

From: [Zerrenner, Adam](#)
To: [Fox, Lori](#); [Niva, Liisa M](#)
Cc: [Forbes-Guerrero, Jessica](#); [Becker, Scott A](#); [Broderdorp, Kurt](#)
Subject: Re: [EXTERNAL] Mexican Wolf Section to Brady
Date: Monday, July 24, 2023 7:52:03 AM
Attachments: [image001.png](#)
[CO Wolves Mexican Wolf Excerpts .docx](#)

Thank you Lori!

From: Fox, Lori <lori.fox@wsp.com>
Sent: Monday, July 24, 2023 8:48 AM
To: Zerrenner, Adam <Adam_Zerrenner@fws.gov>; Niva, Liisa M <Liisa_Niva@fws.gov>
Cc: Forbes-Guerrero, Jessica <Jessica.Forbes-Guerrero@wsp.com>
Subject: RE: [EXTERNAL] Mexican Wolf Section to Brady

Here you go!

Basically I cut out one of the alts considered but not carried forward because it was about Mexican Wolf management. Then the entire cumulative impact section as it is hard to just pull out the Mexican wolf stuff as it is all intertwined.

Let us know what else you need.

Thanks,
Lori



Lori Fox, AICP
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From: Zerrenner, Adam <Adam_Zerrenner@fws.gov>
Sent: Monday, July 24, 2023 7:13 AM
To: Fox, Lori <lori.fox@wsp.com>; Niva, Liisa M <Liisa_Niva@fws.gov>
Cc: Forbes, Jessica <Jessica.Forbes@wsp.com>
Subject: Re: [EXTERNAL] Mexican Wolf Section to Brady

Good Morning Lori,

Liisa will send it to Brady today since he has been on annual leave. His review will correspond with the review timeline of the cross regional review.

Are you all able to send us the MX wolf section(s) from the FEIS so that Liisa can send to

Brady?

Thank you and hope you had a good weekend,

Adam

From: Fox, Lori <lori.fox@wsp.com>
Sent: Sunday, July 23, 2023 5:00 PM
To: Zerrenner, Adam <Adam_Zerrenner@fws.gov>
Cc: Forbes-Guerrero, Jessica <Jessica.Forbes-Guerrero@wsp.com>
Subject: [EXTERNAL] Mexican Wolf Section to Brady

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Hi Adam,

I see we need to send Brady the Mexican wolf section tomorrow. Did we assign that task to USFWS or WSP? If you need us to send it, let us know what a review timeframe would be. I would say to be most helpful, probably by COB 7/28 so we still have the following week to incorporate before the next draft.

Thanks,
Lori



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

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.

Past, Present, and Reasonably Foreseeable Future Actions

The State of Colorado Gray Wolf Reintroduction

Proposition 114, now Colorado Revised Statute 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).

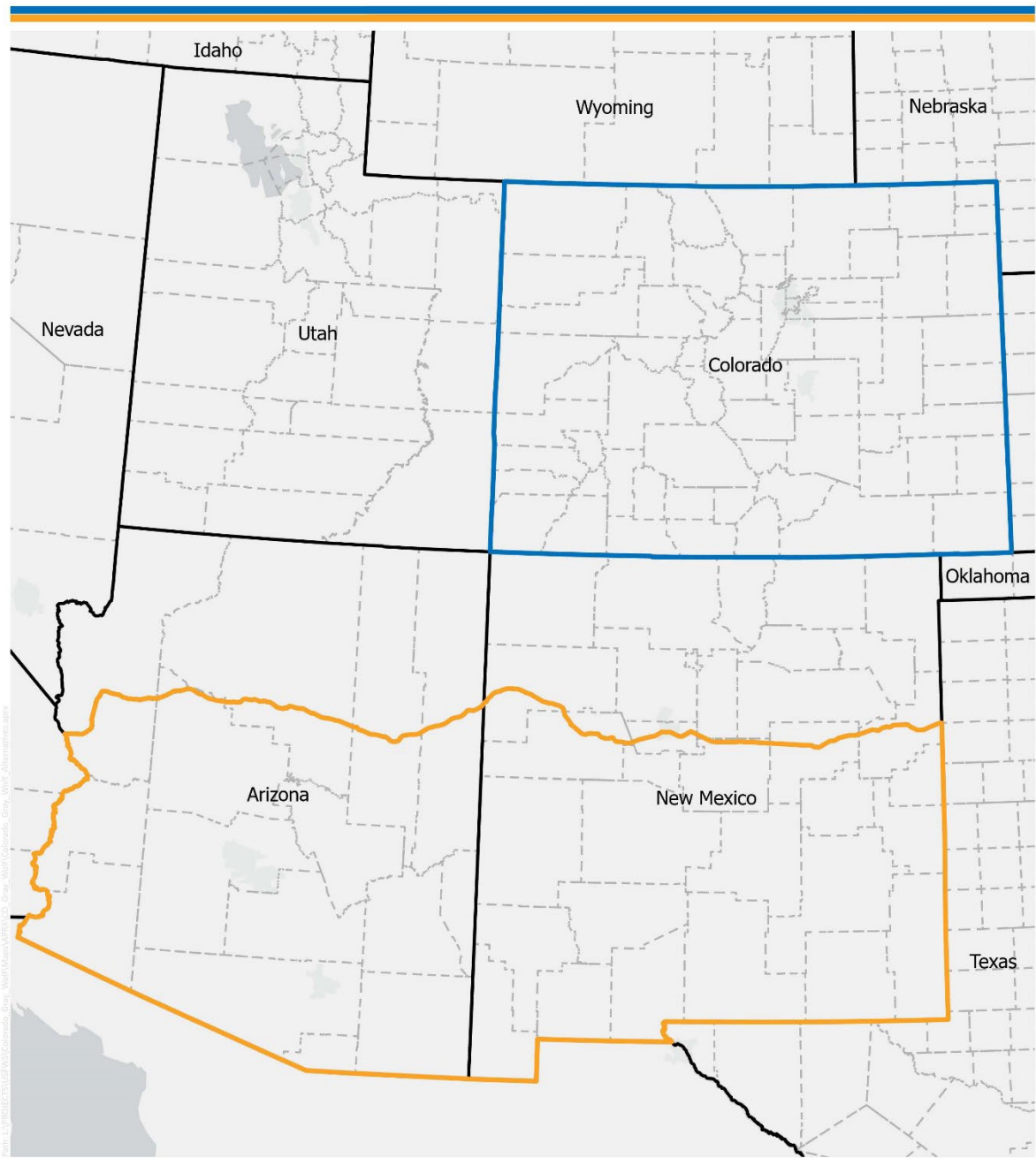


Photo: U.S. Fish & Wildlife Service. Gray Wolf Experimental Population Boundary. Gray Wolf Experimental Population Area.



Figure 4-1
 Gray Wolf Experimental Population
 Boundary and Mexican Wolf
 Experimental Population Area
 CO, NM, AZ

 Colorado Gray Wolf 10(j) Rulemaking EIS

1.1.2 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 Duyne et al. 2009; Dorj and Namkhair 2013; López-Bao et al. 2013). However, wolves tend to target wild horses when prey resources (e.g., smaller ungulates) are depleted (Van Duyne 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 Statue 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 socioeconomics 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.