s as a result of loss and alteration of habitat and migration routes, competition from elk, disease, predation, and hunting pressure (Bergman et al. 2015; CPW

Deleted: most critical

2020b). Among prey species preferred by wolves, elk and deer are also the species with the highest densities in Colorado (Colorado Wolf Management Working Group 2004).

Elk and deer travel in herds and use a variety of habitats throughout the state. The density of these species in a given location changes seasonally based on environmental conditions and food availability (Singleton 1995, as cited in Ditmer et al. 2022). Snow cover is a driver of seasonal elk and deer movement in Colorado because they seek out areas with less snow cover that provide better access to vegetation (Paquet et al. 1996, as cited in Ditmer et al. 2022). Modeling has shown that the density of elk and mule deer is highest in the Western Slope region of Colorado, north of Interstate 70 during summer and winter. This contributes to the high suitability of northwestern Colorado for wolf reintroduction (Ditmer et al. 2022).

3.3.2 Other Ungulates

Wolves also prey upon a variety of other ungulates, such as pronghorn and wild sheep (*Ovis* spp.), and even large animals such as bison (*Bison bison*), moose, and wild horses. Bison are an important source of prey for wolves in the northern Rocky Mountains despite being more difficult to kill than other prey (Smith et al. 2000, MacNulty et al. 2014). However, introduced bison in Colorado are in contained areas and are currently managed in the state as livestock, rather than wildlife. No immediate plans are in place to reintroduce free-roaming bison in Colorado. Bison are not expected to be a significant prey source for gray wolves in Colorado; therefore, impacts on bison are not discussed in detail in this EIS.

Wolf predation on pronghorn at Yellowstone National Park has been closely documented for decades, but overall predation rates have been low (Barnowe-Meyer et al. 2009). The range of pronghorn in Colorado is more expansive in the Eastern Plains region; however, pronghorn also occur in limited portions of the Western Slope including northwestern Colorado (CBI 2011b). Although their population has been steadily increasing in recent decades, pronghorn are considerably less abundant in Colorado than elk and deer with an estimated statewide population of 78,182 in 2021 (CPW 2021d).

Wolves are known to prey on moose, particularly calves, in areas where their ranges overlap (McLaren and Peterson 1994; Messier 1994; Jost et al. 2005). In some areas, such as boreal and taiga forests or in closed systems like Michigan's Isle Royale National Park, moose are primary prey for wolves (Seip 1992; Messier 1994; Jost et al. 2005). In other areas, such as Yellowstone National Park, moose are secondary prey for wolves (Smith et al. 2003; Metz et al. 2012). Moose were rarely observed in Colorado until the late 1970s when CPW transplanted moose from Utah and Wyoming to the North Park region near Walden. Moose are less abundant than most other prey species in Colorado. Colorado's statewide moose population was estimated at 3,505 in 2021, and CPW manages them as a game species (CPW 2021e). Moose distribution in Colorado is concentrated in the northern portion of the Front Range and along the Western Slope, including northwestern Colorado (CBI 2011c).

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

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

In parts of Europe and Asia, wolves have been reported to prey on wild horses (Van Duyne et al. 2009; Dorj and Namkhai 2013; López-Bao et al. 2013). However, wolves tend to target wild horses when preferred prey resources (e.g., smaller ungulates) are depleted (Van Duyne et al. 2009), which is not the case in Colorado.

3.4 TRIBAL CULTURAL RESOURCES

Various Native American groups have occupied western Colorado for at least the last 12,000 years. Historical records indicate that the Ute were the primary occupants of Colorado west of the Continental Divide, but several other Tribes also lived in the area; table 1 in Appendix F provides a list of the Tribes associated with the various regions of Colorado. A detailed history of occupation is also provided in Appendix F. The affected environment for Tribal cultural resources focuses on archaeological and historical sites and natural resources of importance to the Tribes located in the focal counties for analysis (figure 2-1) that could be impacted by a regulatory framework, as well as Tribal treaty rights pertaining to hunting and for reservations. Government-to-government consultation occurred throughout development of the EIS (as documented in Chapter 5), and this section was informed by input from Tribes during consultation and in their comments on the draft EIS.

3.4.1 Archaeological and Historical Sites

As shown in Appendix F, a review of the Colorado Office of Archaeological and Historic Preservation (OAHP) Compass database identified 2,106 archaeological and historical sites associated with known Native American Tribes within the focal counties. Of these, 952 are eligible for the National Register of Historic Places. These sites preserve important elements of Native American history and culture and/or have the potential to yield more information about their history through further research.

Appendix F includes a summary of the types of sites (e.g., prehistoric or historic and habitation, architectural, rock art) by county. In addition, table 2 in Appendix F identifies the approximate number of sites associated with known Colorado Tribes by county. The review of the OAHP database reflects the information available at the time of the review and accounts for the best available data for archaeological and historical sites information. However, the review may not be complete due to the limitations of the OAHP database, such as a delay in entries and/or updates causing some information to be outdated. As noted in Appendix F, the OAHP database is sometimes up to five or more years outdated but represents the best available data at the time of publication of this final EIS.

3.4.2 Natural Resources of Cultural Importance

Natural resources of cultural importance include wildlife within the state of Colorado. For example, the Ute Mountain Ute Tribe, Southern Ute Indian Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation honor the bear in the bear dance (Southern Ute Indian Tribe 2022; Steward 1932; see Appendix F). The bear dance was derived from a story in which two men witnessed a bear dancing while they were hunting. The story noted that the bear taught the men to dance, along with a corresponding song. The bear also instructed the men to teach the dance and song to their people. The bear is believed to be one of the wisest animals and one that has magical powers. The Southern Ute, for instance, believe that bears understand the relationship with the Ute and that the dance solidifies this relationship (Anaya 2010).

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

3.4.3 Tribal Treaty Rights and Reservations

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

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

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

Over time, however, the Ute territory, along with the territories of other Tribes, was greatly reduced by actions of the U.S. government, growing trade requirements, and American settlement, particularly following the transfer of Alta California, after the Mexican-American War (1846–1848). Following these events, for instance, numerous treaties and agreements between the Ute and the U.S. government were established. Among these are the Calhoun Treaty, signed in 1849; the Hunt Treaty of 1868, also known as the Treaty with the Ute, 1868; and the Brunot Agreement, initiated in 1874. These treaties and agreements resulted in land cessions and constraints on the traditional practices of the Ute, as well as establishing reservations (figure 3-2).

In Colorado, the Southern Ute Indian Tribe and the Ute Mountain Ute Tribe each have a reservation. Reservations refer to “land reserved for a tribe (or multiple Tribes) under treaty, statute, or other agreement with the United States that establishes permanent Tribal homelands” (Fitzpatrick 2021). The Ute Mountain Ute also manage Tribally owned lands near Gunnison, Colorado. Appendix F provides a discussion of these and other treaties and agreements between the Ute and U.S. government.

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

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

In Colorado, wildlife conservation is subject to the jurisdiction of the Southern Ute Indian Tribe on their reservation. Wildlife on the reservation is considered property of the Tribe, unless privately owned (Ayala 2010). “Southern Ute Tribal members may hunt any type of wildlife not limited by regulation, i.e., big game, at any time without a license or permit” (Ayala 2010). The Ute Mountain Ute operate a wildlife management program and provide for protection and utilization of hunting rights, including those as part of the Brunot Agreement (Ute Mountain Ute Tribe 2020).



Figure 3-2. Boundaries of the Southern Ute Indian Tribe and Ute Mountain Ute Tribe Reservations

3.4.4 Government-to-Government Consultation

As of June 2023, the Southern Ute Indian Tribe, Ute Mountain Ute, Navajo Nation, and Pawnee Nation have requested government-to-government consultation with the Service. CPW has been engaged in ongoing Tribal consultations with the Southern Ute Indian Tribe and Ute Mountain Ute Tribe, the two Tribes with sovereign lands within Colorado’s borders (see Chapter 5, below; Keystone Policy Center 2022).

The Southern Ute Indian Tribe and Ute Mountain Ute Tribe have expressed concern for the release of gray wolves in southern Colorado, particularly within the Brunot Area and in areas near reservation lands or fee lands owned

by the Tribes (Boyd n.d.; Schaaf 2022; Heart 2023). These concerns are related to potential impacts associated with ranching and hunting traditions and resources (Boyd n.d.; Baker 2023).

A similar sentiment was expressed for the recovery of wolves in the State of Utah and made to the Utah Division of Wildlife Resources by the Uintah and Ouray Tribal Business Committee under authority of the Constitution and By-Laws of the Ute Indian Tribe in 2003. The Tribe “encourage[d] the United States Fish & Wildlife Service to reject any request to establish additional wolf recovery areas within the State of Utah, particularly areas encompassed by the Uintah and Ouray Reservation” (Utah Division of Wildlife Resources 2018). The Tribe noted the potential for impacts to the Tribe’s wildlife management efforts, wildlife populations on their reservation, subsistence hunting, and the livestock and ranching industry (Utah Division of Wildlife Resources 2018).

3.5 SOCIOECONOMIC RESOURCES

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

3.5.1 Human Activity in Colorado

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

Population

Table 3-6 provides the population counts for the state of Colorado and for the 21 focal counties. Between 2010 and 2020, the human population of the 21 counties grew by 10.96 percent from 822,554 to 912,734 people, making up 15.8 percent of the state’s total population in 2020 (U.S. Census Bureau 2020). By comparison, the population of Colorado grew by 14.8 percent from 5,029,196 to 5,773,714 people in that same period. The 21 counties are more sparsely populated than the state as a whole, as shown in table 3-6. Most of the population in these 21 counties lives in communities centered around ski and mountain resorts or towns along major highways such as Interstate 70. Table 3-7 shows population density.

Table 3-6. Population Summary

Geographic Area	2010	2020	% Change 2010–2020	Most Populous City/Town (2020 Population)
Colorado	5,029,196	5,773,714	14.80%	Denver (715,522)
21 Focal Counties	822,584	912,734	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)

Geographic Area	2010	2020	% Change 2010–2020	Most Populous City/Town (2020 Population)
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)

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

Table 3-7. Land Use Summary

Geographic Area	Land Area (mi ²)	2020 Population Density (pop/mi ²)
Colorado	104,177	55.42
21 Focal Counties	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

Geographic Area	Land Area (mi ²)	2020 Population Density (pop/mi ²)
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

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

Employment

Saguache County has the highest unemployment rate of the 21 focal counties at 9.80 percent, while Dolores County has the lowest unemployment rate at 2.00 percent. Saguache, Rio Blanco, and Grand Counties all have unemployment rates higher than the state as a whole. Huerfano County has the highest poverty rate of the focal counties, at 19.90 percent; Saguache County has the second highest poverty rate. Twelve focal counties have poverty rates above Colorado's poverty rate of 9.8 percent. On average, the poverty rate across the 21 focal counties is 11.04 percent, higher than the state's poverty rate (U.S. Census Bureau 2022).

Table 3-8 shows employment and income characteristics for the 21 counties—all of which have an unemployment rate lower than the overall Colorado unemployment rate of 4.6 percent, except for Grand, Rio Blanco, Routt, and Saguache Counties. Eagle County has the highest median household income which is \$85,877 while Huerfano County has the lowest median household income, which is \$40,255.

Table 3-8. Employment Summary

Geographic Area	Unemployment Rate	Poverty Rate	Median Household Income	Percent Employed in Tourism and Recreation-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%

Geographic Area	Unemployment Rate	Poverty Rate	Median Household Income	Percent Employed in Tourism and Recreation-Related Sectors
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%

Source: American Community Survey 2016-2020

According to U.S. Census Bureau data, the primary industries in the 21 focal counties are in the tourism and recreation-related sector of Arts, Entertainment, Recreation, Accommodation, and Food Services; and Educational Services, Health Care, and Social Assistance (U.S. Census Bureau 2022).

3.5.2 Industry Sectors in Colorado

Tourism

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

As of December 2022, a group of two wolves resided in Jackson County, one of the focal counties. Because the wolves were found in Jackson County relatively recently, no data are available on the economic impacts of these wolves on tourism or other sectors of the county’s economy. Jackson County describes itself as “the Moose Viewing Capital of Colorado,” and tourism associated with wildlife viewing in the Arapaho National Wildlife Refuge and the North Park Basin contributes to the local economy (Jackson County n.d.).

Outdoor Recreation

According to data from the Bureau of Economic Analysis, outdoor recreation contributed \$12.2 billion and 149,000 jobs to Colorado in 2019, and \$9.6 billion and 120,000 jobs in 2020. For comparison, the economic output of outdoor recreation activities nationwide was \$834 billion in 2019 and \$689 billion in 2020, with 5.2 million jobs in 2019 and 4.3 million jobs in 2020 (Office of Economic Development and International Trade 2021). CPW estimated the economic contributions of activities associated with outdoor recreation to be

significantly greater, representing \$62.5 billion and 511,059 jobs across the entire state in 2017—\$14.9 billion and 133,658 of these jobs were in the northwest region of the state, which includes multiple focal counties (CPW 2018).

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

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

Agriculture and Livestock Grazing

Table 3-9 provides 2019 U.S. Department of Agriculture (USDA) data on the numbers of farms and farm workers in each of the focal counties, as well as in the entire state of Colorado. The proportion of people who work on farms in the 21 focal counties is roughly twice that of the state of Colorado, with particularly high proportions of farm workers in Dolores, Jackson, Custer, and Huerfano Counties. Table 3-10 provides an economic summary of agricultural production in each of the 21 focal counties and the state of Colorado, including total agricultural sales and the average per farm net income. Saguache County has the highest average per farm net income followed by Jackson County, both of which are greater than the state. Huerfano, La Plata, Routt, and Archuleta Counties have negative average farm incomes.

Table 3-9. Agricultural Summary (2019)

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 Focal Counties	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
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

Geographic Area	Number of Farms	Number of Farm Workers	Farm Workers (% of Population)	Average Farm Area (Acres)
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

Source: USDA 2019

Table 3-10. Agricultural Economic Summary (2019)

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
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

Source: USDA 2019

According to USDA data, most livestock losses nationally, including in Colorado and the states used as geographies of comparison in the Chapter 4 analysis (i.e., Oregon, Washington, and Wyoming), are due to nonpredator causes. Data on livestock inventory and loss are shown below in table 3-11 and table 3-12. Most nonpredator cattle deaths in Colorado are caused by respiratory (33.6 percent) or digestive problems (20.8 percent) (USDA 2017). Most predator-caused cattle deaths in Colorado are from coyotes (68.6 percent), with bears as the second-most common cause (15.0 percent). Leading causes of nonpredator sheep and lamb deaths in Colorado include old age (11.0 percent), respiratory problems (10.9 percent), and enterotoxemia/overeating (9.2 percent). Most predator-caused sheep and lamb deaths in Colorado are from coyotes (59.6 percent) and bears (26.0 percent) (USDA 2015).

Table 3-11. Statewide Cattle Inventory and Loss Summary*

	Colorado	Oregon	Washington	Wyoming
Cattle Inventory (2017)	2,812,306	1,243,916	1,155,544	1,308,867
Number of Dairy Cows (2017)	169,423	128,284	276,914	5,719
Number of Cattle on Feed (2017)	1,005,237	92,407	217,509	72,128
Cattle on range (Non-dairy, Non-feed) (2017)	1,637,646	1,023,225	661,121	1,231,020
Total Cattle Deaths (2015)	115,000	61,000	44,000	39,000
Cattle Deaths from All Predators (2015)	5,080	7,530	1,280	3,400
Percent of Cattle Deaths from Predators (2015)	4.4%	12.3%	2.9%	8.7%
Value of Total Cattle Loss (2015)	\$113,291,000	\$56,270,000	\$41,537,000	\$27,327,000
Value of Total Cattle Loss (Inflation-adjusted to 2023)	\$145,012,480	\$72,025,600	\$53,167,360	\$34,978,560
Value of Cattle Loss from Predators (2015)	\$3,079,807	\$5,347,779	\$580,503	\$1,836,987
Value of Cattle Loss from Predators (inflation-adjusted to 2023)	\$3,942,153	\$6,845,157	\$743,044	\$2,351,343

Source: USDA 2017, 2019

*Cattle inventory data are from the 2017 Census of Agriculture (USDA 2019), while full data on the numbers, causes, and value of cattle loss were most recently published by the USDA for 2015 (USDA 2017).

Table 3-12. Statewide Sheep Inventory and Loss Summary*

	Colorado	Oregon	Washington	Wyoming
Sheep Inventory (2017)	414,672	177,646	52,329	367,702
Total Sheep Deaths (2015)	29,000	15,000	5,000	16,000
Sheep Deaths from All Predators (2015)	12,654	6,139	1,445	7,400
Percent of Sheep Deaths from Predators (2015)	43.6%	40.9%	28.9%	46.3%
Value of Total Sheep Loss (2015)	\$5,850,000	\$2,526,000	\$1,037,000	\$2,723,000
Value of Total Sheep Loss (Inflation-adjusted to 2023)	\$7,488,000	\$3,233,280	\$1,327,360	\$3,485,440
Value of Sheep Loss from Predators (2015)	\$2,556,500	\$990,000	\$298,000	\$1,122,900
Value of Sheep Loss from Predators (Inflation-adjusted to 2023)	\$3,272,320	\$1,267,200	\$381,440	\$1,437,312

Source: USDA 2015, 2019

*Sheep inventory data are from the 2017 Census of Agriculture (USDA 2019), while full data on the numbers, causes, and value of sheep loss were most recently published by the USDA for 2015 (USDA 2015).

Although predators are responsible for the minority of sheep and lamb deaths and an even smaller proportion of cattle and calf deaths, the costs of predator-caused livestock losses and implementation of predator control methods can be a financial burden for operators. The figures in the tables above do not include other costs that livestock producers incur as a result of predator attacks, such as livestock that are injured but not killed, damage to property, or reduced livestock value from predator-induced stress.

Commented [DT9]: Especially in localized situations in areas of repeated/chronic depredation (more specific to wolves and grizzly bears)

3.6 ENVIRONMENTAL JUSTICE

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

3.6.1 Methodology

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

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

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

Minority environmental justice communities were identified using both the 50 percent and “meaningfully greater” analyses. If the aggregate minority population (including all minority and Hispanic or Latino individuals) in a county exceeded 50 percent of the total population, an environmental justice community was identified in that county. When the majority of the population in a given geographic area identifies as a race other than white or as

Hispanic or Latino, that population is classified as a “majority-minority” population. Separately, the “meaningfully greater” analysis requires use of a reasonable, subjective threshold (e.g., 5 percent or 10 percent greater than the reference community). What constitutes “meaningfully greater” varies by agency (Federal Interagency Working Group on Environmental Justice & NEPA Committee 2016). For this analysis, the Service has defined “meaningfully greater” as a minority population that exceeds the minority population in the reference community (i.e., the state of Colorado) by more than 5 percent. This threshold is large enough to take into account natural variations in demographic populations within a community.

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

3.6.2 Existing Conditions

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

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

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

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

In 2020, 9.8 percent of individuals in Colorado had incomes below the poverty line. Of the 64 counties in the state, 41 (or approximately two-thirds) had percentages of individuals living below the poverty line that were

greater than the percentage at the state level, including 12 of the focal counties. Low-income environmental justice communities have been identified in these counties. These counties are located across the state in both urban and rural areas. In most, but not all cases, counties with meaningfully greater minority populations also had higher percentages of low-income individuals than the state.

Environmental justice communities identified in the statewide study area and focal counties are listed in table 3-13 and shown in figures 3-3 and 3-4. Minority and low-income populations meeting the criteria for environmental justice communities as discussed above are bolded in table 3-13. Highlighted rows represent focal counties, and bold text indicates an environmental justice community.

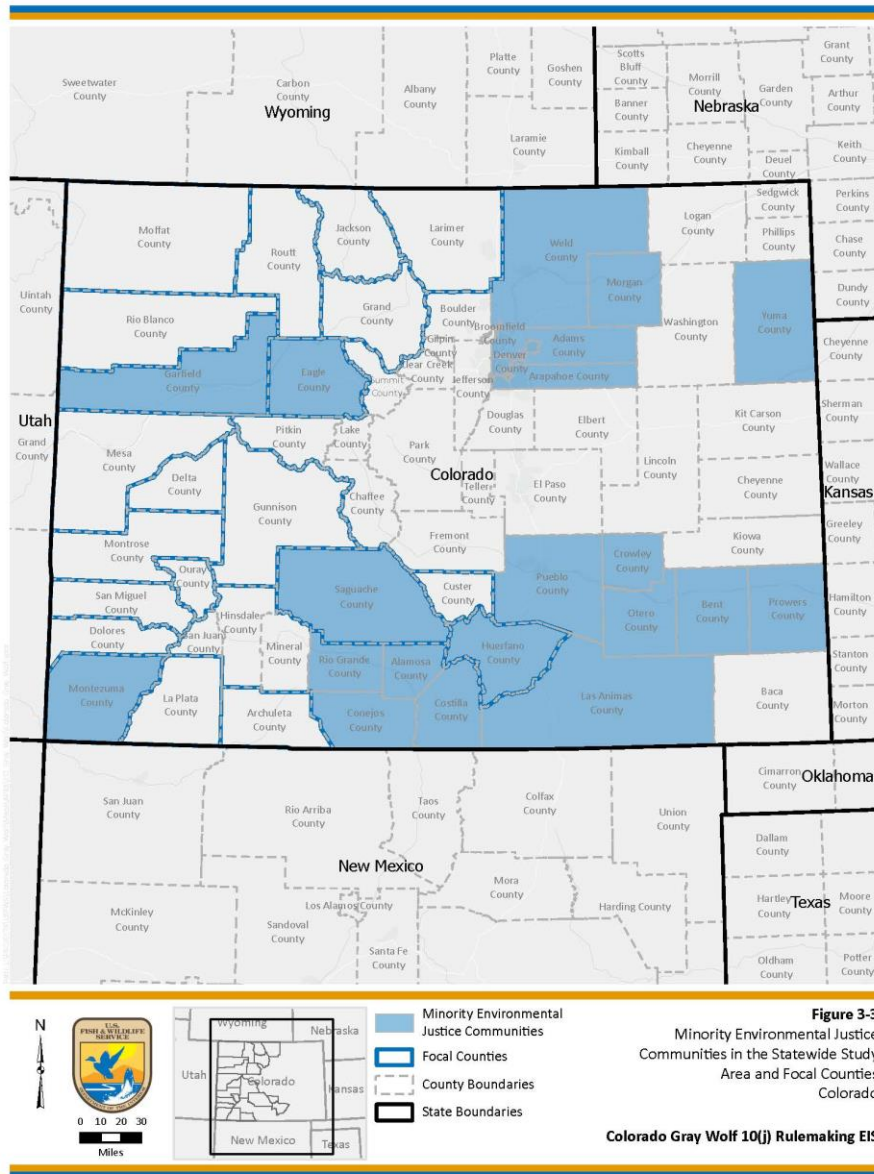
Table 313. Environmental Justice Communities in Colorado and the Focal Counties

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

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		
Fremont County	3.7	1.4	0.7	< 0.1	0.5	4.3	12.4	22.9	13.2
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

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		
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
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

Source: U.S. Census Bureau 2020a–d



Low-income and minority individuals employed in livestock production or as outfitters or guides are addressed in this environmental justice analysis as specific population groups of concern. Demographic and income data for livestock producers in Colorado were obtained from the 2017 USDA Census of Agriculture (see table 3-14). The Census of Agriculture collects data on all agricultural producers in the state, including producers of row crops, field crops, and livestock. Table 3-14 includes data on all agricultural producers in the study area and is used as a conservative proxy for data on livestock producers. Demographic and income data specific to livestock producers were not publicly available as of the time of publication of this final EIS. Highlighted rows represent focal counties and bold text indicates an environmental justice community.

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

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

Table 314. 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
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

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)
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

Source: USDA 2019

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

Demographic and income data for outfitters and guides were not available publicly, through the state of Colorado, or from other cooperating agencies at the time of publication of this final EIS. Therefore, the impacts analysis for this population group of concern in Chapter 4 is qualitative, based on the lack of available information.

All American Indian Tribes are also considered population groups of concern for environmental justice. One county with an American Indian environmental justice community, Montezuma County, has been identified based on the data shown in table 3-13. Section 3.4 identifies American Indian Tribes with Tribal trust land within the study area and Tribes that have asked to be consulted during the NEPA process, including the Ute Mountain Ute, Southern Ute, and Pawnee Nation. These Tribes or their members are engaged in livestock production and hunting and could potentially be affected by the proposed action and alternatives, including the no-action alternative. Section 3.4 and Chapter 5 provide additional discussion of consultation with these American Indian Tribes and identified concerns.

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. In compliance with NEPA (40 CFR 1502.16) and as required by CEQ regulations implementing NEPA, this chapter compares 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 the implementation of a regulatory framework 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 the implementation of a regulatory framework is 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 accompany the State of 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. The environmental baseline for analysis of impacts assumes that the State of Colorado has reintroduced gray wolves in accordance with Colorado Revised Statute 33-2-105.8. Issues related to the reintroduction process, including whether reintroduction should 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 (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

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

4.3.2 Assumptions

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

Analysis Period. This EIS establishes what management tools would be available under a regulatory framework to address the State of Colorado’s plan to reintroduce the gray wolf. For all action alternatives, it is assumed that the need for regulatory flexibility would be less in the initial reintroduction phases and increase as populations become established. Short- and long-term impacts are defined under each resource area, but in general, short-term impacts are expected in the first three to five years of reintroduction activities and long-term impacts would be five years and beyond. Management under the federal regulatory framework may continue while the species is federally listed without additional NEPA analysis as long as there no “substantial changes in the proposed action that are relevant to environmental concerns; or ... significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts” (40 CFR 1502.9(c)). If the species is federally delisted, the State would manage gray wolves in Colorado.

Analysis Area. The area of analysis generally focuses on the state of Colorado. For the action alternatives (alternatives 1 and 2) focal counties are identified that are assumed to have suitable habitat for potential release locations or locations wolves may migrate to after release based on the 2022 study by Ditmer et al. These focal counties are identified in Chapter 2, figures 2-1 and 2-2.

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

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

4.3.3 Jurisdiction and Compliance

The Service is the lead agency for this planning process, whereas NPS, the Bureau of Land Management, the U.S. Forest Service, USDA-Animal and Plant Health Inspection Service’s Wildlife Services, CPW, State of Colorado Department of Agriculture, State of Utah, State of Arizona, State of New Mexico, State of Wyoming, Moffat County, Garfield County, Delta County, Mesa County, Jackson County, Montrose County, Delores County, Grand County, Rio Blanco County, and the White River and Douglas Creek Conservation Districts are

participating as cooperating agencies. The Service has jurisdiction over the implementation of the ESA, including the conservation of listed species such as the gray wolf.

4.4 SPECIES OF SPECIAL CONCERN

4.4.1 Gray Wolf

The following analysis considers the environmental consequences of the management options being considered under section 10 of the ESA for the wolf population following the reintroduction of wolves in Colorado. The environmental consequences were evaluated by assuming each alternative would be implemented starting in 2023, when wolves are reintroduced by the State (as per commitments in Colorado Revised Statute 33-2-105.8). In all alternatives, it is anticipated that wolves would be reintroduced in a phased approach over several years (TWG 2022b); as such, wolf numbers and distribution are expected to increase over time.

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

In all alternatives assessed in this EIS, the reintroduction of wolves in Colorado and subsequent ability for the wolf population to grow in numbers and distribution would be highly affected by their interactions with humans. Social tolerance is fundamental for any predator reintroduction, and the relationships between predators and land users is complex (Dickman 2010; Murray et al. 2010; Mech 2017; Pooley et al. 2017; Morehouse et al. 2018). Indeed, Congress made the section 10(j) amendment to the ESA in 1982 because prior to that, efforts to reintroduce endangered species were often met with public resistance. CPW identified social tolerance for wolves and economic impacts of their presence in the state as the most significant key elements for the future of wolf conservation and management in Colorado (CPW 2023a). The region of Colorado where wolves may be naturally reestablishing, and the proposed reintroduction areas, are working landscapes, meaning agricultural and ranching operations are an integral part of the landscape. An analysis by Ditmer et al. (2022) demonstrated that although the northern Western Slope of the state contains high ecological suitable habitat for wolves, the area has low socio-ecological suitability because of high risk of human conflict. There is high potential for controversy surrounding wolf conservation and management in Colorado if human interests and needs are not being addressed. Illegal take, which is likely to occur under all alternatives, would affect the wolf population in both the short and long term. An analysis of the social implications of each alternative, including a discussion of the impacts regarding management flexibility, or lack thereof, following livestock depredations, is included in section 4.7. The following analysis is focused only on the biological aspects of wolf population and distribution under each alternative.

No-Action Alternative

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

Wolf Numbers and Distribution

Under the no-action alternative, wolf numbers and distribution would increase in the short term as wolves are reintroduced to the state. The state and federal governments would have no authority for lethal control, except in cases of human safety. At a local level, ungulates could decline in the short term in response to increased predation rates, which could limit wolf population growth if there was insufficient prey. In the long term, it is likely the ungulate populations would stabilize (due to natural fluctuations; Smith et al. 2003) and be able to support a self-sustaining population of wolves indefinitely. Adult wolf survival rates are expected to be similar to pre-harvest years in Minnesota (0.79; Barber-Meyer et al. 2021) and in the Yellowstone area (0.7 to 0.8; Cubaynes et al. 2014; Smith et al. 2020); although year-to-year variation is expected based on research following other reintroduced and naturally recolonizing populations elsewhere in the United States (Smith et al. 2020; Barber-Meyer et al. 2021).

Illegal killing is expected to be higher under the no-action alternative than under the action alternatives based on studies completed elsewhere, particularly in the short term after wolves are reintroduced when there is uncertainty about the potential adverse impacts on local land users. Olson et al. (2015) demonstrated that illegal killing of radio-collared wolves in Wisconsin increased in years when wolves were listed as endangered compared to years when they could be managed by the state. Federal managers in the northern Rocky Mountains estimated that around 10 percent of the known wolf population was illegally killed annually during wolf recovery, second only to lethal control to resolve wolf conflicts with livestock. Studies estimated that illegal take accounted for 24 percent of all mortalities in the northern Rocky Mountains (annually removing approximately 6 percent of the known population); however, 12 percent of all documented mortalities were attributed to unknown causes, so it is highly plausible that the number of wolves illegally taken may have been higher (Smith et al. 2010; Treves et al. 2017b). Although some researchers have documented that rates of illegal take are grossly underestimated because a high proportion of this type of mortality is undocumented (Liberg et al. 2012; Treves et al. 2017a,b), multiple other studies have supported the estimate that between 5 and 12 percent of wolves may be illegally killed annually in different areas of the conterminous United States (Murray et al. 2010; Smith et al. 2010; O'Neil 2017; Ausband et al. 2017; Stenglein et al. 2018; Barber-Meyer et al. 2021). If illegal take is greater than documented in other populations, the impact on the size and distribution of wolves in Colorado would be detrimental in the short and long term (Liberg et al. 2012). If illegal take is lower than documented in other populations, it is expected that in the long term, the wolf population would increase at rates similar to other established populations (i.e., 20 percent per year; Fuller et al. 2003), but may vary due to the population limiting factors discussed in section 3.2.1.

Wolf Habitat and Connectivity

In the long term, it is likely that individual wolves from other populations would continue to disperse into Colorado and may naturally establish packs with the reintroduced wolves and other dispersers. Any wolves that enter Colorado would be protected as an endangered species under the no-action alternative, regardless of their designation in the jurisdiction from which they originated. This would increase the population of wolves in Colorado and contribute to the long-term conservation and recovery of the gray wolf in the western United States.

This alternative is expected to be the most beneficial for wolves from a purely biological standpoint because it would limit any take on wolves that are reintroduced or that disperse naturally into the state. However, illegal human-caused mortality may be highest under this alternative (Olson et al. 2015). Flexibility by state and federal governments to respond to conflicts would be constrained because every wolf would be considered endangered and may decrease social tolerance of reintroduction. The population of wolves is expected to increase in growth and distribution in those areas where habitat suitability is high (i.e., where there is sufficient wild prey and limited contact with humans).

Commented [DT10]: "legal" human-caused mortality may be high as well. When wolves were relisted in WY in 2014 the following years saw the highest level of agency removal as a direct response to livestock depredation due to the increased wolf population and subsequent increased depredation.

Alternative 1

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

Wolf Numbers and Distribution

Under alternative 1, wolf numbers and distribution could be impeded in the short term during the initial reintroduction effort when fewer wolves are on the landscape. The potential loss (under allowable take provisions) of a small number of individuals would have a bigger impact on the total population and could delay the establishment a self-sustaining population of wolves (TWG 2021). Wolf numbers in Colorado during the first five years are likely to be similar to reported wolf numbers in Oregon (average of 37 wolves in 2009–2013) and Washington (average of 27 wolves in 2008–2012) (Oregon DFW 2022; Washington DFW et al. 2022). Lethal control actions in Colorado are likewise anticipated to be similar to Oregon and Washington, during their respective initial monitoring years, where 3 percent and 2 percent, respectively, of the known wolf populations were lethally controlled. In the long term, the allowable take provisions under alternative 1 would be unlikely to reduce the number of wolves in Colorado because wolf populations are able to sustain relatively high rates of human-caused mortality (see section 3.2.1 for discussion on mortality), and depredations that result in lethal control occur over a relatively small area compared to the entire wolf range and involve fewer packs than the total that exist on the landscape.

Nonlethal take actions allowed under alternative 1, including harassment/deterrence actions and capture and relocation, could be implemented as an alternative to lethal take in circumstances where individual wolves are in conflict with livestock production on private and public land (i.e., repeated depredations). Nonlethal take could potentially affect wolves' ability to reproduce and increase the population if wolves are unable to establish territories or find mates because they are harassed/deterred away from areas with suitable habitat and prey. However, it is unlikely that a reintroduced wolf that is disturbed via nonlethal take (e.g., deterrents, capture and translocation) would have reduced survival or inability to breed because wolves are highly adaptable and resilient (Ginsberg and Macdonald 1990), and the management flexibility to implement nonlethal actions may improve wolf survival overall under this alternative (McManus et al. 2015; Bruns et al. 2020). However, if wolves are deterred or relocated to an area in Colorado where the risk of mortality is higher (because they come into conflict with other established wolf packs), or if they disperse outside the state of Colorado, then there would be negative implications to the establishment of a population in the state (TWG 2022b). The provision to allow nonlethal and lethal take of wolves to reduce impacts to ungulate populations limited to Tribal reservation lands of the Ute Mountain Ute Tribe and Southern Ute Indian Tribe could have adverse impacts on individual wolves as a result of lethal control or relocation, but these instances would be limited due to the limited scope of the provision. Lethal take under these circumstances would need to meet the requirements noted in table 2-2 before take would be authorized. Take of wolves under these circumstances is expected to occur rarely and would not have population-level effects on the species in Colorado.

In the long term, it is not expected that allowable take under alternative 1 would have a measurable impact on the population. Over time, the wolf population in Colorado is expected to settle at a density that is naturally regulated locally by wild ungulate prey availability and distribution (Mech and Barber-Meyer 2015), territoriality (Cariappa et al. 2011), and extrinsically by social carrying capacity statewide (CPW 2023a). Nonlethal take (harassment) would become integrated into livestock husbandry best management practices. Ongoing management actions

(lethal and nonlethal) would occur under alternative 1, but they are not expected to have population-level impacts statewide. Given the amount of ecologically suitable habitat and prey availability in Colorado (Carroll et al. 2006; Ditmer et al. 2022), the wolf population is expected to increase at rates similar to other established populations in the long term (i.e., 20 percent per year; Fuller et al. 2003).

Wolf Habitat and Connectivity

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

Alternative 1 could result in adverse impacts to individual wolves through regulated take and could delay recovery in the short term, but is not expected to hinder recovery or have adverse population-level effects in the long term. Alternative 1 promotes an adaptive management approach for wildlife managers to support wolf conservation and to implement deterrent tools (lethal and nonlethal take) that reduce the potential for livestock depredation and therefore may increase social tolerance of reintroduction.

Alternative 2

Under alternative 2, regulations and wolf management approaches would be implemented in two different ways. In most of Colorado, reintroduced wolves would potentially be managed as an experimental population under a section 10(j) rule. Should an existing population of wolves be determined to exist in a specific area of the state before the proposed rule is finalized, those wolves would be managed as an endangered species under a section 10(a)(1)(A) permit, and the population of reintroduced wolves would be managed within an experimental population boundary that is wholly separate geographically from the 10(a)(1)(A) permit area (see section 2.4.3). Resolution of conflicts would depend on where the wolves are located in the state. See section 2.4.5 for details on the type and nature of interactions associated with this alternative.

Wolf Numbers and Distribution

In the part of the state where the section 10(j) rule is approved, short- and long-term impacts would be the same as described for alternative 1. In the 10(a)(1)(A) permit area, wolf density may be higher in the short term because only nonlethal take would be permitted on both private and public land. The 10(a)(1)(A) permit area may act as a source habitat where the wolf population growth rate and density increases, compared to the rest of the state where risk of human-caused mortality is higher (O'Neil et al. 2020). This may ultimately lead more quickly to a statewide population as defined by the Service (at least two breeding pairs of wild wolves successfully raising at least two young each year for two consecutive years), which could result in a change the wolf protections in the entire state. However, there is uncertainty in quantifying rates of population growth in the 10(a)(1)(A) permit area and in the experimental population boundary because it is currently not known how many wolves would be reintroduced in the state, how much legal take would occur in the experimental population boundary, and how much illegal take would occur in the 10(a)(1)(A) permit area.

The more rapid population growth that is initially expected with the added protection in the 10(a)(1)(A) permit area would cease as wolves approach the ecological carrying capacity of the 10(a)(1)(A) permit area (Smith et al. 2003). In the long term, wolves would naturally disperse from the 10(a)(1)(A) permit area and colonize suitable habitat in the experimental population boundary with sufficient prey and minimal social conflicts with humans and other wolves. Prey densities are considered high enough in Colorado to support wolves (Ditmer et al. 2022). It is expected that in the long term, the wolf population would increase at rates similar to the management approach of alternative 1. In addition, control measures are expected to be similar to alternative 1 in the

experimental population boundary. As noted above, lethal control would not be authorized in the 10(a)(1)(A) permit area.

Wolf Habitat and Connectivity

Similar to alternative 1, wolf habitat and connectivity would not be affected because there would continue to be natural emigration and immigration from neighboring packs in the northern Rockies under alternative 2.

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

4.4.2 Other Species of Special Concern

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

The reintroduction of wolves in Colorado could affect species of special concern. As top predators, gray wolves could compete with other listed predators, such as Canada lynx, or prey on listed ground-nesting birds, such as Gunnison sage-grouse. However, the TWG concluded in its final recommendations to CPW that, “The presence of wolves will not have an impact on populations of threatened and endangered species in Colorado, specifically lynx and Gunnison sage grouse” (TWG 2022c). Neither of these are primary prey species for wolves. Moreover, predation and competition with wolves (where their ranges overlap) have not been documented as driving factors for population decline, nor are they considered barriers to recovery success for either of these species (Braun 1998; Murphy et al. 2006; USFWS 2017a).

Cooperating agencies in the development of this EIS expressed concern that gray wolves could breed with Mexican wolves, a subspecies that has been reintroduced in New Mexico and Arizona, potentially resulting in interspecies competition or genetic swamping, if the ranges of both species expand and eventually overlap (Odell et al. 2018). The Service is currently working with states to minimize impacts on Mexican wolf recovery, including using other federal permitting mechanisms or other tools (see Chapter 5 for more information). Although reintroduced wolves could affect species of special concern through various direct and indirect interactions, these potential consequences are related to the State of Colorado’s action and are therefore addressed in the cumulative effects analysis.

Commented [DT12]: While of interest this is outside the scope of our review so would rely on comments from states with extant Mexican wolves for their insight.

No-Action Alternative

Under the no-action alternative, the Service and its designated agents would not have the flexibility to manage reintroduced wolves for the purposes of protecting or managing species of special concern, including other federally or State-listed species. If populations of species of special concern decline as a result of predation or other pressures associated with the presence of wolves, the Service and its designated agents would not have the flexibility to manage wolves using nonlethal or lethal methods to promote conservation or recovery of protected species because reintroduced wolves in Colorado would not be designated as an experimental population under ESA section 10(j) and would be protected as a federally endangered species throughout the state. Effects on prey species could be short or long term and adverse, if their populations decline as a result of wolf reintroduction. The no-action alternative could also have long-term, adverse effects on the Mexican wolf if the ranges of both species expand and interbreeding or competition occurs. As noted above, it is difficult to determine the timing, extent, and effects of potential future contact between gray wolves and Mexican wolves. However, the Service has committed to working with states and the Mexican Wolf Recovery Program to mitigate potential future impacts to Mexican wolf recovery. Overall, the no-action alternative is not likely to adversely affect species of special concern because substantial population declines or jeopardy of the continued existence of species of special concern have not been documented as a result of previous wolf reintroductions elsewhere in North America and are not anticipated to result from the reintroduction of wolves in Colorado (TWG 2022c).

Alternatives 1 and 2

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

4.5 OTHER WILDLIFE SPECIES

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

The reintroduction of wolves in Colorado could affect other wildlife species through predation and competition. Wolves can influence other wildlife populations either directly (e.g., predation) or indirectly (e.g., behavioral modification of prey species and mesocarnivores [predators that occupy mid-levels of food webs]; Estes et al. 2011; Ripple and Beschta 2012; Ripple et al. 2014). The reintroduction of wolves could cause prey species to change their feeding habits by avoiding areas where they could readily be ambushed or change their movement patterns and habitat preferences (Smith et al. 2003; Fortin et al. 2005; Creel et al. 2011), as was observed in elk after the reintroduction of gray wolves in Yellowstone National Park. Similarly, in some areas where wolves have been restored, competing carnivores have changed their predation habits or habitat selection to avoid competition with wolves (Smith et al. 2003; Bartnick et al. 2013). These potential consequences are related to the State of Colorado's action and would not be affected by any alternative selected by the Service for flexibility (or lack

thereof) in the management of wolves in Colorado with regard to take as defined under the ESA. Therefore, they are beyond the scope of this EIS and are not included in the following analysis.

The following analysis is limited to potential environmental consequences of the alternatives on Colorado's ungulate populations. In recognition of Tribal sovereignty, alternatives 1 and 2 include a provision for the take of wolves in limited circumstances, including in the event that wolf predation is having an unacceptable impact on wild ungulate populations on reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado. However, the alternatives do not provide management flexibility for wolves for the purposes of protecting or managing other wildlife populations. Therefore, potential impacts of wolf reintroduction on non-ungulate populations would occur independently of the proposed action and would not be affected by the alternative selected. As a result, only impacts related to the take provision for management of wolves to address impacts to ungulates on reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado are discussed below.

4.5.1 No-Action Alternative

Elk and Deer

Under the no-action alternative, Colorado's statewide elk and deer populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. However, wolf presence may or may not directly influence changes in ungulate population dynamics. Prey populations naturally vary through time in response to environmental factors (e.g., severe winters, natural mortality), predation pressure, hunter harvest pressure, and habitat conditions (Smith et al. 2003). If elk and deer populations declined below Tribal management objectives, the Service and its designated agents would not have the flexibility to manage wolves to meet elk and deer management goals, even if wolves were a major driver of population decline, because reintroduced wolves in Colorado would not be designated as an experimental population under ESA section 10(j) and would be protected as a federally endangered species throughout the state. Therefore, the no-action alternative could adversely affect elk and deer over the long term. However, it is possible that minimal adverse effects would occur because although elk and deer populations may decline in the short term at the local level in response to wolf predation, it is likely they would stabilize over the long term (due to natural fluctuations in their populations), as was observed at Yellowstone National Park in the years following gray wolf reintroduction (Smith et al. 2003).

Other Ungulates

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

4.5.2 Alternative 1

Under alternative 1, gray wolves that would be reintroduced to Colorado would be managed as an experimental population under the section 10(j) rule. In recognition of Tribal sovereignty on reservation lands for the Southern Ute Indian Tribe and Ute Mountain Ute Tribe within Colorado, if wolf predation is having an unacceptable impact on wild ungulate populations (deer, elk, moose, bighorn sheep, mountain goats, or antelope) as determined by the respective Tribe, a Tribe may submit a science-based proposal that considers lethal removal of wolves. "Unacceptable impact" is defined as a "Tribeally determined decline in a wild ungulate population or herd, where

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Commented [DT13]: Why not outside tribal lands as well?

wolf predation is a major cause, of the population or herd not meeting established Tribal management goals on Tribal land.” The Tribal determination must be peer-reviewed and commented on by the public, prior to a final, written determination by the Service that an unacceptable impact has occurred, and that wolf removal will benefit the affected ungulate herd or population.

Elk and Deer

Elk and deer are likely to be the primary prey for wolves in Colorado based on their population densities in the statewide study area and documented prey selection by wolves elsewhere in the northern Rocky Mountains. Although elk and deer have the highest population densities in Colorado compared to other wolf prey species, their populations could decline over time as a result of predation, behavioral changes, or changes in habitat use in response to wolf reintroduction (Smith et al. 2003; Estes et al. 2011; Ripple and Beschta 2012).

Compared to the no-action alternative, under which the State would reintroduce gray wolves without the management flexibility that would be provided by the section 10(j) rule, alternative 1 could have a beneficial impact on elk and deer on reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado over the long term because the Tribes could submit a proposal to use lethal take if wolves are having unacceptable impacts on elk and deer populations, subject to final, written determination by the Service that an unacceptable impact has occurred and that wolf removal will benefit the affected ungulate herd or population. However, because this provision would be limited to reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado, which make up a relatively small portion of the state’s geographic area, it would not likely result in measurable effects on statewide elk and deer populations. Therefore, impacts on statewide elk and deer populations would be similar to those described for the no-action alternative.

Commented [DT14]: Same as previous comments.

Other Ungulates

Other ungulates such as pronghorn, wild sheep, and moose could also be selected prey species for wolves in the focal counties or elsewhere in the state. Like with elk and deer, alternative 1 would allow the Ute Mountain Ute Tribe and Southern Ute Indian Tribe the flexibility to manage wolves on their reservation lands within Colorado if wolves cause the populations of other ungulates to decline below established Tribal management objectives, potentially resulting in a long-term, beneficial impact on these species on reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado. However, because this provision would be limited to reservation lands for these Tribes within Colorado, it is not likely to result in measurable effects on statewide populations. Therefore, impacts on statewide ungulate populations would be similar to those described for the no-action alternative.

4.5.3 Alternative 2

Under alternative 2, gray wolves that would be reintroduced to Colorado would be managed as an experimental population under the section 10(j) rule but in an area smaller than the area described for alternative 1.

Like alternative 1, alternative 2 would allow the Service to authorize limited take of wolves on reservation lands for the Ute Mountain Ute Tribe and Southern Ute Indian Tribe within Colorado, if wolf predation is having an unacceptable impact on wild ungulate populations. Therefore, the environmental consequences of alternative 2 on other wildlife species would be the same as described under alternative 1.

4.6 TRIBAL CULTURAL RESOURCES

The following section discusses the potential impacts to Tribal cultural resources, which for the purposes of this evaluation, include archaeological and historical sites and natural resources of importance to Tribes, as well as

Commented [DT15]: As with earlier segment, this is outside the scope of our review and would rely on the comments from other tribal entities.

Tribal treaty rights and reservations. Information on government-to-government consultation with interested Tribes is provided in section 3.4.4 and Chapter 5.

4.6.1 No-Action Alternative

Archaeological and Historical Resources

Under the no-action alternative, the Service and its designated agents would have limited management options available to control the presence of wolves (i.e., reintroduced gray wolves, pre-existing wolf populations, and those naturally dispersing to Colorado) that may cause damage to archaeological and historical resources or inhibit Tribal access to these resources.

Wolf activities could damage Tribal archaeological and historical resources located within the focal counties, as well as those outside these counties. For example, archaeological or historical resources that may be affected in Colorado include rock shelters (labeled in the OAHP database as Sheltered Lithic, Sheltered Camp, and Sheltered Architectural), because wolves could use the locations in which these sites are present as dens, thus affecting the ability of cultural practitioners to visit and tend to these sites. Wolves may excavate soil to create a new den or expand an existing one used by other mammals (Wisconsin DNR 2016). “Den openings generally are 36 to 63 cm in diameter (14-25 inches) and are oval in shape.... Depth into the dens range from 1.5-5.5 m (5-18 ft)” (Wisconsin DNR 2016). The development of a den by a wolf may cause ground disturbance that could impact a surface or subsurface resource, if present in the same location in which the den is being created or used.

Within Colorado, for example, resources associated with the traditional hunting grounds of the Ute are not quantified as formal site types within the OAHP database but are sometimes marked by Cambium Trees, which are recorded in the database. As labeled in the OAHP database, rock shelters (Sheltered Lithic, Sheltered Camp, and Sheltered Architectural sites) and Cambium Tree (Cambium Tree and Carving Rock or Wood Cambium Tree sites) locations were previously recorded in the focal counties. Due to the large geographic expanse of the area considered, the likelihood of a wolf creating a den in one of the locations of a rock shelter or causing physical damage to one of the Cambium Tree sites is anticipated to be low.

Natural Resources of Cultural Importance

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

Reintroduced wolves as well as those already living in or naturally dispersing into Colorado could impact natural resources, including other wildlife of importance to Tribes, in part due to competition resulting in changes to predation habits or habitat selection. For example, as noted in section 3.4, the bear is honored by the Ute Mountain Ute Tribe, Southern Ute Indian Tribe, and Ute Indian Tribe of the Uintah and Ouray Reservation in the bear dance (Southern Ute Indian Tribe 2022; Steward 1932). As discussed in section 3.2.1, *Gray Wolf*, wolves may directly compete with other predators for prey or habitat, including the black bear. Bears may kill or be killed by wolves. In some areas where wolves have been restored, competitors have changed their predation habits or habitat selection to avoid competition with wolves. Section 3.2.1, *Gray Wolf*, indicates that black bears occur throughout most of the western two-thirds of Colorado, and wolves have been documented to kill black bears on occasion. In the majority of these cases, wolves have outnumbered black bears, giving them a competitive advantage in interspecies conflicts.

Tribal Treaty Rights and Reservations

The introduction of wolves, along with those already living in and naturally dispersing into Colorado, may affect Tribal treaty rights, including those within the Brunot Area lands, for off-reservation hunting. The introduction of

wolves may impact the population of elk, deer, other ungulates, and moose due to their presence within locations used for hunting (see also section 4.5, *Other Wildlife Species*, and section 4.7, *Socioeconomic Resources*).

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

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

As a result, under the no-action alternative, elk and deer populations could decline in response to predation and other pressures as a result of wolf reintroduction. Section 4.5 indicates that the no-action alternative could affect populations of elk, deer, pronghorn, wild sheep, and moose over the long term.

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

Potential impacts associated with wolf depredation on domestic livestock are also discussed in section 4.7. Estimates show that between 103 and 916 cattle and between 35 and 395 sheep could be lost per year across the state, assuming a population of 200 wolves (see section 4.7 for a detailed discussion of these estimates). These numbers account for the entire state, rather than an individual location, such as one of the reservations.

Under this alternative, take would be allowed only as self-defense. Therefore, the Service or its designated agents would not have the ability to take wolves that depredate livestock. Consultation with the Service also would be required under section 7 of the ESA.

4.6.2 Alternative 1

Archaeological and Historical Resources

Impacts to archaeological and historical resources under alternative 1 are anticipated to be similar to those described for the no-action alternative. However, impacts to these resources, such as damage from dens and inhibiting access to sites, may be reduced indirectly through the management flexibility offered by the section 10(j) rule, which the Service and its designated agents may use to protect other resources, such as livestock, and to protect human safety. As noted above for the no-action alternative, the likelihood for conflict with wolves would be anticipated to be low due to the numbers of recorded sites present and probability that wolves may use these sites.

Natural Resources of Cultural Importance

Impacts to natural resources of cultural importance are anticipated to be similar to those described for the no-action alternative (e.g., competition between species resulting in changes to predation habits or habitat selection), although additional management options for the reintroduction of gray wolves would be available to the Service and its designated agents under alternative 1. An additional discussion of impacts on wildlife species is included in sections 4.4 and 4.5.

The Service further recognizes that “many Indians use federally protected birds, bird feathers and remains, and other animal and plant material for their Tribal cultural and religious expression. [The Service] will work in

collaboration with Tribal governments to protect traditional, customary, ceremonial, medicinal, spiritual, and religious uses of plants and animals for Tribal members where it is not contrary to [the Service's] legal mandates and conservation goals" (USFWS 2016).

Tribal Treaty Rights and Reservations

The Service outlines some of the methods for collaborative management of threatened and endangered species with Tribes in its Native American Policy, Part 510: Working with Native American Tribes. According to this policy, "There is a broad range of collaborative management opportunities available to the Service and Tribes. These opportunities include holding informative discussions to seek Tribal input, entering into formal agreements with Tribes, cooperatively setting harvest quantities, and sharing conservation management of resources" (USFWS 2016).

If population levels of elk and deer on reservation lands of the Southern Ute Indian Tribe and Ute Mountain Ute Tribe in Colorado decline below established Tribal management goals as a result of wolf reintroduction, management flexibility, including nonlethal and/or lethal take, could be afforded to the Service and the Tribes, as designated agents, under alternative 1. This provision would allow these entities to take wolves as a means to achieve established goals for the management of wild ungulate populations on reservation lands. This provision would require the Tribe to submit science-based proposal to describe how wolf control might benefit the ungulate population and other measures that are being implemented to improve ungulate populations (see table 2.2 in section 2.4.2 for additional information to be included in the proposal). The Service would ensure the proposal from the Tribe to conduct any control is science-based and would not have a significant effect on the wolf population. As described in section 4.5, alternative 1 could have a beneficial impact on elk, deer, and other wild ungulates on reservation lands over the long term.

Tribes would be able to conduct wolf management to address depredation of livestock and impacts on ungulate populations from wolves on Tribal reservation lands as designated agents of the Service within the experimental population boundary on reservation lands. Tribes would be required to obtain prior approval from the Service before implementing certain management actions as outlined in Chapter 2. These management actions could reduce potential impacts if wolves were allowed to occupy reservation lands.

A similar approach was used under the final 10(j) rule for the experimental population of gray wolves in the northern Rocky Mountains region, where the Service's final 10(j) rule provided for recognition of the unique relationship between federal and Tribal governments. In this manner, the rule provided Tribes with the same opportunities on reservation lands that the Service offered to states for their land under their management authority. As a result, Tribes with Service-approved wolf management plans could assume the lead for management of wolves under the final 10(j) rule on their reservation lands (DOI 2005). "This rule also treats Tribal members' lands on reservations as private property within the borders of States with approved wolf plans, increasing wolf management flexibility to protect the private property of Tribal members. In addition, Tribal members who are legally grazing their livestock on public lands may protect them from wolf attack" (DOI 2005).

The provision to allow take of wolves to address potential impacts on ungulate populations on the reservation lands of the Southern Ute Indian Tribe and Ute Mountain Ute Tribe in Colorado would not apply on lands owned by the Tribes outside Tribal reservations or in the Brunot Area, which may affect Tribal treaty rights for off-reservation hunting. These impacts would be similar to those described for the no-action alternative.

Due to the potential use of lethal and nonlethal take to address wolves that depredate livestock, the impacts associated with wolf reintroduction to livestock production by Tribes may be lower under alternative 1 when compared to the no-action alternative (see section 4.7 for additional information). This alternative provides more flexibility in managing the wolf reintroduction compared to the no-action alternative.

4.6.3 Alternative 2

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

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

Archaeological and Historical Resources

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

Natural Resources of Cultural Importance

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

Tribal Treaty Rights and Reservations

Under alternative 2, impacts to Tribal treaty rights and in the experimental population boundary would be similar to those as presented for alternative 1. However, alternative 2 would allow for lethal and/or nonlethal take to address livestock depredation and to address potential impacts to wild ungulate populations on the reservations of the Southern Ute Indian Tribe and Ute Mountain Ute Tribe in Colorado, except in areas where an existing population is identified, where section 10(a)(1)(A) would apply and only nonlethal take would be authorized.

4.7 SOCIOECONOMIC RESOURCES

4.7.1 Methodology

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

Impacts on outdoor recreation were considered for all three alternatives. Under all three alternatives, there would be no take provision across the state to allow for management of wolves if predation reduces the population of big game ungulates below state management objectives (see section 2.3.3). While alternatives 1 and 2 would have provisions to allow take of wolves to address potential impacts on ungulates on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands in Colorado, these provisions would be limited and would not address impacts on ungulate populations from wolves across the state.

4.7.2 No-Action Alternative

Impact on Outdoor Recreation

Outdoor recreation contributes more than \$800 million and 7,937 jobs to the Colorado economy (see Chapter 3). The three alternatives evaluated could affect outdoor recreation, particularly hunting outfitters and guides because there would be no statewide provision to address wolf impacts on ungulate populations outside Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands in Colorado.

Hunting

Elk populations and hunter harvest have not fallen in Montana, Idaho, and Wyoming, where wolves were reintroduced in the mid-1990s. However, the effects of wolves on large game vary locally. In the Greater Yellowstone ecosystem, where wolves and elk interact, elk numbers are steady or increasing in some areas but declining in others. When combined with other factors that limit prey populations such as harsh weather, other predators, and human hunters, predation by wolves is more likely to affect big game populations (Mech 2012). The presence of wolves can make big game warier, move more, and use habitat differently by seeking more cover, making hunting more difficult.

A decrease in elk populations could affect hunting by reducing the number of licenses issued and discouraging hunters in general (Miller 1982). A 2012 economic analysis developed a way to measure wolf impacts on elk harvest and used that as a proxy to access the impacts wolves have on the hunting industry (Hazen 2012). The study determined that wolves did not have a major impact on elk harvest in Montana statewide; however, wolves shifted the demand for big game hunting to other parts of the state where wolves were not introduced.

If ungulate herds fell below State or Tribal population goals or the presence of wolves altered the movement patterns of big game species and/or shifted demand for hunting to different parts of the state, then outfitters and guides could experience long-term, localized consequences under all alternatives analyzed. Additionally, a shift in hunting demand could decrease hunting revenues in localized areas. The same 2012 study found that the number of hunting applications decreased in parts of the state where wolves were present. In southwest Montana, the presence of wolves decreased hunter applications by almost 20 percent of the standard deviation (i.e., the background amount of variation in application numbers across the state). This decrease comprised 286 fewer applications. In the west-central part of the state, applications decreased by nearly 3 percent of the standard deviation (six fewer applications) (Hazen 2012). CPW uses hunting license fees to help fund agency operations. A decline in hunting applications could lead to decreased wildlife revenue for CPW, which may result in a decrease in funds available for wolf or other management operations.

Impact on Agriculture and Livestock Production

Reintroduction of wolves by the State of Colorado, which would occur under each of the alternatives, would result in direct and indirect costs to livestock producers as a result of the increased risk of, and direct predation of livestock. Under the no-action alternative, only non-injurious opportunistic harassment could be permitted under section 10(a)(1)(A) of the ESA to address instances of livestock depredation. Livestock producers would have the fewest take options to manage wolf predation on their livestock and may incur the highest commercial costs due to depredation. Because the State would manage the reintroduction of gray wolves in phases, wolf depredation on domestic livestock statewide is anticipated to be minimal in the short term due to the initial low numbers and distribution of wolves. However, localized depredation may result in more substantial economic impacts to individual producers in the short term. As wolf population goals are approached and the number and distribution of wolves increase, losses due to livestock depredation are anticipated to increase. The direct cost livestock producers can anticipate due to wolf depredation is the fair market value of any livestock killed by wolves. Indirect costs that livestock producers may face could include: (1) livestock injuries, (2) lower birth weights of

livestock, (3) smaller weight at sale (especially for calves and lambs), (4) property repairs to fences and buildings, (5) loss of silage and grains, (6) costs to implement nonlethal wolf-livestock conflict avoidance and reduction methods, and (7) time of landowners (Harris 2020).

Through a review of literature, Harris (2020) concluded that indirect economic losses often exceed the cost of replacing an animal killed by a wolf. On ranches where wolf-cattle depredation was proven, there was a negative and statistically significant effect of about 22 pounds on the average calf weight across the herd, presumably due to ineffective foraging behavior or stress on mother cows (Ramler et al. 2014). According to two studies (Sommers et al. 2010; Steele et al. 2013), unconfirmed and indirect losses could cost up to six times more than verified losses. However, other researchers concluded that these figures were exaggerated (Hebblewhite 2011).

The State Plan released by CPW in 2023 discusses a detailed depredation compensation and conflict minimization program. CPW will seek money for the compensation program from sources other than hunting and fishing license sales or government subsidies. For documented livestock deaths or injuries, including guard or herding animals, the compensation program provides 100 percent fair market value compensation, up to \$15,000 per animal. Depending on whether they choose a simplified approach or more documentation, livestock owners can select between a basic compensation ratio and detailed production losses. They cannot, however, pursue both alternatives at the same time. The goal is to offer enough compensation and support while decreasing wolf-livestock conflicts (CPW 2023a); however, compensation programs are not guaranteed to cover the total direct or indirect costs associated with a producer's losses. In an effort to minimize conflicts, on a case-by-case basis, livestock owners may obtain materials, specifically turbo fladry and scare devices, and CPW will educate them on various ways to minimize wolf conflicts. Livestock owners can request these materials in writing, and CPW staff may provide assistance in deploying them. CPW will also educate livestock owners on conflict minimization techniques (CPW 2023a). These measures may offset some indirect costs to producers.

Livestock producers experience diminished economic returns resulting from both the direct and indirect effects of predation by wolves. These impacts impose costs on producers, encompassing losses due to wolf predation-related mortality as well as various indirect consequences. There are few studies that estimate the indirect impacts that wolves have on calf weight. However, one study found a statistically significant effect on cattle calf weights on ranches with confirmed wolf predation (Ramler et al. 2014). Furthermore, calves pastured on a ranch with confirmed depredation were 3.5 percent lighter than those without depredation. The resulting weight loss equaled an average of \$6,679 loss in revenue for the ranchers in the study's sample population.² When extrapolated to western Montana, the study found that weight loss of cattle due to wolf depredation would result in a loss of \$247,130 (Ramler et al. 2014). Another study analyzed how wolves affect ranch profitability using a 400-head cow-calf ranch in Wyoming and found that short-run financial impacts of indirect effects are potentially as large or even more prominent than those of direct wolf predation. Decreased conception rates and a decline in weaning weights had a negative effect on the year-to-year profitability of the ranch, reducing the short-run profitability by \$10,250 to \$12,855, which was comparable to or larger than the direct average predation loss of \$10,778 (Steele et al. 2013).

The direct economic impact from livestock depredation on ranchers is calculated by multiplying the estimated number of lost animals per year by the market value. This analysis uses data from the Service that compiles confirmed wolf-caused livestock depredations from State agencies and reflects the best available data. Data from the Service represent a lower bound of livestock depredations due to the omission of undiscovered or unreported predation. Data available from other sources such as NASS may be inflated because NASS estimates depredation based on data self-reported by livestock producers rather than confirmed data on confirmed wolf depredations (Hoag et al. 2022). Available depredation data suggest that livestock being killed by wolves is a small economic

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² Based on a sample of 18 ranchers in western Montana.

cost to the livestock industry as a whole, but it can be significant to some producers. Literature often uses the example that direct losses from wolf depredation on cattle and sheep accounted for less than 1 percent of the gross income from livestock operations in the northern Rocky Mountains between 1987 and 2003³ (Muhly and Musiani, 2009), drawing the conclusion that wolf depredation's impact on the livestock industry is minimal. However, those costs are not evenly distributed, and this example understates the high costs that individual producers incur (Hoag et al. 2022). Both direct and indirect losses could substantially affect the livelihood of individual ranchers operating on thin profit margins in volatile markets. Though not widely researched, some livestock producers are more vulnerable to wolf predation than others. Factors that potentially determine which producers are more likely to experience wolf predation on their livestock include where livestock are grazed, livestock type, the type of operation (i.e., range versus pasture operations), and how much the livestock are protected (Center for Human-Carnivore Coexistence 2020a).

Economic Loss

The following equation was taken from the *Final EIS for the Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho* to estimate the annual depredation in Colorado and the 21 focal counties (USFWS 1994):

$$\frac{\text{No. of livestock in Analysis Area}}{\text{No. of livestock in Other Area}} \times \frac{\text{No. wolves in Analysis Area}}{\text{No. wolves in Other Area}} \times \text{Mean annual depredations (other study area)} \\ = \text{Estimated annual depredations in Analysis Area}$$

Estimating depredation rates should be done with caution, as mentioned in the Yellowstone National Park EIS, because the terrain, vegetation, weather, farm size, husbandry practices, and prey populations vary between places. However, to assess the possible impacts of the wolf population on livestock, the following equation was constructed to standardize depredation rates from reference areas outside Colorado in relation to total livestock in the wolf range and wolf populations. Table 4-1 provides livestock totals for Colorado, the 21 focal counties, and reference areas. The analysis carried out in this study concentrates on the reference areas of the WTGMA and the regions of eastern Washington and eastern Oregon within the Northern Rocky Mountains Distinct Population Segment (NRM DPS). This selection is based on the similarity of management approaches by these states in the reference areas to the management proposed for Colorado under alternatives 1 and 2. Statewide data for Wyoming, Oregon, and Washington are provided solely for reference purposes and are not used in the analysis. Livestock totals for target geographies (the WTGMA and Oregon and Washington portions of the NRM DPS) were calculated by multiplying the total number of cattle and sheep in each county, excluding those in feedlots, by the percentage of non-park pasture land in that county that exists within the target geography.

Tables 4-1 and 4-2 present the data used in this equation. Table 4-3 presents the range of estimated depredation of cattle and sheep in Colorado and the 21 focal counties based on calculations using data from the reference areas.

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³ During this period, gray wolves were managed as federally listed endangered species in the region.

Table 4-1.⁴ Livestock Totals in Colorado, the 21 Focal Counties, and the Reference Areas

Analysis Area	Cattle ^a	Sheep	Total Livestock
Colorado (Statewide Study Area)	1,807,069	414,672	2,221,741
21 Focal Counties ^b	504,471	172,228	676,699
Reference Areas			
Wyoming	1,236,739	367,702	1,604,441
WTGMA - Wyoming	96,202	23,544	20,476
Washington	938,035	52,329	990,364
Washington (NRM DPS)	301,332	15,372	316,704
Oregon	1,151,509	177,646	1,329,155
Oregon (NRM DPS)	326,570	15,290	341,860

Source: 2017 USDA-NASS

^a Excludes dairy cows and cattle on feed.

^b No cattle or sheep feedlots are located in the 21 focal counties in Colorado.

^c The livestock totals used in this analysis are based on 2017 data. These data represents the most recent available statistics from the USDA-NASS.

Table 4-2 presents the number of confirmed wolves in the reference areas. Based on the averages of 2018–2022 state wolf counts, the WTGMA had the highest number of wolves, while the portion of the NRM DPS in Washington had the lowest. No resident groups of wolves were documented in Colorado until January 2020, when CPW confirmed a group of at least six wolves in Moffat County near the Wyoming and Utah border. One year later, in January 2021, a pair of wolves was sighted in Jackson County. In June 2021, that pair was identified with six pups. Three separate wolf depredation incidents on cattle were confirmed on a ranch in Jackson County, Colorado, between December 2021 and January 2022 (CPW 2021c, 2022d). Because of the limited number of wolves and depredations in Colorado during the study timeframe, data from the reference areas was used to estimate future depredation in Colorado instead of the Colorado data noted above.

⁴ The analysis involved calculating the percentage of a county’s pasture land that lay within the reference area and multiplying it by the total number of cattle and sheep (excluding dairy cows and livestock on feedlots) to obtain a more precise estimate of livestock totals for the reference areas. The calculation was performed explicitly for the reference areas, which sometimes encompassed portions of counties: the WYGMA and the portions of the NRM DPS in Washington and Oregon.

Table 4-2. Confirmed Number of Wolves and Livestock Depredation by Wolves in the Reference Areas (2018–2022 Average)

Study Area	Number of Wolves	Cattle Depredation (2018–2022)	Sheep Depredation ^a (2018–2022)
Reference Areas			
Wyoming	315	50	31
WTGMA - Wyoming	179	44	17
Washington	174	11	1
Washington (NRM DPS)	123	11	1
Oregon	164	29	10
Oregon (NRM DPS)	135	15	10

Source: Oregon DFW 2019–2023, Washington DFW et al. 2019–2023, Wyoming GFD et al. 2019–2023

The application of the equation to the Colorado statewide study area and the 21 focal counties, using the long-term planning estimate of 200 wolves⁵ and data from the reference areas for comparison, yielded a range of estimated annual depredations for both Colorado and the 21 focal counties.

Table 4-3. Estimated Annual Depredations in Analysis Area

Area	Estimated Annual Cattle Depredation	Estimated Annual Sheep Depredation
Colorado (Statewide Study Area)	103–916	35–395
21 Focal Counties	29–256	15–163

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The direct expenses incurred by livestock producers would be the total value loss of their livestock or, in this case, the total value loss of cows and sheep. Adjusted for inflation, there would be an estimated loss between \$175,496.74 and \$1,561,728.78 in the statewide study area and \$35,713.29 to \$319,168.32 in the 21 focal counties annually. As previously mentioned, livestock producers also would incur indirect costs as a result of wolf predation on their livestock, including costs associated with nonlethal injuries to livestock, decreased conception rates, decreased livestock weight (especially of calves and lambs), and costs associated with repairing fences and buildings, as well as silages and grain losses (Harris 2020).

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A survey of Arizona cattle ranchers gathered information on the costs associated with nonlethal wolf-livestock conflict avoidance and reduction methods. On average, ranchers spent between \$5,700 and \$6,000 per year on range riders, \$1,000 to \$15,000 per year on changing pasture rotation or transporting cattle to another location, \$300 to \$700 per each removal of livestock carcasses, and between \$20,000 and \$30,000 per year on purchasing cattle feed for cattle moved off their range. The total annual cost incurred by these ranches ranged from \$500 to \$52,000, with an average of \$19,507. In addition, these ranchers reported expenditures connected with implementing preventive measures. The annual investment ranged from 17 to 1,555 hours, or around 30 hours

Commented [DT19]: Range Riders are extremely effective at locating depredated livestock to inform management decisions. From a carnivore conflict management perspective this is their best asset.

⁵ A population of 200 wolves is a planning estimate and the high-end threshold at which the State anticipates delisting the gray wolf at the state level and managing the species as a delisted, nongame species (see section 2.4). The planning estimate of 200 wolves was used for both the statewide study area and the 21 focal counties. However, it is likely the number of wolves occurring in the 21 focal counties would be less than the number of wolves across the state.

each week (Bickel et al. 2020). This analysis uses data from Bickel et al. 2020 to estimate indirect costs for Colorado livestock producers. However, these indirect costs are not all-inclusive of the indirect costs livestock producers face and likely understate total indirect costs. Using this data and adjusting for inflation, Colorado livestock producers would incur an estimated \$45,844.82 in indirect costs annually (see table 4-4).

Table 4-4a. Estimated Annual Economic Costs Associated with Livestock Depredation in Statewide Study Area and the 21-County Study Area Using the WTGMA as a Reference Area

Using the WTGMA – Wyoming as a Reference Area	Colorado	21 Focal Counties
Cattle Lost	916	256
Sheep Lost	339	141
Direct Costs of Livestock Loss	\$1,261,856.01	\$257,883.74
Direct Costs of Livestock Loss (Inflation-adjusted to 2023)	\$1,561,728.78	\$319,168.32
Indirect Costs of Livestock Loss	\$37,042.00	\$37,042.00
Indirect Costs of Livestock Loss (Inflation-adjusted to 2023)	\$45,844.82	\$45,844.82
Total Costs of Livestock Loss	\$1,298,898.01	\$294,925.74
Total Costs of Livestock Loss (Inflation-adjusted to 2023)	\$1,607,573.59	\$365,013.13
Percent of Value Loss	0.0315%	0.0071%

Table 4-4b. Estimated Annual Economic Costs Associated with Livestock Depredation in Statewide Study Area and the 21-County Study Area Using the Washington NRM DPS as a Reference Area

Using the Washington NRM DPS as a Reference Area	Colorado	21 Focal Counties
Cattle Lost	103	29
Sheep Lost	35	15
Direct Costs of Livestock Loss	\$141,799.02	\$28,855.86
Direct Costs of Livestock Loss (Inflation-adjusted to 2023)	\$175,496.74	\$35,713.29
Indirect Costs of Livestock Loss	\$37,042.00	\$37,042.00
Indirect Costs of Livestock Loss (Inflation-adjusted to 2023)	\$45,844.82	\$45,844.82
Total Costs of Livestock Loss	\$178,841.02	\$65,897.86
Total Costs of Livestock Loss (Inflation-adjusted to 2023)	\$221,341.55	\$81,558.10
Percent of Value Loss	0.0045%	0.0017%

Table 4-4c. Estimated Annual Economic Costs Associated with Livestock Depredation in Statewide Study Area and the 21-County Study Area Using the Oregon NRM DPS as a Reference Area

Using the Oregon NRM DPS as a Reference Area	Colorado	21 Focal Counties
Cattle Lost	120	34
Sheep Lost	395	164
Direct Costs of Livestock Loss	\$229,488.11	\$60,660.94
Direct Costs of Livestock Loss (Inflation-adjusted to 2023)	\$284,024.63	\$75,076.66
Indirect Costs of Livestock Loss	\$37,042.00	\$37,042.00

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Using the Oregon NRM DPS as a Reference Area	Colorado	21 Focal Counties
Indirect Costs of Livestock Loss (Inflation-adjusted to 2023)	\$45,844.82	\$45,844.82
Total Costs of Livestock Loss	\$266,530.11	\$97,702.94
Total Costs of Livestock Loss (Inflation-adjusted to 2023)	\$329,869.45	\$120,921.48
Percent of Value Loss	0.0068%	0.0025%

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Under the no-action alternative, the gray wolf would be managed in Colorado as a federally listed endangered species, and lethal and injurious take of wolves to reduce repeated livestock depredation would be prohibited. As a result, ranchers would experience the greatest economic loss under the no-action alternative. Table 4-4 presents a range of estimated total annual costs associated with livestock depredation in the statewide study area and the 21 focal counties determined by the reference areas used for comparison. Based on these calculations, wolf depredation may cost livestock producers in the statewide study area and 21 focal counties, adjusted for inflation, between \$221,341.55 and \$1,607,573.59 and between \$81,558.10 and \$365,013.13, respectively, including direct and indirect costs on an annual basis. A detailed explanation of the estimated costs of wolf depredation is provided in table 4-4. Because the states of Oregon, Washington, and Wyoming allow take of wolves to address conflicts with livestock production, these estimates do not fully account for depredation that may occur in Colorado under the no-action alternative. Depredation in Colorado under this alternative is likely to be higher, resulting in greater direct and indirect economic costs than the estimates provided above, because the Service and its designated agents would not be able to use a full range of take strategies to address repeated depredations. The reference geographies used in this analysis were selected, as noted above, because management of wolves by these states in these areas is similar to how wolves would be managed in Colorado under the action alternatives. These areas also have larger populations of wolves compared to other western states such as California, which has a smaller population of wolves in more limited geographic areas, potentially leading to skewed estimates of depredation and cost if this geographic area was used for comparison.

The estimated percent of livestock depredation would be 0.0315 percent of the total value of cow and sheep sales in the statewide study area and 0.0071 percent of the total value of cow and sheep sales in the 21 focal counties. However, these numbers underestimate the economic burden that livestock depredation could have on individual livestock producers. The factors that determine why certain producers are more susceptible to wolf predation than others have not been widely studied. However, the degree to which producers are vulnerable to wolf predation is likely contingent on where livestock are grazed (some regions have more wolf activity than others), the type of livestock (sheep are more vulnerable than cattle), the type of operation (e.g., cow/calf versus stocker⁶), range versus pasture operations, and the level of livestock protection (Center for Human-Carnivore Coexistence 2020b).

According to the Colorado Department of Agriculture, agriculture contributes \$47 billion to the state's economy and employs more than 195,000 people. Furthermore, the cattle industry generates more than \$4 billion in annual sales. Therefore, predator-caused livestock loss impacts business profitability, the business's contribution to the local economy, and community economics. According to the USDA Economic Research Service, the agriculture multiplier is around 2.6, which means that every dollar in agricultural profit invested in the economy is reinvested 2.6 times back into that economy. Therefore, the economic loss that ranchers face due to livestock depredation by wolves would indirectly impact the local economies within the statewide study area and the 21 focal counties. For the 21 focal counties collectively, adjusted for inflation, one cow contributes \$2,970.64, while a single sheep

⁶ Refers to weaned calves grazing pasture to enhance growth prior to finishing and slaughter; they are usually younger, weigh less, and are of lower condition (finish) than "feeders."

contributes \$593.90 to the 21 focal counties' economies (see table 4-5). The amount of money that is not reinvested back into the economies of the 21 focal counties due to wolf depredation ranges from \$86,148.56 to \$760,483.84⁷ for cattle, and \$8,908.50 to \$96,805.70 for sheep.

Table 4-5a. Economic Contribution of Cattle in the 21 Focal Counties Respective to their Local Economies (Adjusted for Inflation, 2023 Dollars)

Counties	Market Value of Cattle Sold	Inventory of Cattle and Calves	Market Value of Cattle/Calves (Per Animal)	Per Animal Contribution to Local Economy
Archuleta	\$11,562,072.16	10,172	\$1,136.66	\$2,955.31
Custer	\$5,798,363.10	5,529	\$1,048.72	\$2,726.67
Delta	\$26,871,433.98	23,694	\$1,134.10	\$2,948.67
Dolores	\$2,986,435.47	2,951	\$1,012.01	\$2,631.22
Eagle	\$5,955,543.91	6,024	\$988.64	\$2,570.45
Garfield	\$26,599,839.47	22,468	\$1,183.90	\$3,078.14
Grand	\$11,798,462.21	12,593	\$936.91	\$2,435.96
Gunnison	\$19,985,565.86	17,519	\$1,140.79	\$2,966.06
Huerfano	(D) ^a	17,144	-	-
Jackson	\$24,929,849.07	20,455	\$1,218.77	\$3,168.79
La Plata	\$14,325,031.09	13,241	\$1,081.87	\$2,812.86
Larimer	\$39,923,128.97	31,968	\$1,248.85	\$3,247.00
Mesa	\$35,356,551.60	28,255	\$1,251.34	\$3,253.48
Moffat	\$25,398,507.50	24,663	\$1,029.82	\$2,677.54
Montezuma	\$19,374,162.41	18,372	\$1,054.55	\$2,741.83
Montrose	\$42,901,825.91	35,764	\$1,199.58	\$3,118.91
Ouray	\$4,160,959.82	3,313	\$1,255.95	\$3,265.47
Rio Blanco	\$18,235,991.95	16,155	\$1,128.81	\$2,934.92
Routt	\$29,872,869.06	25,508	\$1,171.12	\$3,044.91
Saguache	\$17,524,793.32	17,036	\$1,028.69	\$2,674.60
San Miguel	\$6,575,603.66	5,781	\$1,137.45	\$2,957.37
Total (21 Focal Counties)^b	\$390,136,990.52	341,461	\$1,142.55	\$2,970.64

Source: 2017 USDA-NASS Census

^a If publishing a particular data item would identify an operation (for example, if there is only one producer of a particular commodity in a county), NASS does not publish the information. In such cases, the data are suppressed and shown as "(D)," meaning "withheld to avoid disclosing data for individual operations." A dash represents zero, no data for that particular data item. Source: <https://www.nass.usda.gov/AgCensus/FAQ/2022/index.php>

^b Totals omit data for Huerfano County.

⁷ The values of table 4-3 for cattle and sheep in the 21 focal counties multiplied by the per animal contribution to the local economy for cow and sheep.

Table 4-5b. Economic Contribution of Sheep in the 21 Focal Counties Respective to their Local Economies (Adjusted for inflation, 2023 Dollars)

Counties	Market Value of Sheep Sold	Inventory of Sheep	Market Value of Sheep (Per Animal)	Per Animal Contribution to Local Economy
Archuleta	\$17,327.02	108	\$160.44	\$417.13
Custer	\$34,654.04	203	\$170.71	\$443.84
Delta	\$3,409,709.78	14,194	\$240.22	\$624.58
Dolores	-	-	-	-
Eagle	\$1,464,133.09	5,171	\$283.14	\$736.17
Garfield	\$2,278,502.98	9,563	\$238.26	\$619.48
Grand	\$24,752.88	137	\$180.68	\$469.76
Gunnison	\$1,866,367.46	7,937	\$235.15	\$611.38
Huerfano	\$6,188.22	18	-	-
Jackson	\$65,595.14	294	\$223.11	\$580.09
La Plata	\$2,047,063.52	9,884	\$207.11	\$538.48
Larimer	\$268,568.79	1,210	\$221.96	\$577.09
Mesa	\$2,876,285.13	14,633	\$196.56	\$511.06
Moffat	\$9,549,662.69	40,408	\$236.33	\$614.46
Montezuma	\$318,074.56	1,535	\$207.21	\$538.76
Montrose	\$3,210,449.07	13,990	\$229.48	\$596.65
Ouray	-	-	-	-
Rio Blanco	\$1,231,455.98	4,998	\$246.39	\$640.61
Routt	\$2,142,362.12	8,519	\$251.48	\$653.85
Saguache	\$548,276.38	4,472	\$122.60	\$318.77
San Miguel	\$68,070.43	310	\$219.58	\$570.91
Total (21 Focal Counties)^b	\$31,427,499.28	137,584	\$228.42	\$593.90

Source: 2017 USDA-NASS Census

^a If publishing a particular data item would identify an operation (for example, if there is only one producer of a particular commodity in a county), NASS does not publish the information. In such cases, the data are suppressed and shown as "(D)," meaning "withheld to avoid disclosing data for individual operations." A dash represents zero, no data for that particular data item. Source: <https://www.nass.usda.gov/AgCensus/FAQ/2022/index.php>

^b Totals omit data for Dolores County and Ouray County.

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4.7.3 Alternative 1

Under alternative 1, gray wolves reintroduced in Colorado would be managed as an experimental population under section 10(j) of the ESA. The section 10(j) rule would specify the allowable take of gray wolves and would include lethal and nonlethal take provisions.

Alternative 1 proposes incorporating the provision in the final rule that permits the management of wolves to address the potential impacts on ungulate populations within the Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands. In this case, the Service and authorized agents would have the ability to use nonlethal and/or lethal measures to manage reintroduced wolves, aligning with the Tribal management objectives on

reservation lands. This provision is limited to reservation lands and does not apply to the Brunot Area or lands owned by Tribes outside the reservations.

Impact on Outdoor Recreation

The impacts on outdoor recreation under alternative 1 would be similar to the impacts described under the no-action alternative. Under alternative 1, the Service and its authorized agents may manage reintroduced wolves to maintain ungulate populations within Tribal conservation goals. Management of wolves would not be permitted for the purpose of protecting ungulate populations outside of reservation lands, but larger ungulate populations within reservations may have beneficial impacts on ungulate populations and hunting in surrounding areas of the state.

Impact on Agriculture and Livestock Production

Under alternative 1, the Service and its designated agents would have the greatest management flexibility in managing wolves that would be reintroduced to mitigate impacts from depredation of livestock. The proposed section 10(j) regulation under alternative 1 would include the entire state of Colorado and authorize lethal and nonlethal take to mitigate wolf-livestock conflicts and manage wolves that recurrently predate livestock. Alternative 1 would reduce long-term costs associated with depredation for livestock producers compared to the no-action alternative, but it may not eliminate indirect economic losses (e.g., loss of revenue from livestock injuries, lower weights at birth and during sale property repairs, time).

Lethal wildlife removal measures are frequently viewed as more efficient and cost-effective than nonlethal wildlife conflict mitigation tools for minimizing cattle predation. Limited studies specific to gray wolves or comparable species are available that assess the cost effectiveness of lethal versus nonlethal conflict mitigation tools (McManus et al. 2015). One nonlethal method of managing wolves that prey on livestock is wolf translocation. Compared to lethal removal, the translocation of wolves away from conflict sites showed advantages and disadvantages. In the earliest periods of the State's wolf reintroduction efforts, when promoting the formation of new packs is a high priority, soft releasing and translocating wolf groups may be beneficial ways to reduce homing behavior, although initially more expensive. Such activities may prove useful for reducing conflicts and laying the groundwork for long-term coexistence promotion within communities (Bradley et al. 2005). Livestock protection dogs or guarding dogs are another nonlethal method used to reduce predation on ranches. There is a lack of quantitative data on the exact effectiveness of guarding dogs primarily because research on their effectiveness in deterring predators from killing livestock has primarily relied on testimonial evidence and producer-based reporting (Davidson and Gehring 2010). Studies show effectiveness from 11 percent to 93 percent reduction in livestock depredation from the use of guard dogs (Coppinger et al. 1998). However, the majority of this research focuses on coyote predation on sheep. One consideration for guarding dogs is that, in most cases, the government does not provide financial support for utilizing them. The livestock producer must incur all financial expenditures connected with using guarding dogs (Davidson and Gehring 2010).

There are some examples of costs associated with lethal versus nonlethal removal measures. In 2014 the Washington Department of Fish and Wildlife spent \$53,221 to manage the Huckleberry Wolf Pack depredation of sheep in Stevens County, Washington, using nonlethal and lethal take strategies (Landers 2014). The costs to mitigate the pack's attack on sheep was split almost evenly between nonlethal and lethal actions. However, nonlethal methods were slightly less costly than lethal take methods. The cost of lethal removal of wolves in states such as Idaho and Washington ranged from approximately \$3,000.00 to \$26,700.00 per wolf. In 2021, the Idaho Department of Fish and Game reportedly killed 22 wolves, incurring costs of a little over \$3,000 per wolf (Western Watersheds Project 2021). In the state of Washington, in 2012, Washington Department of Fish and Wildlife spent \$376,000 on wolf management, of which \$76,500 was for lethally removing six wolves (\$12,750 per wolf) from the Wedge Pack in Colville National Forest repeated livestock depredations (Stevens County

Cattleman's Association 2012). In 2014, Washington Department of Fish and Wildlife paid \$26,671.00 to remove one wolf lethally, and in 2016, it spent \$135,000 to kill seven gray wolves (\$19,285.61 per wolf) from the Profanity Peak Pack for attacking 15 cattle, which was the most expensive lethal removal since the state adopted its wolf recovery plan.

Livestock producers may need to employ several nonlethal and lethal methods to mitigate wolf predation on their livestock. Since alternative 1 would authorize both lethal and nonlethal take, livestock producers would need to weigh the expenses of deploying various take tactics against the economic loss caused by livestock predation. The no-action alternative would prevent livestock producers from the take of wolves that repeatedly prey on their livestock, potentially becoming more costly to livestock producers than alternative 1, under which producers could employ lethal and nonlethal strategies.

4.7.4 Alternative 2

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

Impact on Outdoor Recreation

The impacts on outdoor recreation under alternative 2 would be the same as the impacts described under alternative 1.

Impact on Agriculture and Livestock Production

Under alternative 2, livestock operators within the limited territory of section 10(a)(1)(A) permit would experience impacts similar to those described under the no-action alternative. Ranchers would incur higher direct and indirect costs because they would have fewer take options to manage wolf predation on their livestock. Ranchers outside the 10(a)(1)(A) permit area would have more flexibility in managing conflicts with wolves and impacts in that area would be the same as those described under alternative 1. Like alternative 1, alternative 2 would allow for lethal and/or nonlethal take in most areas of the state except in parts of Jackson County and western Larimer County, 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 population of wolves is found to occupy other areas. Livestock producers in the section 10(a)(1)(A) permit area would only be allowed to use nonlethal forms of take to manage wolf depredation. As a result, these producers may disproportionately incur more direct and indirect costs from wolf depredation than those within the experimental population boundary.

4.8 ENVIRONMENTAL JUSTICE

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

4.8.1 Methodology

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

Environmental justice communities in the statewide study area are identified in section 3.6. Disproportionately high and adverse impacts to these communities are assessed based on the community’s potential exposure to the effects of an alternative. In this case, exposure is determined based on the potential for conflict with wolves that would require management through take under the section 10(j) rule. Potential exposure is likely to be highest in the 21 focal counties that contain suitable ecological conditions to support gray wolves (see section 3.1 for additional discussion of the factors used to determine the focal counties). Focal counties with identified minority environmental justice communities include Eagle, Garfield, Huerfano, Saguache, and Montezuma. Focal counties with low-income environmental justice communities include Delta, Gunnison, Huerfano, La Plata, Larimer, Mesa, Moffat, Montezuma, Montrose, Rio Blanco, Saguache, and San Miguel. Within these counties and the other focal counties, other population groups of concern, including low-income and minority livestock producers and outfitters and guides, as well as members of American Indian Tribes, have a greater risk of experiencing potentially high and adverse impacts. Therefore, the effects analysis focuses primarily on the potential for disproportionately high and adverse impacts to these population groups of concern. While the focal counties are considered locations where conflicts are most likely to occur, the environmental justice analysis considers the entire statewide study area.

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

The analysis of environmental justice impacts considers potential long-term impacts and assumes that wolves could occur in any county throughout the state but are most likely to occur in the focal counties. This EIS uses a population of 200 wolves as a planning estimate, which is the high-end threshold at which the State would delist the gray wolf and manage the species as a delisted, nongame species (see section 2.4). While environmental justice impacts may occur only as isolated incidents (e.g., one-time predation of livestock), the potential for impacts would occur over the long term; therefore, the impacts discussed in this section are considered to be long-term impacts.

4.8.2 No-Action Alternative

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

Changes in populations of ungulate species, as well as depredation of livestock, under the no-action alternative could affect Tribal cultural resources. Potential impacts to Tribal cultural resources are discussed in section 4.6 and could include economic costs as a result of livestock depredation and changes in ungulate herd movements or demand for hunting permits; effects to subsistence hunters; and effects to archaeological and historical resources or natural resources of cultural importance. Management of reintroduced wolves under the no-action alternative would not affect osprey, which are protected by the Southern Ute Indian Tribe or have population-level effects on the black bear, which is honored by the Ute Mountain Ute and Southern Ute Indian Tribes. This alternative may affect archaeological or historical sites and the ability of Ute cultural practitioners to use these sites.

Socioeconomic impacts to Tribes under this alternative would be similar to the impacts discussed below and in section 4.7. 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.

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

The impacts analysis for socioeconomic resources in section 4.7 notes that of the three alternatives, the no-action alternative would result in the highest commercial costs for ranchers because wolves would be managed as a federally listed endangered species, and take of wolves to mitigate repeated depredation of livestock, with the exception of non-injurious, opportunistic harassment that could be authorized under section 10(a)(1)(A) of the ESA, would be prohibited. Studies have found that livestock mortality caused by wolves is a small economic cost to the livestock production industry as a whole (Center for Human-Carnivore Coexistence 2020a; Muhly and Musiani 2009). In the northern Rocky Mountain region (Idaho, Montana, and Wyoming) between 1987 and 2003, the economic costs of livestock mortality caused by wolves accounted for less than 1 percent of annual gross income from livestock operations in the region. During this period gray wolves were managed as federally listed endangered species in the region (Muhly and Musiani 2009).

While wolf depredation in circumstances when take is prohibited results in a relatively small economic cost to the livestock industry, these costs are unevenly distributed and localized in places where wolves establish territories, and costs to individual producers as a result of depredation may be substantial (Center for Human-Carnivore Coexistence 2020a; Muhly and Musiani 2009). Potential direct and indirect costs to livestock producers that may

result from depredation are discussed in section 4.7.2. Individual producers may experience economic costs greater than the average for the industry across Colorado as a result of wolf depredation of livestock and costs associated with implementing nonlethal, non-injurious take strategies. For low-income and minority livestock producers, these costs, as well as indirect economic costs such as those caused by decreased market weights and reduced rate of conception in livestock, could be substantial under the no-action alternative. Therefore, this alternative could result in disproportionately high and adverse impacts to low-income and minority livestock producers, 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.

4.8.3 Alternative 1

Under the statewide section 10(j) rule, gray wolves that would be reintroduced to Colorado would be managed as an experimental population under the section 10(j) rule. Under alternative 1, the final rule would include the provision allowing take of wolves to mitigate potential impacts to ungulate populations on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands. The Service and its designated agents would be able to manage reintroduced wolves using nonlethal and/or lethal take for the purposes of managing big game ungulate species consistent with established Tribal management objectives on reservation lands, if the respective Tribe has determined that wolf interactions are a major driver of population declines. This provision would not apply within the Brunot Area or on lands owned by Tribes outside the reservations, only on reservation lands. Therefore, under alternative 1 across most of the state, impacts on population groups of concern, including Tribes, subsistence hunters, and low-income and minority outfitters and guides would be similar to those described under the no-action alternative. Implementation of the ungulate provision specific to the reservation lands for the Tribes could have a long-term, beneficial effect on big game ungulate species on reservation lands by mitigating the potential for ungulate species to decline below Tribal management objectives as a result of predation by gray wolves.

Under alternative 1, Tribes would be able to conduct wolf management as designated agents of the Service within the experimental population boundary on reservation lands or on those lands under the Tribe's jurisdiction. Tribes would be required to obtain prior approval from the Service before implementing certain management actions as outlined in Chapter 2. Implementation of the section 10(j) rule on reservation lands or lands under a Tribe's jurisdiction would reduce potential impacts if wolves depredated livestock on these lands. While socioeconomic effects on livestock producers still could occur under this alternative, these effects would be mitigated by involving affected Tribes in processes to manage reintroduced wolves in accordance with the section 10(j) rule. Disproportionately high and adverse effects on Tribes could still occur under alternative 1 as a result of potential effects on subsistence hunters and Tribal outfitters and guides; however, implementation of the section 10(j) rule would mitigate potential effects on Tribal livestock producers. With implementation of the provision to allow for the take of wolves impacts ungulates on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands, disproportionately high and adverse effects on Tribes are not expected under alternative 1.

Disproportionately high and adverse effects could occur for low-income outfitters and guides in local areas, including Tribal members who use the Brunot Area for hunting, based on the factors discussed under the no-action alternative. Under alternative 1, these effects would be similar to the effects described for the no-action alternative.

Under alternative 1, the proposed section 10(j) rule would cover the entire state of Colorado and allow non-injurious, injurious, and lethal take under the conditions specified in table 2-2 to reduce conflicts and manage wolves that repeatedly depredate livestock. Direct costs to livestock producers over the long term resulting from depredation would be lower under this alternative, compared to the no-action alternative; however,

implementation of alternative 1 may not fully mitigate against indirect economic losses caused by stresses to livestock (i.e., lower market weights and reduced rate of conception). Livestock producers would also incur costs (i.e., money, time, and labor) for implementing nonlethal take strategies, and these costs may be more substantial for low-income and minority livestock producers. Overall, implementation of alternative 1 would result in a long-term, beneficial impact to low-income and minority livestock producers compared to the no-action alternative. The potential for disproportionately high and adverse impacts to low-income or minority livestock producers would be reduced under this alternative compared to the no-action alternative because livestock producers would be able to implement a range of nonlethal and lethal take strategies to mitigate livestock depredation.

4.8.4 Alternative 2

Under alternative 2, potential effects to population groups of concern, including Tribal members, subsistence hunters, and low-income and minority outfitters and guides from the potential effects of wolves on ungulate populations would be the same as those described under alternative 1 within the proposed experimental population boundary, which would cover most of the state. These effects could be disproportionately high and adverse under alternative 2 but could be mitigated in the experimental population area on Tribal reservation lands with the provision for the take of wolves impacting ungulates on reservation lands.

A portion of the state, potentially including most of Jackson County and the western part of Larimer County (areas within Colorado big game management units 161, 6, 7, 16, 17, and 171) would be covered under a section 10(a)(1)(A) permit that the Service would issue to the State of Colorado under alternative 2. The section 10(a)(1)(A) permit would not allow for lethal take of wolves, and effects to population groups of concern, including low-income and minority outfitters and guides, in the 10(a)(1)(A) permit area would be similar to those described under the no-action alternative and could be disproportionately high and adverse. There are no Tribal reservation lands in these areas, so disproportionately high and adverse impacts to Tribes or Tribal members in the 10(a)(1)(A) area are not expected.

Under alternative 2, impacts to low-income and minority livestock producers and Tribal members on Tribal reservation lands in areas within the section 10(j) experimental population boundary would be the same as those described for alternative 1. In areas covered under the section 10(a)(1)(A) permit, only nonlethal take measures, including injurious take and translocation, would be allowed to address depredation on livestock. Several incidents of the existing group of gray wolves in northern Colorado depredating livestock have been documented in Jackson County (Blumhardt 2022). Proactive, nonlethal strategies can reduce the potential for livestock depredation. However, some tactics, such as fladry (i.e., a nonlethal tool designed to protect livestock from predation by creating a visual barrier to wolves) or other physical or psychological barriers, may only be effective temporarily, and there are costs to planning and implementing these strategies. Low-income and minority livestock producers may have fewer financial resources available to implement nonlethal take strategies or may be less likely to use government programs to manage depredation risks. 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.

4.9 CUMULATIVE IMPACTS AND OTHER CONSIDERATIONS

4.9.1 Cumulative Impacts

CEQ regulations stipulate that the cumulative effects analysis within an EIS should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes

such actions” (40 CFR 1508.7). CEQ interprets this regulation as referring only to the cumulative impact of the direct and indirect effects of the proposed action and its alternatives when added to the aggregate effects of past, present, and reasonably foreseeable future actions (CEQ 2005).

Cumulative impacts were determined by combining the impacts of each alternative with the impacts of other past, present, and reasonably foreseeable future actions. In other words, the proposed action by itself may not result in significant impacts. The cumulative impacts analysis asks the question, when the impacts of the proposed action are considered with the impacts of other actions in the area (the cumulative impact scenario), would there be significant impacts? Therefore, it was necessary to identify other past, ongoing, or reasonably foreseeable future projects and plans within the area of analysis, and if applicable, the surrounding region. Past actions are those that have occurred or have been occurring related to the gray wolf, and reasonably foreseeable future projects are those that are likely to occur within the life of the plan. Following CEQ guidance, past actions were included, “to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for the actions and its alternatives may have a continuing, additive, and significant relationship to those effects” (CEQ 2005).

Relevant past, present, and reasonably foreseeable future actions that in combination with the proposed action have the potential for cumulative impacts are regulatory actions and reintroduction efforts related to wolf species in Colorado and the surrounding region. Actions, and a description of those actions that have been included in the cumulative impacts analysis are described in the following section. Other types of actions, including construction, transportation, energy and mineral extraction, and other development projects, have not been included in the analysis. The proposed action, as a regulatory action, would not have the potential to cause adverse cumulative impacts to the resources analyzed in this EIS with these types of actions. For instance, the State Plan to reintroduce and manage gray wolves in Colorado might result in cumulative effects to an elk population in combination with a proposed development project because of the added pressures on that population from increased predation and loss of habitat. However, take of individual wolves to mitigate predation impacts to elk populations would not contribute to adverse cumulative effects on that population.

The cumulative impact analysis used the following four steps:

- Step 1 — Identify Resources Affected

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

- Step 2 — Set Boundaries

Identify an appropriate spatial and temporal boundary for each resource. The temporal boundaries generally extend from when wolves were extirpated in Colorado through the life of the proposed action (limited to those future actions where impacts could be reasonably predicted). The spatial boundary may vary depending on the resource analyzed and the area affected by other past, present, and reasonably foreseeable actions. The spatial and temporal boundaries for each resource area are defined below.

- Step 3 — Identify Cumulative Action Scenario

Determine which past, present, and reasonably foreseeable future actions to include for each resource. Reasonably foreseeable future actions include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a reasonable official would take such activities into account in reaching a decision. These activities include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified. Reasonably foreseeable future actions do not include those actions that are highly speculative or indefinite (43 CFR 46.30).

- **Step 4 — Cumulative Impact Analysis**

Assess impacts of these other actions plus impacts of each alternative, to arrive at the total cumulative impact of each alternative and each alternatives contribution. This analysis is included below. For this specific effort, the analysis below focuses on the Preferred Alternative, alternative 1. Generally, the differences in impacts between the two action alternatives evaluated in this EIS are not to an extent that the overall cumulative impact conclusions would be different. Conditions under the no-action alternative are equivalent to the State of Colorado's wolf reintroduction effort, which is incorporated in the cumulative impacts analysis as a separate action. Regardless of the alternative chosen, taking, or not taking a regulatory action would constitute a small part of the overall cumulative impact.

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

The discussion of cumulative impacts in the sections below follows a different organization than that of the direct and indirect impact analyses earlier in this chapter. The following section first identifies the other past, present, and reasonably foreseeable future actions included in the cumulative impact analysis and briefly describes the actions on which the cumulative impact analysis is based. Following this description of the past, present, and reasonably foreseeable future actions, the cumulative impacts analysis in section 4.9.2 for each resource is presented. Under each of the resources analyzed, the spatial and temporal boundaries for the analysis are defined. Following this definition, the impact of each past, present and reasonably foreseeable future action is described. Once these individual actions are described, the impact of all of these actions is considered with the impact of the proposed action to describe the overall cumulative impact. This analysis is presented in the following subsections:

- *Spatial and Temporal Boundaries* identifies the boundaries for assessing cumulative impacts to that resource.
- *Impacts from the State Plan* defines the impacts to a resource that are expected to result from the State's reintroduction of gray wolves. These impacts are identified separately to assist decisionmakers in understanding this action's contribution to cumulative impacts on a resource.
- *Impacts from Mexican Wolf Reintroduction* defines the impacts to a resource that are expected to result from reintroduction of Mexican wolves in New Mexico and Arizona to illustrate this action's contribution to cumulative impacts.
- *Impacts from the Proposed Action* are summarized for the same reason, to illustrate the proposed action's contribution to cumulative impacts under the action alternatives.
- The *Cumulative Impact* subsection for each resource area analyzes the cumulative impacts to a resource expected to result from implementation of the proposed action (either of the action alternatives) in combination with the other past, present, and reasonably foreseeable actions identified below. The cumulative impact analysis considers the effects of each action and interactions between all of these actions.

Past, Present, and Reasonably Foreseeable Future Actions

The State of Colorado Gray Wolf Reintroduction

Proposition 114, now Colorado Revised Statue 33-2-105.8, which directs the CPW Commission to take the steps necessary to begin reintroductions of gray wolves to a portion of the species' historical range in Colorado by

December 31, 2023, passed on November 3, 2020. The State Plan, approved by the CPW Commission in May 2023, details plans for the State's reintroduction effort, which CPW would undertake in cooperation with federal agencies; potentially affected Tribes; and the states of Idaho, Montana, Oregon, Washington, and/or Wyoming where wild wolves would be captured and transferred to Colorado via agreement. The plan states that wolf reintroduction efforts would require the transfer of about 30 to 50 wolves over a 3- to 5-year period from the northern Rocky Mountain states, with assistance from other state wildlife management agencies. Based on the Technical Working Group recommendations, CPW would aim to capture 10 to 15 wild wolves annually from several different packs over the course of 3 to 5 years by trapping, darting, or net gunning in the fall and winter. These captures may be done by agency staff, contractors, or private trappers. The total number of wolves relocated in any year and in total would depend on capture success, continued participation by the cooperating states, and the degree to which relocated animals remain in Colorado and survive. Post-release monitoring would occur and use GPS collars to inform managers on survival and dispersal, as well as inform future release protocols.

After the release of 30 to 50 animals over the 3-to 5-year timeframe, active reintroduction would stop, and post-release monitoring would inform State managers if the effort to establish a self-sustaining wolf population in Colorado has been successful. The following established set of benchmarks would be used to evaluate the short-term success of wolf reintroduction efforts:

- Reintroduced wolves demonstrate a high rate of survival in the first six months after release;
- Released wolves demonstrate low mortality rates over the initial two to three years post-release;
- Wolves remain in Colorado;
- Reintroduced wolves successfully form pairs and reproduce, establishing packs; and
- Wolves born in Colorado survive and also successfully reproduce.

If parameters are measured that indicate a growing population that no longer needs supplemental active reintroductions and the wolf population demonstrates a positive growth rate from natural reproduction, the wolf population would be managed to grow naturally toward recovery levels as stated in Chapter 4 of the State Plan. If population growth is stable or negative, or a high rate of mortality is documented, active augmentation would be reinitiated (after evaluating what led to the initial unsuccessful result).

The State Plan proposes management of wolves based on a phased approach, based on the number of animals present in the state. There are three phases of management with wolves listed as State endangered in phase 1, State threatened in phase 2, and State delisted in phase 3. Throughout these phases the State will focus on using "impact-based" management within an adaptive management framework that would allow the State the maximum flexibility to manage wolves while learning how they affect Colorado's ecosystems. Table 3 in the State Plan details a range of management tools that could be used in impact-based management, including detailing proposed compensation for livestock producers that experience wolf depredation of livestock.

Mexican Wolf Reintroduction

The Mexican wolf, a subspecies of gray wolf, evolved in the high-elevation mountains of Mexico and small island mountain habitats of the desert southwest; mostly separated from other wolf subspecies to the north by fragmented habitat and discontinuous prey distribution (Heffelfinger et al. 2017a,b). The Mexican wolf is listed as an endangered species protected by the ESA. In 2015, the Service changed the status of the Mexican wolf from being listed together with all other subspecies of gray wolf to being listed as endangered as a separate entity under the ESA. The separate listing of the Mexican wolf is supported by all genetic (Vila et al. 1999; vonHoldt et al. 2011) and physical morphometric analyses conducted (Bogan and Mehlhop 1983; Hoffmeister 1986; Nowak

1995). In the United States, the Service is the federal agency responsible for the recovery of the Mexican wolf. A central focus of recovery efforts for the Mexican wolf has been the reintroduction of the Mexican wolf to the wild from captivity due to the extirpation of the Mexican wolf in the wild prior to ESA protection.

Historically, Mexican wolves were associated with montane woodlands characterized by sparsely to densely forested mountainous terrain and adjacent grasslands in habitats found at elevations of 4,500 to 5,000 feet. Mexican wolves were known to occupy habitats ranging from foothills characterized by evergreen oaks (*Quercus* spp.) or pinyon (*Pinus edulis*) and juniper (*Juniperus* spp.) to higher elevation pine (*Pinus* spp.) and mixed conifer forests. Factors making these habitats attractive to Mexican wolves likely included prey and water availability. White-tailed deer and mule deer were believed to be the primary sources of prey (Bailey 1931; Leopold 1959; Bednarz 1988), and Mexican wolves may have consumed more vegetative material and smaller animals than gray wolves in other areas, similar to coyotes in southern latitudes (Hidalgo-Mihart et al. 2001). Currently, elk are the primary prey of Mexican wolves, and the difference between historical versus current prey preference in the United States is likely due to the lack of elk in large portions of historical Mexican wolf range.

Mexican wolf historical range (Nelson and Goldman 1929; Young and Goldman 1944; Nowak 1979, 1995, 2003), is supported by best available science on ecological relationships, physiography, wolf morphology, and the principles of population genetics (Heffelfinger et al. 2017a; Martinez-Meyer et al. 2021). The northern boundary of Mexican wolf probable historical range was previously considered to extend just over the present-day border between Mexico and the United States (Heffelfinger et al. 2017a). An expanded Mexican wolf probable historical range map developed by Parsons (1996) added a 200-mile northward extension of the core historical range and was adopted and included in the 1996 Final EIS (USFWS 1996) prior to the release of the first Mexican wolves in the United States. The Service acknowledges that intergradation zones between Mexican wolves and other gray wolf populations likely occurred in central Arizona and New Mexico (Bogan and Mehlhop 1983; Heffelfinger et al. 2017a) as reflected in the expanded historical range map developed by Parsons (1996). The Service continues to recognize the concordance in the scientific literature depicting the Sierra Madre of Mexico and southern Arizona and New Mexico as Mexican wolf core historical range and will continue to recognize the expanded range as per Parsons (1996) that extends into central New Mexico and Arizona (USFWS 1996).

Mexican wolf recovery in the United States is currently occurring in areas approximately 200 miles north of the Mexican wolf core historical range (USFWS 1996). In 2015, the Service revised the Mexican wolf 10(j) area and expanded the area of Mexican wolf recovery to include all of Arizona and New Mexico south of Interstate 40 to the Mexican border (USFWS 2015). The Service is conducting the reintroduction of the Mexican wolf under section 10(j) of the ESA and regulations at 50 CFR 10.17.81. The Service began reintroducing captive-bred Mexican wolves into the Mexican Wolf Experimental Population Area (MWEPA) in Arizona and New Mexico in 1998 pursuant to its January 12, 1998, rule (63 FR 1752; see figure 4-1).

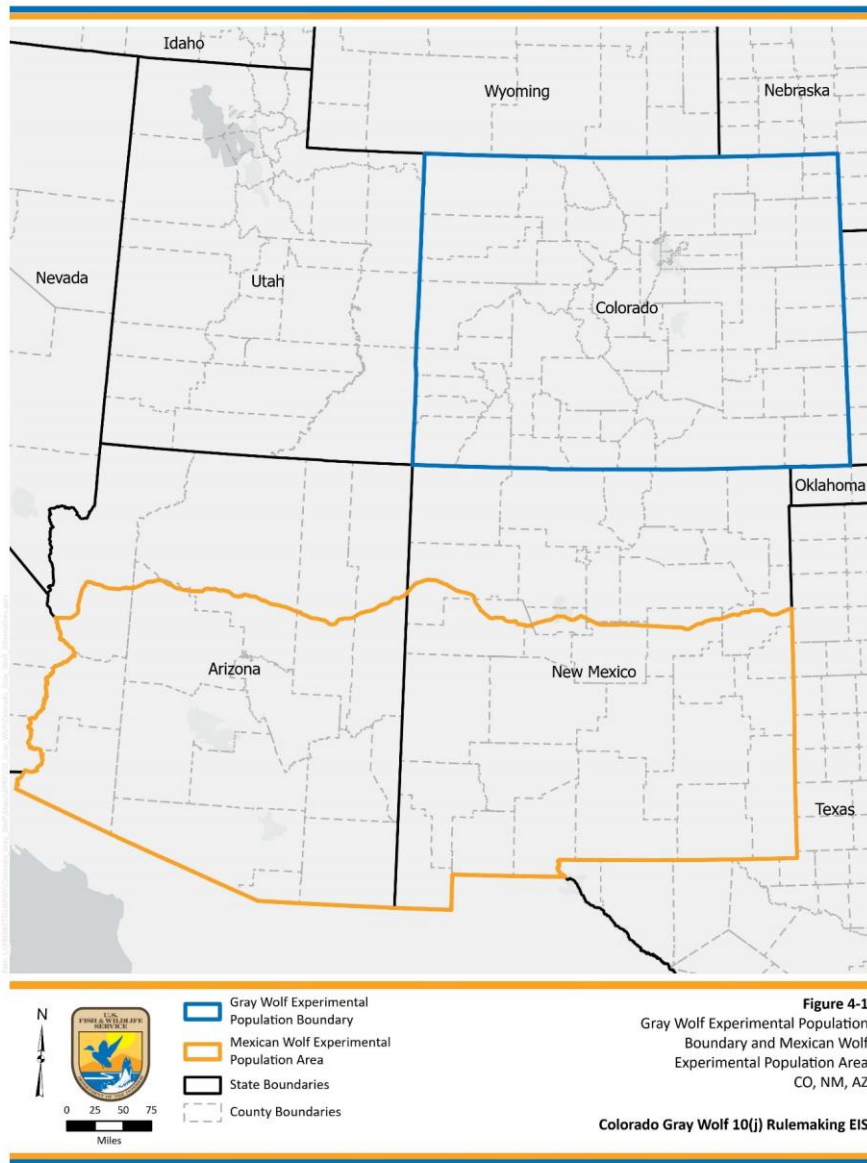
In 2022, the Service finalized the *Mexican Wolf Recovery Plan, Second Revision* (revised recovery plan; USFWS 2022g) in coordination with federal agencies in Mexico and state, federal, and Tribal agencies in the United States. The revised recovery plan specifies that the recovery goal for the species is “to conserve and protect the Mexican wolf and its habitat so that its long-term survival is secured, populations are capable of enduring threats, and it can be removed from the list of threatened and endangered species” (USFWS 2022g). Recovery objectives for the Mexican wolf as identified in the plan are as follows:

1. Increase the size of two Mexican wolf populations;
2. Improve gene diversity and maintain the health of Mexican wolves;
3. Ensure adequate habitat availability to support viable Mexican wolf populations;

4. Maintain the Mexican Wolf Species Survival Plan captive breeding program to improve the status of wild populations;
5. Promote Mexican wolf conservation through education and outreach programs; and
6. Ensure recovery success.

The revised recovery plan provides a strategy, criteria, and actions to recover the Mexican wolf and solidifies the significant role of the MWEPA in the recovery of the Mexican wolf. The revised recovery plan clarifies the specific contribution needed from the MWEPA for the rangewide recovery of the Mexican wolf by establishing demographic, genetic, and regulatory recovery criteria for a population of Mexican wolves in the United States. The revised recovery plan also calls for a second population of Mexican wolves in Mexico and provides criteria for that population (USFWS 2022g).

The status of the Mexican wolf population in the MWEPA has improved under the 2015 10(j) rule. The end of year census for 2022 generated a minimum abundance of 241 Mexican wolves in the wild (136 in New Mexico and 105 in Arizona). This was a 23 percent increase in the population from the 2021 end of year census (USFWS 2023). Mexican wolves have expanded their range under the 2015 10(j) rule, from 7,255 square miles (18,790 square kilometers) in 2014 to 19,495 square miles (50,492 square kilometers) in 2020. Based on this numeric and geographic expansion, the Service considers the MWEPA population to be stable and growing steadily, which is consistent with the ongoing demographic recovery needs of the Mexican wolf. Illegal killing of Mexican wolves continues to occur in the MWEPA, but population growth has been robust in recent years despite these losses. The Service continues to investigate illegal killings, increase the presence of law enforcement, and conduct community outreach and education to address this problem (USFWS 2022h).



4.9.2 Cumulative Impacts Analysis

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

Spatial and Temporal Boundaries

The spatial boundary for cumulative impacts to biological resources (including gray wolves, special status species, and other wildlife) includes Colorado and neighboring states, specifically Arizona and New Mexico, which encompass the MWEPA. The temporal boundary extends from the beginning of the Service's Mexican wolf reintroduction effort in 1998 through the life of the proposed action.

Impacts from the State Plan

The State of Colorado's reintroduction of the gray wolf would benefit the species, which was extirpated from Colorado by the mid-1940s by government-sponsored predator control programs (Ditmer et al. 2022). Reintroducing the gray wolf, a federally endangered species in 44 states, into a portion of its native historical range in Colorado would promote recovery by increasing connectivity across different regions that were historically and are currently occupied by wolves, resulting in long-term, beneficial impacts to the species. Reintroducing gray wolves in Colorado could also affect other wildlife, including other federally listed species, state-listed species, and other SGCN. Wolves are apex predators, meaning that they occupy the top trophic level in food webs. The reintroduction of wolves could affect other species in the state directly, through predation and competition, or indirectly through behavioral changes. Effects could be both adverse and beneficial.

The preferred donor population for the proposed reintroduction of gray wolves to Colorado is the delisted northern Rocky Mountains population, found in Idaho, Montana, eastern Oregon, eastern Washington, and Wyoming. Gray wolves in these states are managed by State fish and wildlife agencies and Tribes. These wolves are an appropriate source for the Colorado reintroduction because of similarities in habitat and preferred prey; at least one member of the current pack in Colorado dispersed from the northern Rocky Mountains population; and the northern Rocky Mountains population reached numerical, spatial, and temporal recovery goals by the end of 2002 (USFWS 2020d). The northern Rocky Mountains wolf population continues to demonstrate stable to slightly increasing demographic trends, with an estimated 1,337 wolves in Idaho as of August 2022 (Idaho Department of Fish and Game 2023) and an estimated 1,087 gray wolves in Montana at the end of the 2022 (Parks et al. 2023). In addition, the most recent year-end minimum counts for 2022 indicated at least 338 gray wolves in Wyoming, 216 wolves in Washington, 178 wolves in Oregon, and 18 in California (California Department of Fish and Wildlife 2022; Oregon DFW 2023; Washington DFW et al. 2023; Wyoming GFD et al. 2023). Further, the northern Rocky Mountains population is part of a larger metapopulation of wolves that encompasses all of western Canada (USFWS 2020d). Given the demonstrated resilience and recovery trajectory of the northern Rocky Mountains population and limited number of animals that would be collected, negligible negative impacts on the donor population are expected.

If donor wolves from the western United States are not available, another possible source of gray wolves for the Colorado reintroduction may be the wolf population in the western Great Lake states of Michigan, Minnesota, or Wisconsin. Wolves in Minnesota are currently listed as threatened under the ESA, while wolves in Michigan and Wisconsin are listed as endangered. The western Great Lakes region has nearly 4,400 wolves (Erb and Humpal 2021; Michigan DNR 2022; Wisconsin DNR 2022) and are part of a larger metapopulation of wolves that extends into central and eastern Canada. As a result, the capture, transport, and reintroduction to Colorado of approximately 30 to 45 gray wolves over a 2- to 3-year period would have little to no effect on the wolf population in Michigan, Minnesota, or Wisconsin.

Wolves are native to Colorado and their reintroduction could benefit some species, such as small mammals and birds, by indirectly reducing predation pressure through competition or interactions with other predators, such as

coyotes (Smith et al. 2003; Ripple and Beschta 2012). Wolves may compete with other predators for food resources, hunting territory or home range, or other limiting resources. In the presence of wolves, other predators may change their behaviors (e.g., prey selection and hunting ranges) to avoid areas where wolves are present, as was observed in mountain lions following the reintroduction of wolves at Yellowstone National Park (Bartnick et al. 2013). However, because wolves are also predators, their reintroduction could place additional predation pressure on some species, especially ungulates such as elk, deer, and moose. Wolf presence may or may not influence changes in ungulate population dynamics. Prey populations naturally vary through time in response to environmental factors (e.g., severe winters, natural mortality), predation pressure by carnivores (in Colorado, wolves would compete primarily with black bears and mountain lions), hunter harvest pressure, and habitat conditions. Ungulate populations could experience localized population declines in the short term due to increased predation pressure from wolves. However, it is likely that populations would stabilize over the long term, as was observed at Yellowstone National Park in the years following gray wolf reintroduction (Smith et al. 2003), so long-term, adverse effects are not anticipated. In parts of Europe and Asia, wolves have been reported to prey on wild horses (Van Duyn et al. 2009; Dorj and Namkhai 2013; López-Bao et al. 2013). However, wolves tend to target wild horses when prey resources (e.g., smaller ungulates) are depleted (Van Duyn et al. 2009). Because elk and deer, the preferred prey species for gray wolves in the northern Rocky Mountains, are abundant in Colorado, impacts on wild horses are not expected.

Reintroducing gray wolves in Colorado could place additional pressure on some federally listed species, including Gunnison sage-grouse and Canada lynx, through predation and competition. However, the TWG concluded in its final recommendations to CPW that, “The presence of wolves will not have an impact on populations of threatened and endangered species in Colorado, specifically lynx and Gunnison sage grouse” (TWG 2022c). Cooperating agencies in the development of this EIS expressed concern that gray wolves reintroduced to Colorado under the State Plan could adversely affect Mexican wolf populations in neighboring Arizona and New Mexico if gray wolves disperse outside Colorado. Potential effects of the State Plan on these species are described below.

Reintroducing gray wolves in Colorado could place additional predation pressure on ground-nesting birds including the federally threatened Gunnison sage-grouse. Sage-grouse populations in Colorado (both Gunnison sage-grouse and greater sage-grouse) have declined sharply since 1980 in the absence of wolves. The main drivers of population decline are believed to be habitat loss, fragmentation, and degradation (Braun 1998; USFWS 2019). As noted in the Service’s 2019 Species Status Assessment Report for Gunnison Sage-grouse (USFWS 2019), predation is a cause of mortality of young age classes and adults on leks, on nests, and during winter. Common predators include raptors, ravens, foxes, coyotes, ground squirrels, weasels, and other birds and small mammals (Young et al. 2015a; USFWS 2019). However, Gunnison sage-grouse have co-evolved with a variety of predators, and their cryptic plumage and behavioral adaptations have allowed them to persist despite this mortality factor (Schroeder et al. 1999; USFWS 2019). Although predation could have localized impacts, it has not been documented as a primary driver of Gunnison sage-grouse population decline and is not considered to be a barrier to recovery success (Gunnison Sage-grouse Rangewide Steering Committee 2005; USFWS 2020c). Gray wolves are not known to target Gunnison sage-grouse as prey.

Gray wolves may compete with Canada lynx, which is also a native predator in Colorado, for prey and hunting territory and are also considered to be potential predators of lynx (USFWS 2017b). Although empirical data are lacking and would be difficult to acquire, the lynx’s physical adaptations are thought to provide a seasonal advantage over potential terrestrial competitors and predators that generally have higher foot-loading, causing them to sink into the snow more than lynx (Buskirk et al. 2000; USFWS 2017b). The ranges of wolves and lynx overlap considerably worldwide; however, interactions between the two species have rarely been documented, making it difficult to predict the effects of wolf reintroduction (Ballard et al. 2003). Reintroduction of wolves has

not resulted in the disappearance of lynx elsewhere, including at Yellowstone National Park (Murphy et al. 2006). Canada lynx population and distribution are strongly linked with abundance of prey species, such as snowshoe hare (Hodges et al. 2009). The Service listed the Canada Lynx Contiguous U.S. Distinct Population Segment, which includes Colorado, as threatened in 2000 because of the potential for impacts to lynx habitat conditions and the availability of snowshoe hare and other prey populations (USFWS 2017a). The extent to which predation and competition may influence lynx populations in the Distinct Population Segment remains uncertain (USFWS 2017b). However, predation and competition have not been documented as driving factors for lynx population decline and are not considered barriers to recovery success (USFWS 2017a).

Establishing an experimental population of northern gray wolves in Colorado would increase the connectivity of northern gray wolves to Mexican wolves if the ranges of both species expand and eventually overlap. Gray wolves reintroduced to Colorado under the State Plan could disperse outside Colorado, potentially resulting in adverse impacts to endangered Mexican wolves from competition or interbreeding (hybridization) (Odell et al. 2018). Mexican wolves have been reintroduced to Arizona and New Mexico. If the ranges of the species overlap, gray wolves would likely dominate Mexican wolves, which are physically smaller, and gray wolves (and their hybrid offspring) would occupy breeding positions, particularly in areas where elk is the primary prey (MacNulty et al. 2009; Odell et al. 2018). Interbreeding between gray wolves and Mexican wolves could result in genetic swamping of the Mexican wolf population, potentially threatening the genetic integrity of the Mexican wolf population (Odell et al. 2018).

Although wolves are noted for long-range movements and genetic interchange among distant populations, even as far as 678 miles (Wabakken et al. 2007), few wolves originating from the north have been documented in northern Arizona and New Mexico (Jimenez et al. 2017). To date, at least two gray wolves have dispersed into northern Arizona and New Mexico from more northerly breeding populations. In October 2014, a 2-year-old female wolf collared near Cody, Wyoming, was documented on the Kaibab Plateau in northern Arizona. In July 2008, a wolf with black pelage (fur) was documented near the Vermejo Park Ranch in northern New Mexico that was assumed to be a wolf from the northern Rocky Mountains since no black-phase (black-furred) Mexican wolf has ever been documented (Odell et al. 2018). Mexican wolves have dispersed into these areas as well (approximately one documented per year).

If gray wolf reintroduction efforts in Colorado are successful, higher numbers of breeding pairs in Colorado would increase the potential for dispersal outside the state. The wild Mexican wolf population in the United States is approximately 350 miles from the proposed population release sites in Colorado, a distance that is within the known travel distance for wolves (Jimenez et al. 2017).

Maintaining genetic integrity has been a critical challenge for other endangered canids, notably the eastern red wolf (*C. rufus*, Kelly et al. 1999). The loss of genetic integrity of Mexican wolves by hybridization with northern wolves would impede recovery efforts of the separately listed Mexican wolf. Best available information suggests the risk of loss of genetic integrity is particularly high during early phases of Mexican wolf recovery, when the number of wolves on the ground in recovery areas is relatively small. Dispersing gray wolves will either find a mate and form a new pack (Jimenez et al. 2017) or are adopted into existing packs (Boyd et al. 1995) and can assume vacant breeding positions (Fritts and Mech 1981; Stahler et al. 2002; vonHoldt et al. 2008; Sparkman et al. 2012), usurp an existing breeder (Messier 1985; vonHoldt et al. 2008), or bide their time to ascend to breeding positions (vonHoldt et al. 2008). Body size is an important determinant of individual fitness and a driving evolutionary force (Baker et al. 2015). Stahler et al. (2013) demonstrated that body mass of breeders was the main determinant of litter size and survival of the litter. Hunting success is also tied directly to larger body size, which has obvious fitness advantages (MacNulty et al. 2009). This physical superiority offers an advantage for northern wolves obtaining and defending breeding positions in the small Mexican wolf population.

In addition to a body size differential, several demographic characteristics of the current wild Mexican wolf populations make them vulnerable to loss of genetic integrity by admixture of northern wolves. When wolf populations have high rates of mortality, the social turmoil results in a higher rate of acceptance of wolves dispersing from other packs (Ballard et al. 1987; Mech and Boitani 2003). Ballard et al. (1987) noted that 21 percent of dispersing wolves were accepted into other packs. Immigrating wolves are also more readily adopted by smaller packs where additional individuals, especially males, increase hunting efficiency and survival of existing pack members (Fritts and Mech 1981; Ballard et al. 1987; Cassidy et al. 2015). The wild U.S. population of Mexican wolves has consistently maintained a relatively small pack size (mean = 4.1, 1998–2016, USFWS 2017c). At the end of the last published reporting period (December 31, 2021), mean pack size was 4.3 wolves (USFWS 2022f). This suggests that Mexican wolves may more readily accept immigrating wolves from the north. Inbreeding avoidance in wolves has been well-documented, where wolves more readily mate with unrelated wolves (vonHoldt et al. 2008; Geffen et al. 2011; Sparkman et al. 2012). The current wild populations of Mexican wolves have inbreeding levels higher than most wolf populations (USFWS 2017c), which means a new wolf immigrant, unrelated to all Mexican wolves, would have a disproportionately high probability of attaining a breeding position (vonHoldt et al. 2008; Geffen et al. 2011; Åkesson et al. 2016).

Potential impacts of the State Plan on Mexican wolves depend on assumptions of dispersal of gray and Mexican wolves, gray wolf reintroduction success and method in Colorado, the ability to track wolves in both populations, growth rates of both populations, and management strategies that are implemented to keep gray and Mexican wolf populations separate. The State of Colorado released its final plan (State Plan) on May 3, 2023; the plan states that release sites of reintroduced wolves would be located a minimum of 60 miles from the borders of Wyoming, Utah, New Mexico, and sovereign Tribal lands in southwest Colorado to reduce the risk of immediate post-release long-distance dispersals (CPW 2023a), which has been documented elsewhere (Fritts et al. 2001). However, because of uncertainties related to wolf dispersal, it is difficult to determine with any degree of certainty the timing and extent of future dispersal contact that may occur between gray wolves and Mexican wolves. Both male and female wolves have been recorded dispersing in all directions, in all seasons, and over various distances (Jimenez et al. 2017). The Service will work with states to minimize impacts to Mexican wolf recovery, including through federal permitting mechanisms or other tools. To minimize interactions and protect Mexican wolf genetic integrity, the Service will simultaneously issue a 10(a)1(A) permit to be held by the Service as a separate action, authorizing state, federal, and Tribal partners to assist in the capture and return of wolves originating from the Colorado experimental population. Recovery permits, such as the 10(a)1(A) permit noted above, are categorically excluded from NEPA under FWS Categorical Exclusion C(1)[516 DM 8.5], except under extraordinary circumstances.

Impacts from Mexican Wolf Reintroduction

The reintroduction of the Mexican wolf would result in direct beneficial impacts to the Mexican wolf population, consistent with the species recovery goal of the revised recovery plan (USFWS 2022g). As described above, if the ranges of gray wolves and Mexican wolves expanded and eventually overlapped, the Mexican wolf population could be adversely affected by interspecific competition and hybridization (Odell et al. 2018). Mexican wolf reintroduction has been limited to the species' historical range, which includes portions of Arizona and New Mexico. Colorado is outside this historical range. If Mexican wolves disperse northward of their historical range, or if gray wolves disperse southward, competition or interbreeding could occur. However, the Service will work with states to minimize impacts to Mexican wolf recovery, including federal permitting mechanisms or other tools. Therefore, adverse impacts to the Mexican wolf population are not expected.

The 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf* reports that increased predation pressure from Mexican wolves could adversely affect ungulate populations but finds that these impacts would be less than significant. The 2022 EIS reports at the

time of publication that there were no data suggesting that Mexican wolves were currently having a significant or observable negative impact on prey populations (USFWS 2022h); therefore, it is expected that such impacts may occur at larger Mexican wolf population sizes and higher wolf densities than the current situation. The 2022 EIS did not evaluate effects to other wildlife including other federally or state-listed species.

Impacts from the Proposed Action

Under the proposed action, gray wolves that are reintroduced to Colorado would be designated across the entire state of Colorado as an experimental population under section 10(j) of the ESA. If the population is designated as nonessential, take prohibitions and consultation requirements under the ESA would be relaxed, such that allowable take would include non-injurious, nonlethal conflict minimization practices, potentially injurious hazing techniques, translocation, and lethal take. Alternative 1 could result in adverse impacts to individual wolves through regulated take and could delay recovery in the short term but is not expected to hinder recovery or have adverse population-level effects in the long term. The management approach would support wolf reintroduction goals while resolving conflicts when and where they occur.

Allowing nonlethal and lethal take of wolves in limited circumstances as proposed under alternatives 1 and 2 is not expected to negatively affect gray wolf habitat and connectivity outside Colorado because there would continue to be natural emigration and immigration from packs in the northern Rockies. It is likely that individual wolves from adjacent populations would continue to disperse into Colorado, where they would be managed under the regulations of section 10(j). Some wolves may naturally disperse out of Colorado to states where they remain federally listed as an endangered species. However, given the amount of ecologically suitable habitat and prey availability in Colorado, ongoing management actions (lethal and nonlethal) under alternative 1 are not expected to have population-level impacts in the long term.

Management flexibility for wolves that would be reintroduced to Colorado under the proposed action, which includes the use of a section 10(j) rule, would not include provisions for the take of wolves for the purposes of protecting or managing species of special concern. As such, there is potential that the reintroduction of wolves could affect biological resources including other wildlife species of special concern. However, the proposed action is not likely to adversely affect species of special concern because substantial population declines of species of special concern have not been documented as a result of previous wolf reintroductions elsewhere in North America. The Service would work with states to minimize impacts to Mexican wolf recovery, including federal permitting mechanisms or other tools. To minimize interactions and protect Mexican wolf genetic integrity, the Service would simultaneously issue a 10(a)1(A) permit to be held by the Service as a separate action, authorizing state, federal, and Tribal partners to assist in the capture and return of wolves originating from the Colorado experimental population.

Ungulate populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. Under alternatives 1 and 2, the final rule would include the provision allowing take of wolves to mitigate potential impacts to ungulate populations on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands. The Service and its designated agents would be able to manage reintroduced wolves using nonlethal and/or lethal take for the purposes of managing big game ungulate species consistent with established Tribal management objectives on reservation lands, if the respective Tribe has determined that wolf interactions are a major driver of population declines. Outside reservation lands, there could be short- or long-term, adverse impacts to prey populations because the Service and its designated agents would not have the ability to manage wolves for the purposes of managing other wildlife populations for conservation, and declines could result in ungulate populations stabilizing below management objectives in the short and/or long term. However, it is possible that no adverse effects would occur because although elk and deer populations may decline in the short term at the local level in response to wolf predation, it is likely these populations would stabilize at the population

objectives over the long term (due to natural fluctuations), as was observed at Yellowstone National Park in the years following gray wolf reintroduction (Smith et al. 2003).

Cumulative Impact

When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably foreseeable future actions, direct and indirect impacts on biological resources would be mostly beneficial. Wolves may reduce predation pressure on some prey species by causing other predators to change their hunting behaviors. Wolves would predate wild ungulate species and could cause their populations to decline in local areas. The proposed action would not contribute to adverse cumulative effects on ungulate species.

Ecosystem Dynamics

Spatial and Temporal Boundaries

The spatial boundary for cumulative impacts to ecosystem dynamics (including gray wolves, special status species, and other wildlife) includes Colorado and neighboring states, specifically Arizona and New Mexico, which encompass the MWEPA. The temporal boundary extends from the beginning of the Service's Mexican wolf reintroduction effort in 1998 through the life of the proposed action.

Impacts from the State Plan

Reintroduction of the gray wolf in Colorado could affect community structure and ecosystem dynamics in the state. As an apex predator, wolves can have a strong top-down effect on the trophic structure of ecosystems by regulating other wildlife populations through predation and behavioral responses, potentially resulting in trophic cascades (Estes et al. 2011; Ripple and Beschta 2012; Ripple et al. 2014). This process is described in greater detail in section 3.2.1. Beneficial changes in ecosystem structure and dynamics following reintroduction or natural recolonization of wolves have been observed in other ecosystems in the United States and Canada (McLaren and Peterson 1994; Hebblewhite et al. 2005; Callan et al. 2013). However, the role of wolves in these observed changes is a matter of debate. Reintroducing wolves to Colorado could directly and indirectly benefit ecosystem dynamics over the long term, as has been observed in other ecosystems where wolves have been reintroduced or naturally recolonized. However, because ecosystems in which wolf reintroduction has previously occurred differ greatly, and because there is no precedent for reintroduction of wolves on a statewide scale, there is a great deal of uncertainty surrounding the potential effects of the State Plan on ecosystem dynamics throughout Colorado.

Impacts from Mexican Wolf Reintroduction

The 2022 *Final Supplemental EIS for the Proposed Revision to the Regulations for the Nonessential Experimental Population of the Mexican Wolf* does not evaluate impacts on ecosystem dynamics as a stand-alone resource topic. However, the supplemental EIS does state that Mexican wolves may have competitive interactions with other predators and mesopredators that compete with the Mexican wolf for food such as mountain lions, bears, coyotes, bobcats, and foxes. It also notes that scavenger species such as ravens, eagles, coyotes, and bears may be indirectly affected by Mexican wolves through wolf-killed carcasses resulting from predation.

Impacts from the Proposed Action

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

Cumulative Impact

When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably foreseeable future actions, direct and indirect impacts on ecosystem dynamics may be beneficial. The presence of wolves in Colorado could restore a more natural ecosystem structure by controlling prey populations, regulating

predation by coyotes and other mesopredators, and influencing vegetation community structure and succession. However, there is a great deal of uncertainty surrounding the potential effects of wolf reintroduction on ecosystem dynamics throughout Colorado.

Tribal Cultural Resources

Spatial and Temporal Boundaries

The spatial boundary for cumulative impacts to Tribal cultural resources includes the state of Colorado. The temporal boundary extends from when wolves were extirpated in Colorado through the life of the proposed action.

Impacts from the State Plan

Colorado Revised Statute 33-2-105.8 directs the CPW Commission to develop a plan to introduce gray wolves in Colorado, during which CPW would continue to work with Tribes in the development of the plan. Section 3.4.4, discusses the Tribes' concerns regarding the State's reintroduction efforts. The impacts associated with the State Plan are similar to those noted in section 4.6.1 for the no-action alternative. As shown in this section, impacts could occur to natural resources of cultural importance to Tribes. Due to the limited management options, specific management goals would need to be addressed for these resources in the final plan to reduce potential impacts. In addition, impacts are anticipated on hunting resources and livestock. As shown in section 4.6.1 and in the discussion of biological resources, hunting-related benefits are not anticipated to decline across the state, although impacts may be experienced at a local level, where wolves may contribute to declines in big game herds. No take provisions would be included, lethal or nonlethal, in the initial phases of reintroduction to address wolves if they reduce the population of big game ungulates below Tribal management objectives with implementation of the State Plan. The State may authorize take of wolves under phase 3 of the State Plan, under which the State would manage gray wolves as a nongame species to mitigate impacts to populations of ungulates (CPW 2022a). This assumes that the species would be federally delisted.

As noted in section 4.7.1, in the short term, wolf depredation on domestic livestock would likely be minimal, but after wolf recovery levels are approached, depredations are anticipated to increase. As part of its Gray Wolf Management Plan, CPW outlined a compensation program to alleviate some financial burden incurred by producers due to wolf-livestock conflicts.

Impacts from Mexican Wolf

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

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

Impacts from the Proposed Action

Under the proposed action, which includes the use of a section 10(j) rule, the reintroduction of wolves could 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. As shown in the discussion of biological resources, elk and deer populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. With the provision to allow take of wolves to address potential impacts to ungulates on Tribal reservation lands, the proposed action would provide the Service and its designated agents flexibility in managing wolves to limit elk and deer population decline or to facilitate recovery; the same could occur for pronghorn, wild sheep, and moose.

Potential impacts associated with wolf depredation on domestic livestock also could occur under the proposed action. However, the Service and its designated agents would have management options to address or assist in the reduction of these impacts.

Cumulative Impact

When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably foreseeable future actions, impacts on Tribal cultural resources as they relate to hunting and to livestock are anticipated. Cumulative impacts would generally be associated with the placement of wolves within the landscape, as well as for those already living in and naturally dispersing to Colorado, and their potential interactions with animals hunted by Tribal members and livestock. The proposed action would make up a small portion of the impact because it would provide benefits that would address adverse cumulative impacts to livestock and may provide benefits that address adverse impacts to ungulate populations on Tribal reservation lands.

With implementation of the proposed action, reintroduced wolves would be managed to reduce adverse effects to livestock as described in sections 4.5, 4.7, and 4.8 of this EIS. As noted in the discussion of biological resources, above, wolves could cause wild ungulate populations to decline. The final rule would allow take of wolves to address potential impacts to ungulate populations only on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands in Colorado. With implementation of this provision, if ungulate populations declined below established management goals, the Service and its designated agents within the Tribes would have the flexibility to manage wolves using nonlethal and/or lethal take for the conservation of wild ungulates on Tribal reservation lands in Colorado. Similar management options are available for the Mexican wolf through the implementation of the Mexican wolf 10(j) rule, some of which address migrating wolves and relocation. In this manner, cumulative impacts to hunting resources (e.g., ungulates) would occur, and the management actions associated with the proposed action would contribute to these cumulative impacts because the take provision related to ungulates would be limited and would not apply statewide.

As shown below for socioeconomic and environmental justice, the long-term, beneficial impacts from increased management flexibility under the proposed action and compensation programs implemented as part of the State Plan would reduce the potential for substantial economic costs to livestock producers, which would include Tribal members. Implementation of the management tools available under the proposed action (e.g., lethal or nonlethal take) would reduce the potential for cumulative impacts to occur to livestock producers.

Socioeconomics

Spatial and Temporal Boundaries

The spatial boundary for cumulative impacts on socioeconomic resources includes Colorado and neighboring states. The temporal boundary extends from when wolves were extirpated in Colorado through the life of the proposed action.

Impacts from the State Plan

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

Impacts from Mexican Wolf Reintroduction

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

Impacts from the Proposed Action

The proposed action would have long-term, beneficial impacts on livestock producers because the allowable lethal and nonlethal take would provide management flexibility and help mitigate economic losses to this group. Livestock producers would be able to address repeated depredation through lethal and nonlethal measures to reduce the financial impact. Although the 10(j) rule would mitigate impacts, livestock producers may still experience some adverse impacts related to depredation of livestock.

Under alternatives 1 and 2, the final rule would allow take of wolves to mitigate potential impacts to ungulate populations on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands. The Service and its designated agents would be able to manage reintroduced wolves using nonlethal and/or lethal take for the purposes of managing big game ungulate species consistent with established Tribal management objectives on reservation lands, if the respective Tribe has determined that wolf interactions are a driver of population declines.

Cumulative Impact

When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably foreseeable future actions, direct and indirect effects on socioeconomics could result in long-term, adverse impacts to outfitters and livestock producers as a result of the effects that reintroduction of wolves could have on big game ungulate species and depredation of domestic livestock. The Service and its designated agents would be able to use nonlethal and/or lethal take to address depredation of livestock. The long-term, beneficial impacts from increased management flexibility under the proposed action and compensation programs implemented as part of the State Plan would reduce the potential for substantial economic costs to livestock producers. However, some financial losses would likely still occur because compensation programs may only partially cover the direct and indirect financial loss suffered by livestock producers from wolf depredation of their livestock.

The final rule as written would allow take of wolves to address potential impacts on ungulate populations on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands, which may partially mitigate potential adverse effects to outfitters and guides. Implementation of this provision would allow take of wolves by designated agents on Tribal reservation lands in Colorado if wolves were determined to be a major cause of ungulate populations not meeting established Tribal population goals or objectives. Based on the above, the proposed action would partially mitigate potential adverse effects from implementation of the State Plan and would not contribute to adverse cumulative effects on hunters, guides, and outfitters.

Reintroduced Mexican wolves are unlikely to become established in Colorado; therefore, Mexican wolves are unlikely to have cumulative impacts on hunters, guides, outfitters, and livestock producers in Colorado. According to the Service, any Mexican wolves that disperse outside the MWEPA in New Mexico and Arizona would be removed or relocated back within the boundary (USFWS 2022h).

The dispersal of wolves from Colorado into neighboring states carries potential socioeconomic impacts that could affect various stakeholders and businesses. One particular area of concern is the predation on livestock, which could result in economic losses and increased costs for livestock producers.

The potential for predation poses a challenge for agricultural communities. As wolves venture into agricultural areas, there is an increased risk of conflicts between them and livestock. Such conflicts can lead to financial losses for livestock producers. Instances of wolf predation can result in the death or injury of livestock, which can affect the profitability of farming and ranching operations. In response, livestock producers may have to incur additional expenses for preventive measures like reinforced fencing, guard animals, or increased surveillance, further straining their resources.

The impact of livestock predation extends beyond the agricultural sector to the broader local economies. Reduced profitability and higher costs for livestock producers may result in increased prices for consumers. This economic strain can compromise the viability of rural communities that rely on livestock production, potentially leading to job losses and negatively affecting local businesses that depend on the agricultural industry. Moreover, livestock producers in areas prone to wolf predation may face rising insurance premiums, increasing their financial burdens.

Environmental Justice

Spatial and Temporal Boundaries

The spatial boundary for cumulative impacts on environmental justice communities includes Colorado and neighboring states. The temporal boundary extends from when wolves were extirpated in Colorado through the life of the proposed action.

Impacts from the State Plan

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

Similarly, impacts to livestock producers, including Tribal producers, from wolf depredation of livestock would be unevenly distributed and localized. Individual producers may experience economic costs greater than the average for the industry across Colorado. For low-income and minority livestock producers these costs, as well as indirect economic costs, could be substantial under the no-action alternative. Therefore, implementation of the

State Plan could result in disproportionately high and adverse impacts to low-income and minority livestock producers, particularly in the focal counties.

As part of the State Plan, Colorado has developed policies to compensate livestock producers whose livestock have been depredated by reintroduced gray wolves. Compensation by the State would mitigate potential economic effects to minority or low-income livestock producers. Depending on the level of compensation provided by the State, these economic effects may not be fully mitigated.

Impacts from Mexican Wolf

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

Impacts from the Proposed Action

The final rule would include the provision allowing take of wolves to mitigate potential impacts to ungulate populations on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands, which could have a long-term, beneficial impact on big game species because the Service and the Tribes would be able to manage reintroduced wolves using nonlethal and/or lethal take to mitigate population declines below Tribal management objectives. The proposed action could result in disproportionately high and adverse impacts to people who rely on hunting for subsistence outside reservation lands, including members of Native American Tribes who hunt in the Brunot Area.

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

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

Cumulative Impact

The proposed action would partially mitigate the adverse effects of implementation of the State Plan on low-income and minority environmental justice population groups of concern. Reintroduced wolves on Southern Ute Indian Tribe and Ute Mountain Ute Tribe reservation lands could be managed to reduce adverse effects to big game ungulate species, which could mitigate the potential adverse effects of wolf reintroduction on ungulate populations on these reservation lands. Reintroduced wolves would be managed to reduce adverse effects on

livestock as described in section 4.8 of this EIS. The proposed action would not result in cumulatively greater adverse effects to minority or low-income population groups of concern in combination with the State Plan.

Additionally, as part of the State Plan, Colorado has developed policies for compensation to livestock producers whose livestock have been depredated by reintroduced gray wolves. Along with the management flexibility that would be provided under the section 10(j) rule, compensation would mitigate potential economic effects to minority or low-income livestock producers. Depending on the level of compensation provided by the State, these economic effects may not be fully mitigated.

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

Wolves that disperse outside Colorado would be managed under the federal or state regulations that apply in the area where they are found (for example, wolves would be managed as endangered in most of Utah and as a federally delisted species in Wyoming) or may be relocated back to Colorado as discussed previously in this section. Reintroduction of gray wolves by the State of Colorado could impact minority and low-income population groups of concern in neighboring states, and these impacts could be similar to the impacts described in section 4.8 of this EIS. However, the proposed action would not contribute cumulatively to these impacts because the proposed action would not be implemented or have effects outside Colorado.

When the impacts of the proposed action are combined with the impacts of other past, present, and reasonably foreseeable future actions, direct and indirect impacts on minority and low-income population groups of concern in Colorado could be disproportionately high and adverse but would partially be mitigated. Increased management flexibility under the proposed action and compensation programs implemented as part of the State Plan would reduce the potential for substantial economic costs to low-income and minority population groups of concern in Colorado, including livestock producers. Inclusion of the provision to mitigate potential impacts to ungulate populations on the reservation lands of the Southern Ute Indian Tribe and Ute Mountain Ute Tribe in Colorado would reduce the potential for substantial economic costs to Tribal members who are employed as outfitters and guides on reservation lands and those Tribal members who rely on subsistence hunting.

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

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

These included plans or laws such as state statutes and regulations related to the release or management of predators, Natural Resource Conservation District long-range plans, and Soil and Water Conservation District resolutions related to the reintroduction of endangered predators. NEPA's intent and governing regulations direct

federal agencies to “cooperate, consult and coordinate” with the county or conservation district in the development of plans, decisions, activities or actions which may affect the county, the district or its residents, especially related to early and ongoing planning, coordination, and consultation with state and local governments and stakeholders (40 CFR 1501.8, 1501.9). During the development of this EIS, the Service worked with cooperating agencies to determine whether additional local plans or laws should be considered based on the scope of our proposed action and alternatives.

Additional relevant State plans or laws include:

- Colorado Code § 33-2-105.5 (2021)
- Colorado Code § 33-6-203 (2021)
- Colorado Code § 33-6-207 (2021)
- Colorado Wildlife Commission Regulation 2 CCR 406-17-XII-17122 (2020)

To the extent that any of these plans or laws establish a local (state or county) process to request management action by the Service or a designated agency to address wolf-human conflicts and that this process is consistent with, or not in conflict with (e.g., placing restrictions on or asserting local government authority over federal law) our proposed action, we do not find any inconsistency between the plans or laws and our actions taken in accordance with the ESA and state or local actions. Similarly, to the extent that any of these plans or laws request action from the State of Colorado or Colorado Congressional delegation that is not in conflict with our proposed action, we do not find any inconsistency. To the extent that any of the documents above establish or include reference to policies or ordinances prohibiting the import or release of certain wildlife, specifically gray wolves, the provisions of the section 10(j) rule would provide management flexibility for designated agents to address conflicts between gray wolves and existing land uses and economic activities. The Service recognizes that options to reduce or resolve conflict in specific instances may be available to the Service and the State of Colorado by working with local governments to address safety concerns, select release sites, and provide information to local communities. The Service also recognizes the interest held by local governments and communities, including livestock permittees and private landowners, in the management of gray wolves in Colorado west of the Continental Divide. To that end, collaboration with local entities as well as communication with local communities would be incorporated in the development of this 10(j) rule.

The proposed federal regulatory frameworks under alternatives 1 and 2 may allow activities that are inconsistent with local plans or laws. These activities could include discharge of firearms outside allowed hunting activities and operation of noise-emitting equipment during hazing (non-injurious, nonlethal take) of wolves, which could occur at night. These activities may be inconsistent with local noise regulations. Regardless of the alternative selected, the proposed action would be consistent with local public safety regulations. Take of wolves to protect human life and safety would be permitted under all alternatives, as noted in table 2-4.

Through the public scoping and review of the draft EIS, other state and local entities noted the presence of comprehensive, land use, and wildlife management plans, including the State of Utah, the State of New Mexico, the State of Arizona, Garfield County, Mesa County, and Moffatt County, and requested that the Service consider conflicts with these plans. These entities are cooperating agencies in the EIS process, and consistency with these planning documents was considered throughout the planning process.

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

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

No-Action Alternative

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

Alternatives 1 and 2

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

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

The proposed action would provide a regulatory framework for the State-led reintroduction of the gray wolf to provide management flexibility and provide for conservation of the species. The EIS analyzes the impacts of the proposed take provisions. Although these alternatives may lead to different impacts across resource areas, the relationship between short-term uses and long-term productivity would not be appreciably different from one alternative to another. The potential for take provisions under either alternative would not alter the characteristic uses of the land or resources in the project area. Short-term economic impacts may be sustained by individual ranchers/livestock producers, but with the mitigations offered by the proposed regulatory framework, long-term effects on overall livestock production in the study area are not expected. There could be localized, short-term impacts to ungulates or the related economy of big game hunting from the action alternatives. In conclusion, implementation of the action alternatives is not expected to permanently narrow the range of beneficial uses of the human environment or adversely affect the long-term productivity of the project area.

4.9.5 Irreversible and Irretrievable Commitment of Resources

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

related to permit issuance and/or annual review of memoranda of agreement if those tools are used. Under all alternatives, the provision of a regulatory framework to provide management flexibility to the Service and its designated agents would not affect climate change.

No-Action Alternative

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

Alternatives 1 and 2

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

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

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 C 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 20 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, September 28, 2022, October 5, 2022, October 26, 2022, December 16, 2022, January 12, 2023, February 22, 2023, and July 17 and 27, 2023.
 - 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 met with the Ute Mountain Ute via teleconference on January 24, 2023, for an initial conversation regarding the consultation process. On January 13, 2023, via telephone, the Pawnee Nation representative noted that they would like to be kept informed of the process but did not require a meeting at this time. During review of the draft EIS, the Navajo Nation requested to be involved in government-to-government consultation with the Service, which is ongoing. Likewise, the Southern Ute Indian Tribe requested to be involved in government-to-government consultation with the Service, which is ongoing. [Preparer's note: This section will be updated as information is provided and additional meetings are scheduled.]
 - In addition to government-to-government consultation, the Service has been actively engaged with informal coordination with Tribal members including the Southern Ute Indian Tribe and Navajo Nation.
 - 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 and continued to coordinate with the State into 2023 to ensure consistency with the State Plan. The Service and CPW hold biweekly coordination meetings which are expected to continue at least until the end of calendar year 2023.

- In April 2023, the Service and neighboring states (Utah, Arizona, and New Mexico) began meeting weekly to coordinate on how potential conflicts with gray wolves released in Colorado would be addressed. These discussions included developing a Memorandum of Understanding for how conflicts between gray wolves and Mexican wolves would be addressed and a general permitting approach to address potential conflicts. These weekly meetings occurred between April 2023 and July 2023 **[Update with each draft]**.
- **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.**
 - **Public Scoping:** 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.
 - **Review of the Draft EIS:** The proposed rule and draft EIS were made available to the public for a 60-day review period from February 17, to April 18, 2023. During this time, three in-person public meetings were held on the Western Slope of Colorado (March 14-16, 2023), one meeting was held in Lakewood, Colorado (March 28, 2023), and a virtual meeting was held on March 22, 2023. The responses to public comments on the proposed rule and EIS are provided in Appendix D.

5.3 LIST OF RECIPIENTS OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT

Upon publication of the notice of availability of the final EIS in the *Federal Register*, a news release will be provided to the media outlets who received the news release announcing the Notice of Intent in July of 2022 and the draft EIS in February 2023. Notice will be provided to media, interested individuals, and organizations via the Service's standard mailing/distribution lists, as well as the following:

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

CHAPTER 6 SUMMARY OF IMPACTS

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

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

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 regulated take would be limited to instances where wolves pose a threat to human life or safety. 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.	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 (Including Other Federally Listed and State-listed Species)	There would be no flexibility for the management of reintroduced wolves for the purposes of conserving other species of special concern, potentially resulting in short- or long-term, adverse effects on prey species. 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. Like under the no-action alternative, alternative 1 is not likely to result in adverse effects on species of special concern.	Potential environmental impacts would be the same as under alternative 1.
Biological Resources – Other Wildlife (Elk, Deer, and Other Ungulates)	There would be no flexibility for the management of reintroduced wolves for the purposes of managing other wildlife populations for conservation, potentially resulting in short- or long-term, adverse impacts to prey populations.	Potential impacts to prey populations would be similar to those described under the no-action alternative because management flexibility for reintroduced wolves for the purposes of managing ungulate populations would be limited to reservation lands for the Ute Mountain Ute and Southern Ute Indian Tribes within Colorado. Because these lands make up a relatively small portion of the state's geographic area, potential take of wolves for the management of ungulates on reservations lands is not likely to result in measurable effects on statewide elk and deer populations.	Potential impacts to prey populations would be the same as under alternative 1.

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
Cultural Resources – Tribal Cultural Resources	<p>Under this alternative, damage to archaeological and historical resources may occur in locations where the presence of wolves coincides with that of these resources. For instance, denning activities may damage surface or subsurface resources if these locations are used by wolves, and the presence of wolves may inhibit the potential for Tribal access to these resources.</p> <p>The reintroduction of wolves could also affect natural resources (e.g., wildlife) of importance to Tribes in part due to competition resulting in changes to predation habits or habitat selection.</p> <p>The reintroduction of wolves could affect wildlife species that are hunted or used by the Tribes, such as elk, deer, and other ungulates. Elk, deer, and other ungulate populations could decline in response to unmanaged predation and other pressures as a result of wolf reintroduction. These animals could be impacted over the long term.</p>	<p>Potential impacts to Tribal cultural resources would be similar to those described for the no-action alternative, although for some resources, including livestock, potential impacts could be reduced due to the management flexibility available under the 10(j) rule. Under alternative 1, the Southern Ute Indian Tribe and Ute Mountain Ute Tribe would have the ability to take wolves if populations of big game ungulates decline below established Tribal management goals as a result of wolf reintroduction. Therefore, alternative 1 could have a beneficial impact on ungulate populations on reservation lands over the long term, compared to the no-action alternative.</p>	<p>Potential impacts to Tribal cultural resources would be similar to those described for alternative 1 due to the management flexibility that would be provided by the section 10(j) rule. If an existing population were identified within a reservation, lethal take of wolves would be prohibited within the section 10(a)(1)(A) permit boundary. Alternative 2 would still provide the designated agents, including Tribes, flexibility to manage an existing population of gray wolves to mitigate impacts to livestock. The Southern Ute Indian Tribe and Ute Mountain Ute Tribe also would have the management flexibility to address decreases in ungulate populations below Tribal goals on reservation lands within the experimental population boundary, which could reduce impacts to wildlife species that are hunted by the Tribes.</p>

Environmental Resource	Alternatives		
	No-Action Alternative	Alternative 1 (Preferred Alternative)	Alternative 2
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 or Tribal management objectives 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.</p> <p>An estimated 103–916 cattle and 35–395 sheep statewide and 29–256 cattle and 15–164 sheep in the 21 focal counties would be killed or injured assuming a population of 200 wolves. This would result in an estimated inflation-adjusted loss of up to \$1,607,573.59 in the statewide study area and up to \$365,013.13 in the 21 focal counties annually under the no-action alternative, which represents 0.0315 percent (Colorado) and 0.0071 percent (21 focal counties) of the total market value of cattle and sheep in Colorado.</p>	<p>Under alternative 1, the Service and its designated agents 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. Impacts to outdoor recreation outfitters would be similar to those under the no-action alternative under the proposed rule as written. Because there would be no statewide provision to address the management of wolves to address ungulate impacts on Colorado recreation outfitters, impacts would be the same as under the no-action alternative—long term, localized, and adverse. Implementation of the ungulate provision on Southern Ute and Ute Mountain Ute reservation lands could mitigate adverse economic effects to Tribes and outfitters by maintaining ungulate populations at a higher level than under the no-action alternative.</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 areas without gray wolves. Alternative 2 would allow for lethal and/or nonlethal take under the provisions of the section 10(j) rule in most areas of the state, except for Jackson County and western Larimer County, which would be subject to a section 10(a)(1)(A) permit (see table ES-1). 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
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>Disproportionately high and adverse impacts could occur on low-income outfitters and guides, subsistence hunters, and Tribes in local areas across most of the state based on the factors discussed under the no-action alternative. Implementation of the ungulate provision on Southern Ute and Ute Mountain Ute reservation lands could have a long-term, beneficial impact on big game ungulate species by mitigating the potential for ungulate populations to decline below Tribal management objectives. 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. However, 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.</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 Service and its designated agents flexibility to manage an existing population of gray wolves to address livestock depredation. 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. Impacts to outfitters and guides and subsistence hunters would be similar to impacts described under alternative 1.</p>

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