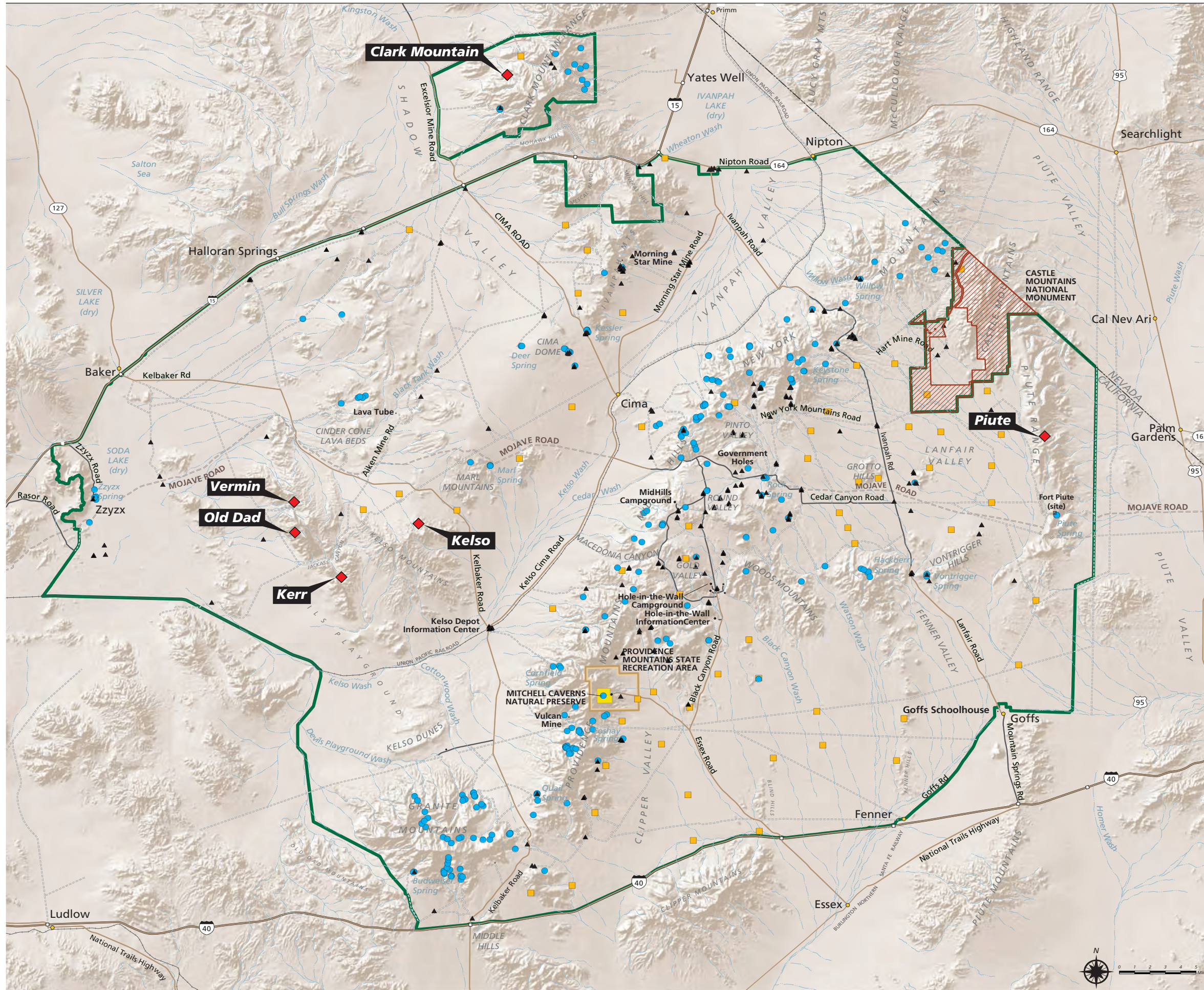


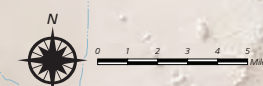
Wilderness



Mojave National Preserve
Water Resources Management Plan and Environmental Assessment



- Mojave National Preserve boundary
- National Park Service wilderness
- Spring
- Small game guzzler
- Big game guzzler
- Well
- Paved road
- Unpaved 2-wheel drive road
- Unpaved 4-wheel drive road
- Mojave Road 4-wheel drive road
- Desert wash



For the purposes of this plan, the four qualities of wilderness in the Preserve, and the relationship of those qualities to water resources, are understood to be as follows:

- *Untrammelled* – The Mojave Wilderness is largely free of active human manipulation. However, the use of water developments, ranging from developed springs to wildlife guzzlers, negatively affects the untrammelled quality of wilderness. The presence of historic water development structures that are merely a relic from historical land management, are not actively managed for conservation purposes, and are part of the landscape is not considered an adverse impact on untrammelled qualities.
- *Natural* – The Mojave Wilderness supports a diverse array of native plant and animal species that survive in the desert environment. Part of that natural ecosystem includes desert bighorn sheep and other wide-ranging species that have been negatively affected by modern development both in the Preserve and in the surrounding ecosystem. Wildlife management and conservation activities, including the installation and management of guzzlers or other water developments, are considered an important tool to maintain the natural wildlife qualities of the wilderness (at times at the expense of other qualities).
- *Undeveloped* – Most of the Mojave Wilderness is free of modern land disturbance, structures, or vehicle access that would indicate human improvements or habitation. There are, however, a myriad of abandoned mining and ranching structures located within the wilderness that adversely impact the wilderness character and undeveloped qualities. The presence of guzzlers and other water developments and the use of motorized equipment to access and maintain those developments further adversely impact the undeveloped wilderness quality in the vicinity of those sites.
- *Opportunity for Solitude or Primitive and Unconfined Recreation* – The Mojave Wilderness provides ample opportunities for solitude and primitive recreation. Water features in the wilderness do not affect this quality, nor does the highly infrequent access to water features for the purposes of monitoring or maintenance.

Wilderness Management

Section 4(c) of the Wilderness Act states:

Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

This minimum requirement concept is intended to minimize impacts on wilderness values and resources. Managers may authorize (using a documented process) the generally prohibited activities or uses listed in Section 4(c) of the Wilderness Act if deemed necessary to meet the minimum requirements for the administration of the area as wilderness.

Regarding natural resources management principles, NPS policies direct that the principle of nondegradation be used, and that natural processes be allowed to shape and control wilderness ecosystems. Management intervention in wilderness should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating

outside of wilderness boundaries. Regarding cultural resources, NPS policies direct that cultural resources that have been included in wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources, using management methods that are consistent with the preservation of wilderness character and values (NPS 2006). These wilderness management principles are important to consider in relation to water resources management in the Mojave Wilderness since many of the existing water developments in wilderness are historic, while others are important for native wildlife conservation.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Introduction

The National Environmental Policy Act (NEPA) requires that environmental documents describe the environmental impacts of a proposed federal action, reasonable alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. This chapter analyzes both beneficial and adverse impacts that would result from implementing any of the alternatives described in this plan. The No Action Alternative (Alternative 1) is used to compare the effects of current actions and management direction at the Preserve with those proposed in the action alternatives (Alternatives 2, 3, and 4). The resource topics presented in this chapter, and the organization of the topics, correspond to the resource discussions contained in *Chapter 3: Affected Environment*.

This chapter begins with a brief explanation of the resource topics analyzed, followed by a discussion on methods and assumptions for assessing impacts, and finally a description of the projects that make up the cumulative impact scenario. The impacts of each alternative are then analyzed by impact topic. Each impact topic includes a description of the impact of the alternative, a conclusion for each alternative, and a discussion of cumulative effects. The impacts of all alternatives are summarized in Table 22 at the end of the chapter.

Resource Topics Analyzed

The specific resource impact topics to be analyzed were determined during the internal and public scoping process and are based on the dynamics of water resources in the Preserve (this process is described in the “Scoping and Public Participation” section in *Chapter 2: Alternatives*). Resource topics analyzed include the following:

- *Wildlife – Desert Bighorn Sheep* – including the availability of dry season habitat with adequate water to sustain populations
- *Wildlife – General* – including general wildlife species, key water resource–reliant species, unique or important wildlife or wildlife habitat, nonnative and subsidized wildlife species, and threatened, endangered, or sensitive species
- *Cultural Resources* – including historic or archeological resources associated with water sources
- *Wilderness Character* – including the characteristics and qualities of designated wilderness areas

Resources that were not analyzed in depth or were dismissed from further consideration and the rationale for that dismissal are briefly described in *Chapter 1: Purpose of and Need for Action*.

Methods and Assumptions for Assessing Impacts of Alternatives

General Analysis Methods

The analysis of impacts on resources follows CEQ guidelines and DO-12 (NPS 2015). The impact analysis and conclusions are based on quantitative and qualitative assessment of changes to affected resources. The analysis is informed by the best available applicable scientific literature and studies, information and professional judgement provided by experts within the Preserve and NPS and other agency personnel, and public input.

In accordance with CEQ regulations, direct, indirect, and cumulative impacts are described (40 CFR 1502.8 and 1502.16), and the significance of the impact on a resource topic is assessed in terms of context and intensity (40 CFR 1508.27). Where appropriate, measures to mitigate potential adverse impacts are described and are incorporated into the evaluation and description of impacts. More specific methods and assumptions used to assess impacts are described under each resource topic.

Assessing Impacts Using CEQ Criteria

The impacts of the alternatives are assessed using the CEQ definition of “significantly” (1508.27), which requires consideration of both context and intensity:

- *Context* – The significance of an action must be analyzed at multiple scales, such as the specific site, the particular locale, the affected region, and the larger global affected interests. Context can be environmental or social, and may vary based on the resource being analyzed. It includes both resource-specific context and overall context.
- *Intensity* – This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about aspects of a major action. For each resource topic analyzed, the potential significance of the impacts is assessed in the conclusion section that follows the discussion of the impacts for each alternative.

Overall Context

Resource-specific context is presented under each resource topic and applies across all alternatives. The context for impacts may include any of the following scales:

- Site-specific (site of proposed action)
- Local (within the Preserve boundary)
- Regional (within the Mojave Desert, or within about 50 miles of the Preserve boundary)
- Global affected interests (beyond the Mojave Desert region)

Duration and Impact Types

Duration refers to the period over which the effects of an impact persist. Duration of impacts is defined as follows:

- *Short-term* – Impacts last less than two years, often quite less. This would include any temporary impacts, such as construction associated with the alternatives.
- *Long-term* – Impacts last for more than two years, which would include impacts that are permanent. This plan is established to serve the Preserve for the next 15 to 20 years. Therefore, the analysis period used for assessing impacts is up to 20 years.

Impact Type refers to the nature of the impacts of the proposed management actions when compared with the existing conditions (beneficial or adverse), and the relationship between the time and location of the management action and when and where impacts are experienced on resources (direct or indirect) (40 CFR 1508.8). The following definitions of impact types are used for all resource topics:

- *Beneficial* – Impacts that move the resource toward a desired condition or result in a positive change when compared to the existing conditions.
- *Adverse* – Impacts that move the resource away from a desired condition or detract from its appearance and condition when compared to the existing conditions.

- *Direct* – Effects or impacts caused by an action that would occur at the same time and place as the action.
- *Indirect* – Effects or impacts caused by the action that would be reasonably foreseeable but would occur later in time, at another place, or to another resource.

Cumulative Impacts

The CEQ regulations that implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts are considered for all alternatives, including the No Action Alternative. Table 17 summarizes the actions that could affect the various resources being analyzed. Projects included in the cumulative impact analysis do not affect all resources equally.

Cumulative impacts were determined by combining the impacts of the alternative being considered with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects and plans in the Preserve and, if applicable, the surrounding region. These reasonably foreseeable future actions and projects are described in greater detail in the “Regional Context” section of *Chapter 3: Affected Environment*.

For most of the impact topics, the geographic area defined for the analysis was Mojave National Preserve. In some cases, the area of consideration was the greater Mojave Desert region.

Table 17. Cumulative Impact Scenario

Activity	General Wildlife	Desert Bighorn Sheep	Cultural Resources	Wilderness Character
Past and Present Impacts				
<u>Existing Infrastructure:</u> <ul style="list-style-type: none"> • I-15 and I-40, which border the Preserve to the north and south • UPRR, which crosses through the Preserve • Numerous highways and roads • Transmission lines • Canals and aqueducts • Small towns, settlements, ranches, and population centers 	Habitat fragmentation, habitat loss, mortality, reduced reproductive success	Habitat fragmentation, habitat loss, mortality, reduced reproductive success	Loss of local cultural resources at disturbed sites	Impacts on Preserve viewshed and noise levels
<u>Land Management Plans and Actions:</u> <ul style="list-style-type: none"> • Mojave Trails National Monument • Sand to Snow National Monument • Castle Mountain National Monument 	Habitat connectivity and conservation	Habitat connectivity and conservation	Conservation of eligible cultural resources in the Mojave Desert region	Designation of wilderness and protected areas within the Mojave Desert region
<u>Preserve Projects and Plans:</u> <ul style="list-style-type: none"> • West Pond EA • Translocation of Bighorn Sheep to Eagle Crag Mountains FONSI • Abandoned Mine Safety Installations FONSI • Barber Peak Trail Loop Reroute FONSI • Ivanpah Desert Tortoise Research Facility 	Habitat connectivity and conservation	Habitat connectivity and conservation	Conservation of eligible cultural resources in the Mojave Desert region	Restoration of native species habitat and populations (Mohave tui chub and Mojave Desert tortoise)
<u>Land Management Plans and Actions:</u> <ul style="list-style-type: none"> • Western Solar Plan • Desert Renewable Energy Conservation Plan • West Mojave Plan 	Habitat fragmentation and connectivity	Habitat fragmentation and connectivity	Loss of local cultural resources at disturbance sites	Impacts on Preserve viewshed and noise levels
<u>Solar Energy Development:</u> <ul style="list-style-type: none"> • Bright Source Energy Solar Development • Silver State South Solar Project • Stateline Solar Farm Project 	Habitat fragmentation, habitat loss, mortality, reduced reproductive success	Habitat fragmentation, habitat loss, mortality, reduced reproductive success	Loss of local cultural resources at disturbed sites	Impacts on Preserve viewshed and noise levels

Activity	General Wildlife	Desert Bighorn Sheep	Cultural Resources	Wilderness Character
<p><u>Military, Industrial, Agricultural, and Mining Projects:</u></p> <ul style="list-style-type: none"> • Castle Mountain Mine Water Extraction • Calnev Pipeline corrosion control prevention • Mountain Pass Rare Earth Mine (inactive since 2015) 	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Loss of local cultural resources at disturbed sites</p>	<p>Impacts on Preserve viewshed and noise levels</p>
<p>Reasonably Foreseeable Impacts</p>				
<p><u>Proposed Infrastructure:</u></p> <ul style="list-style-type: none"> • Ivanpah Regional Airport • California-Nevada Maglev (magnetic levitation) Rail • Xpress West high-speed rail • Proposed regional transmission lines 	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Loss of local cultural resources at disturbed sites</p>	<p>Impacts on Preserve viewshed and noise levels</p>
<p><u>Preserve Projects and Plans:</u></p> <ul style="list-style-type: none"> • Livestock Grazing Management Plan 	<p>Habitat connectivity and conservation</p>	<p>Habitat connectivity and conservation</p>	<p>Conservation of eligible cultural resources in the Mojave Desert region</p>	<p>Domestic livestock are not generally permitted in wilderness areas</p>
<p><u>Solar Energy Development:</u></p> <ul style="list-style-type: none"> • Soda Mountain Energy Development Project 	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Loss of local cultural resources at disturbed sites</p>	<p>Impacts on Preserve viewshed and noise levels</p>
<p><u>Military, Industrial, Agricultural, and Mining Projects:</u></p> <ul style="list-style-type: none"> • Fort Irwin National Training Center expansion • Twentynine Palms Marine Corps Air Ground Combat Center expansion • Cadiz Water Project 	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Habitat fragmentation, habitat loss, mortality, reduced reproductive success</p>	<p>Loss of local cultural resources at disturbed sites</p>	<p>Impacts on Preserve viewshed and noise levels</p>

Wildlife – Desert Bighorn Sheep

This analysis describes how the proposed plan alternatives could affect the quality of desert bighorn sheep habitat in the Preserve. As described in detail in *Chapter 3: Affected Environment*, desert bighorn sheep are a State of California fully protected species that use both natural and developed water sources (i.e., big game guzzlers) for survival.

Methods and Assumptions

General bighorn habitat in the Preserve is based on seven habitat patches outlined by Creech et al. (2014) (see Figure 2). The NPS created a model to better understand the relationship between landscape and environmental variables and big horn sheep use during the dry season (see *Chapter 3: Affected Environment* and Appendix B). The model indicates that dry season habitat can be understood as an area that provides suitable habitat for bighorn within 2.5 kilometers of a reliable water source (either a spring or guzzler) during the hot summer months of June, July, and August. This range was selected based on GPS collar data gathered from ewes in the Old Dad Mountain area (see Figure 18 and *Chapter 3: Affected Environment*, “Bighorn Habitat in the Preserve”), and on existing studies (Turner et al. 2004; Valdez and Krausman 1999). Ninety-three percent of the location data points for the collared ewes during dry season occurred within this radius (see Figure 18). Dry season habitat is important for bighorn sheep conservation because the availability of water during the summer months is critical for ewe and lamb survival.

The analysis quantifies and compares the dry season habitat value predicted for the separate guzzlers under each alternative. Habitat value indicates the contribution a guzzler makes to the overall quality of the Preserve’s dry season habitat based on a model to infer the habitat preferences of ewes during the dry season using radio collar data and environmental variables (see *Chapter 3: Affected Environment* and Hughson 2018—Appendix B). Proximity to water and relatively high elevations emerged as the two variables that best predicted ewes’ dry season habitat preferences, and were used to develop a habitat value index. The dry season habitat value predicted under each action alternative is expressed as a percentage of the existing conditions (No Action), which is equal to 100 percent (see Figure 21). The percent change to dry season habitat under each alternative compared to the existing conditions is summarized in Table 18 and Figure 21.

Table 18. Change to Habitat Value under Each Alternative

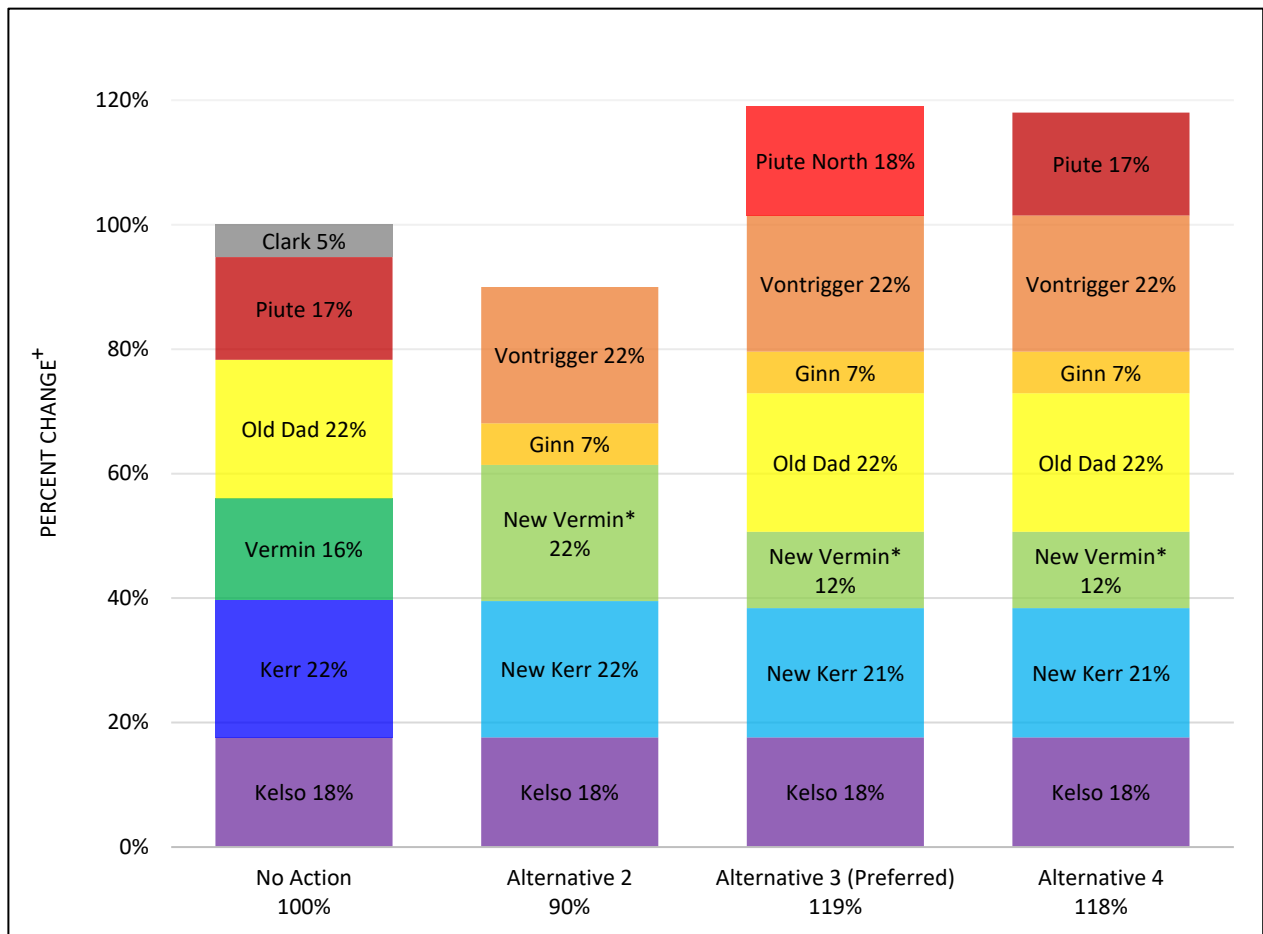
Alternative	Description of Big Game Guzzler Actions	% Change
No Action	Existing guzzler arrangement	no change
Alternative 2	3 removed, 2 relocated, 1 retained, 2 new	-10
Alternative 3 (Preferred Alternative)	2 removed, 2 relocated, 2 retained, 3 new	+19
Alternative 4	1 removed, 2 relocated, 3 retained, 2 new	+18

Context

At least six bighorn populations occur in the Preserve, each associated with rugged mountain ranges where suitable habitat exists (“habitat patches” per Creech et al. 2014; see Figure 2). While several of these habitat patches contain natural water sources, some populations use supplemental water provided by six big game guzzlers. The largest bighorn population in the Preserve—Old Dad/Kelso—uses guzzlers exclusively for water during the dry season, while the Clark Mountain guzzler is in a location that is not known to be used by sheep.

The benefits and effects of artificial water sources on bighorn populations is a debated topic. Several studies, including Longshore et al. (2009) and Bleich et al. (2010), describe the benefits of guzzlers to bighorn populations and their conservation and provide a basis for concerns about the consequences of reduced dry season habitat, such as reduced reproductive success, changes in movement and dispersal patterns, increased mortality, or increased predation. Others, including Cain (2006) and Cain et al. (2007), question the singular importance of developed water sources to bighorn population persistence, suggesting a greater importance of forage availability. This analysis adopts the cautious assumption that the availability of some type of water source during the dry season is a requisite characteristic for long-term habitat occupancy. This assumption is supported by the observations of Preserve staff and by some published literature (see citations in Hughson 2018—Appendix B). If dry season water is less important than assumed in this analysis, actual impacts of the action alternatives would be less than those predicted here.

Figure 21. Dry Season Habitat Value for Each Guzzler under No Action and Action Alternatives



[†]Percentages are based on the dry season habitat value index, which incorporates distance to water and elevation within 2.5 kilometers of a guzzler or water source (Hughson 2018—Appendix B). The dry season habitat value percentage for each action alternative is the sum of all guzzlers' contributions to habitat value. Action alternative percentages are in reference to existing conditions (No Action), which equals 100 percent.

*Alternative percentages for New Vermin differ due to retention of Old Dad and 2.5 km overlap with Vermin.

Looking more broadly at regional metapopulation implications, several studies, such as Bleich et al. (1996), Epps et al. (2006), Epps et al. (2007, 2010), and Creech et al. (2014), support the importance of regional bighorn connectivity and potential benefits of restoring migration corridors and unoccupied habitat patches. Longshore et al. (2009) and Bleich (2009) describe the importance of artificial water sources as mitigation for the loss of naturally occurring water sources and habitat that has resulted from development and climate change. For this analysis, it is assumed that habitat occupancy or connectivity could be encouraged by the addition of a water source or sources in areas lacking water but featuring other requisite habitat characteristics (e.g., ruggedness).

Each alternative includes a set of actions for the management or disposition of big game guzzlers in a manner that is consistent with the overall objectives of that alternative. The plans for big game guzzlers are described in detail in *Chapter 2: Alternatives* and are summarized in Table 19.

This analysis focuses on the change in modeled dry season habitat under the different alternatives. With this approach, the NPS can quantify changes in the value of available dry season habitat and can draw general conclusions about the effects of those changes on sheep populations. However, this analysis does not attempt to quantify the effects of dry season habitat value changes on the size of bighorn populations, the amount of habitat, the health of bighorn populations, or the number of individual animals that would be affected. That level of analysis would require detailed and complex multiyear studies of each bighorn population to observe and document changes in population size or health. Such studies would require time-intensive or cost-prohibitive monitoring (field observations and GPS data); would be confounded by external variables including precipitation and forage variability, long-term climate change, and disease; and would be limited to only a few population units at a time. Instead, for the purposes of this analysis, the NPS elected to analyze the change in modeled dry season habitat, which can be used as an indicator of change for bighorn populations.

Table 19. Summary of Implementation Actions for Big Game Guzzlers

Guzzler	Alternative 2	Alternative 3 (Preferred Alternative)	Alternative 4
Clark	Remove	Remove	Remove
Piute	Remove	Remove	Retain
Old Dad	Remove	Retain	Retain
Kelso	Retain	Retain	Retain
Kerr	Relocate	Relocate	Relocate
Vermin	Relocate	Relocate	Relocate
New Water Sources	Two sites outside wilderness	Three sites outside wilderness	Two sites outside wilderness
Total Guzzlers	5	7	7
Within wilderness	1	2	4
Outside wilderness	4	5	3

Cumulative Impacts Common to All Alternatives

The past, present, and reasonably foreseeable future actions that may result in cumulative impacts on bighorn sheep within the Preserve are listed in Table 17 and are discussed in *Chapter 3: Affected Environment* in the “Regional Context” section. The activities that have affected and would continue to affect desert bighorn sheep resources are human development and disturbance, which include existing and proposed infrastructure, solar energy development,

and military, industrial, agricultural, and mining projects; land management plans and actions; and Preserve projects and plans, which include designation of national monuments, resource management plans, and Preserve-sponsored projects.

Human Development and Disturbance

As discussed in *Chapter 3: Affected Environment*, desert bighorn sheep tend to use lower-elevation bajadas and alluvial fans to forage, in addition to the rocky steep mountain slopes, and may move significantly among mountain ranges (Bleich et al. 1990). Human development within the Mojave Desert region poses substantial barriers to sheep migration and the ability of individuals and herds to access adequate forage during dry seasons. Human-wildlife conflict may increase as a result of development, and individuals and herds may be deterred from migration corridors by human presence and development. While these activities taken together would result in local to regional long-term adverse impacts on the species, none of the alternatives would significantly alter the level of impacts on bighorn sheep populations when compared with existing conditions.

Existing and Proposed Infrastructure

The Mojave Desert region is crossed by transmission lines and energy infrastructure that is associated with energy development, highways, railways, canals and aqueducts, and small population centers, in addition to mines, military installations, and industrial solar development (discussed below). These developments have resulted in habitat fragmentation, habitat loss, reduced reproductive success, and potential mortality of individual bighorn sheep by creating barriers for herds and individuals that may cross areas to access water and forage. While these activities taken together would result in local to regional long-term adverse impacts on the species, none of the alternatives would significantly alter the level of impacts on bighorn sheep populations when compared with existing conditions.

Solar Energy Development and Plans

The three existing and one proposed industrial-scale solar energy developments close to the Preserve, including the solar energy development zones (SEZs) identified in the Desert Renewable Energy Conservation Plan (DRECP), are located in valleys below mountain ranges both within and outside of the Preserve (see Figure 1). Solar energy development in the Mojave Desert region poses long-term adverse impacts on bighorn sheep populations similarly to the impacts from infrastructure through habitat fragmentation, habitat loss, reduced reproductive success, and potential mortality of individual bighorn sheep by creating barriers for herds and individuals that may cross areas to access water and forage.

Military, Industrial, Agricultural, and Mining Projects

The presence and development of military installations, mines, and industrial and agricultural facilities in the Mojave Desert region poses long-term adverse impacts on bighorn sheep populations similarly to the impacts from infrastructure and solar development: habitat fragmentation, habitat loss, reduced reproductive success, and potential mortality of individual bighorn sheep by creating barriers for herds and individuals that may cross areas to access water and forage.

Land Management Plans and Actions

The designation of the Mojave Trails, Sand to Snow, and Castle Mountain National Monuments establishes areas within the Mojave Desert region and close to the Preserve where desert bighorn sheep habitat would be left undeveloped, thus providing corridors for sheep to migrate

for forage and water if needed. Castle Mountain, located adjacent to the east side of the Preserve, contributes to habitat connectivity between the New York, Castle, and Piute mountain ranges, as well as to the Lanfair Valley. Several water features are in the eastern portion of the Preserve close to Castle Mountain National Monument. The Mojave Trails National Monument would provide potential habitat connectivity among the mountain ranges to the south and west of the Preserve. The Sand to Snow National Monument, located west of the Preserve, would likely have a less notable effect on habitat connectivity due to its distance from the Preserve. All of the alternatives would beneficially, although not significantly, alter the level of impact from these new designations. Nuances to the ways the alternatives would alter the level of impact are discussed under each alternative below.

Impacts of the Alternatives

Alternative 1 – No Action

Under the No Action Alternative, all six big game guzzlers would remain in place. Management and repair of guzzlers, including emergency filling and repairs, would occur on an as-needed basis. Continuation of current management and existing conditions under the No Action Alternative would not affect the amount or availability of dry season habitat available to bighorn sheep populations.

Cumulative Impacts

The cumulative impacts from past, present, and reasonably foreseeable future actions that are caused by human disturbance in the region, and by the implementation of Preserve projects and plans, are the same for all alternatives and are discussed above in the “Cumulative Impacts Common to All Alternatives” section.

While human disturbance and development projects would result in local to regional long-term adverse impacts on bighorn sheep, the No Action Alternative would not alter the level of the impacts in that it would not further inhibit bighorn movement or reduce habitat availability. Likewise, the No Action Alternative, with its passive and ad hoc approach to management, would not alter the regional long-term beneficial impacts from new national monument designations.

Conclusion

Overall, the No Action Alternative would be a continuation of the existing management approach, resulting in no effects on bighorn sheep populations in the Preserve compared with the existing conditions. The No Action Alternative would beneficially but not significantly alter the level of cumulative effects from human disturbance and the implementation of other plans and projects.

Alternative 2

At full implementation, Alternative 2 would include the removal of the Clark, Piute, and Old Dad guzzlers and the relocation of the Kerr and Vermin guzzlers to outside of wilderness (Figure 22). The Kelso guzzler would remain in place. Two new potential guzzlers (Ginn and Vontrigger) would be considered outside of wilderness for native wildlife habitat connectivity, including bighorn sheep. Each of these actions would occur in a deliberate and stepwise fashion, supported by monitoring and evaluation, to ensure that the intended changes in water availability are achieved without resulting in unacceptable impacts on bighorn populations, as outlined above in *Chapter 2: Alternatives* and in Figure 3. To achieve the desired outcome of minimizing wilderness intrusion while maintaining sustainable bighorn populations, Alternative 2

focuses on the strategic relocation of existing guzzlers and establishment of new guzzlers to support bighorn populations.

Preserve-Wide Dry Season Habitat Value

At full implementation of all big game guzzler actions, Alternative 2 would result in a 10 percent decrease in dry season habitat value, compared to existing conditions (see Figure 22 and Table 18). The removal of Clark, Piute, and Old Dad would decrease habitat value by 44 percent, while the relocation of Vermin (to New Vermin) and Kerr (to New Kerr) would increase habitat value by 6 percent. The development of the Ginn and Vontrigger guzzlers would increase habitat value by 29 percent. The 10 percent decrease in the overall dry season habitat value would result in a relatively small loss of dry season habitat value in the Preserve, with more substantial local effects on dry season habitat values.

Old Dad/Kelso Mountains

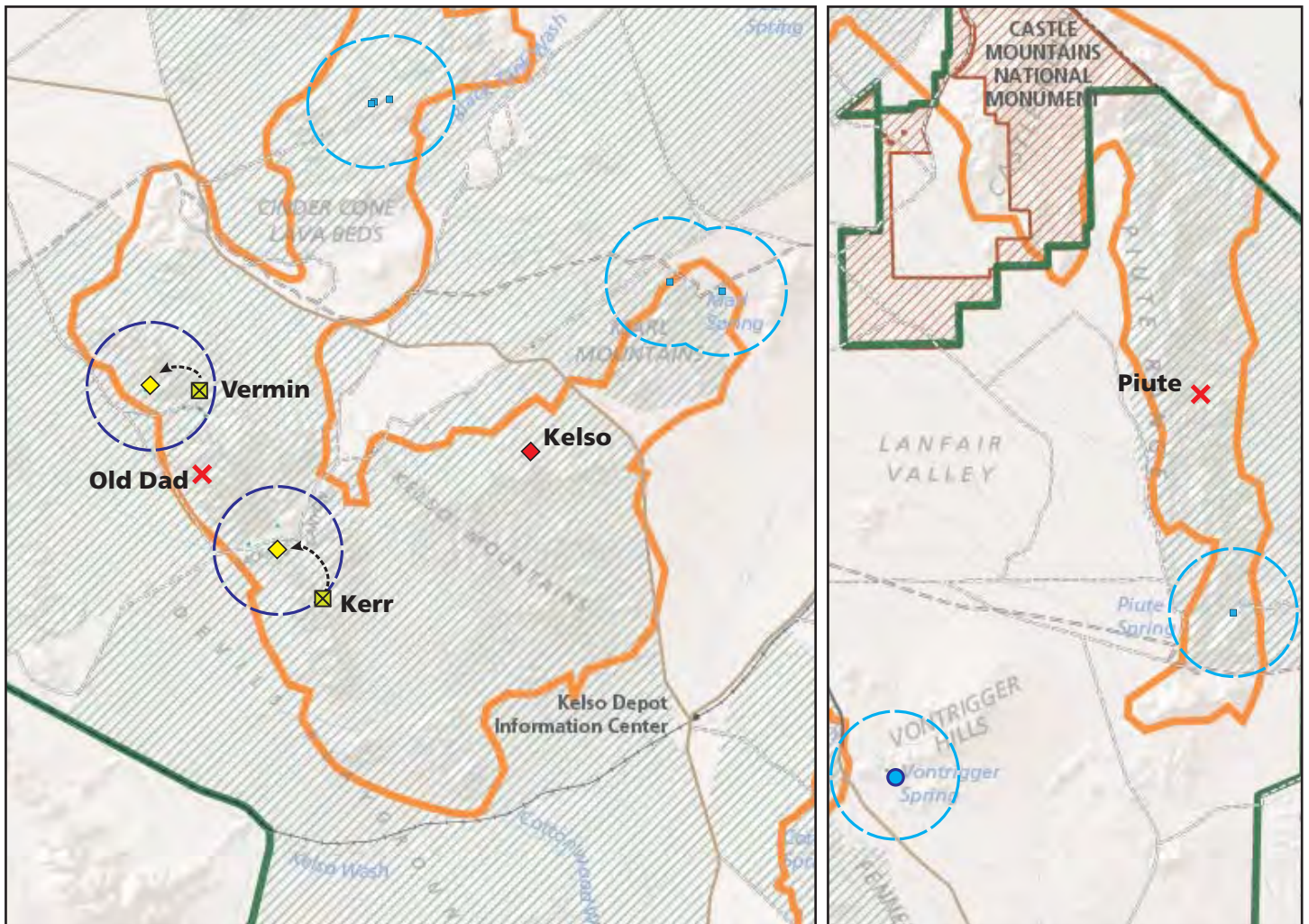
The Old Dad/Kelso Mountain area would experience a decrease of 35 percent in dry season habitat value for the area, mostly from the removal of the Old Dad guzzler. The Old Dad guzzler accounts for about 22 percent of the overall habitat value, but 28 percent of the Old Dad/Kelso Mountains habitat value. The relocation of the Vermin guzzler to New Vermin and Kerr guzzler to New Kerr would result in a combined increase of 6 percent. The Kelso guzzler would continue to support dry season habitat in its present location.

The deactivation of the Old Dad guzzler would result in short-term adverse effects on bighorn individuals and populations accustomed to that particular water source, which would likely result in potential impacts on sheep reproduction and survival of individuals and populations. The NPS expects that most animals and groups of bighorn would use the relocated New Vermin and New Kerr guzzlers, which would be located within or near the 2.5-kilometer radius of the Old Dad guzzler. The removal of the Old Dad guzzler would be completed following the implementation sequence described in *Chapter 2: Alternatives*, only after monitoring has indicated that nearly all bighorn have discovered and are using the New Vermin and New Kerr water sources.

The discovery and use transition from Vermin and Kerr to the relocated New Vermin and New Kerr guzzlers may result in short-term stress to the population, including reduced reproductive success and mortality of some individuals that do not easily adapt to the new location. These changes, however, would be followed by the implementation sequence outlined in Figure 3 and described in *Chapter 2: Alternatives*. The transition to the relocated water sources would take place over an extended period with monitoring of the existing and new guzzler sites to evaluate the discovery and use of the relocated water sources by bighorn. Therefore, while the relocation of two guzzlers would be expected to result in short-term adverse effects on some individuals, the NPS would not allow severe long-term consequences to the overall Old Dad/Kelso population by following the implementation sequence and monitoring. If monitoring indicated that long-term adverse conditions or trends in the population would occur, site-specific mitigation measures, including the reinstatement of existing guzzlers, would be used to avoid significant and adverse long-term effects.

Clark Mountains

The Clark guzzler is not heavily used by bighorn, and additional monitoring of the Clark guzzler would take place before it is deactivated and removed to ensure that bighorn use of the guzzler is rare and adverse impacts would not result. The removal of the Clark guzzler would follow the implementation sequence described in Figure 3 and outlined in *Chapter 2: Alternatives*, and would be subject to site-specific compliance under NEPA and NPS guidance.



- ◆ Retain guzzler
- ✗ Remove guzzler
- ◻ Relocate guzzler
- ◆ Guzzler relocation site
- New water source location
- Springs used by bighorn

- ▭ Mojave National Preserve boundary
- ▭ Bighorn sheep habitat patches (Creech et al. 2014)
- ▨ National Park Service wilderness
- 2,500m water source buffer

Mescal/Ivanpah Range

The addition of a water source at Ginn Mine in the Mescal/Ivanpah Range would increase the habitat value in the area. There are no existing guzzlers or developed water sources in this area. The new Ginn water source may support the establishment of a new population in this area, would increase habitat connectivity on the Preserve and the surrounding areas, and would increase the potential for habitat connectivity across I-15 to the north.

Woods/Hackberry Mountains

A new water source at Vontrigger Spring would result in an increase in habitat value in the Woods/Hackberry Mountains. There are no existing guzzlers or developed water sources in this area. The new Vontrigger water source may support the expansion, health, and viability of the area's existing bighorn population; increase habitat connectivity on the Preserve and the surrounding areas; and increase the potential for habitat connectivity across I-40 to the south.

Piute/Castle Mountains

The removal of the Piute guzzler would result in a decrease in dry season habitat value in the area. The Piute guzzler is the only existing developed water source in the area; however, the Piute Springs are nearby undeveloped water sources that support dry season habitat for bighorn. While the NPS expects that most sheep would successfully shift to Piute Springs, some short-term adverse impacts on sheep would be expected during the transition. Deactivation of the Piute guzzler would take place following the process described in *Chapter 2: Alternatives*, and may require monitoring of bighorn through deployment of GPS collars and additional studies, as well as site-specific compliance. There are currently no collared bighorn in the area. If monitoring indicates long-term adverse impacts on sheep and the overall population, or if nearly all bighorn sheep do not discover and use the spring and creek, the Piute guzzler would be reinstated to mitigate any significant impact.

New Water Sources

As discussed above, the two new potential water sources at Vontrigger Spring and Ginn Mine would increase the dry season habitat value in the Woods/Hackberry Mountains and Mescal/Ivanpah Range, respectively, and in the Preserve overall. These new water sources would contribute 29 percent to the overall value of the Preserve's dry season habitat (see Figure 20) and would have a greater impact on dry season habitat value in the areas where they are located. The increases in the area's habitat value would help support regional migration corridors within the Preserve and with other populations to the north and south. In addition, these new non-wilderness water sources could promote the expansion of existing populations in the Woods/Hackberry Mountains and the establishment of a new population in the Mescal/Ivanpah Range. Over the long term, these actions are expected to benefit desert bighorn sheep by expanding populations and improving interpopulation movement and regional metapopulation stability. The timing and magnitude of these benefits are uncertain, but could contribute to long-term bighorn conservation.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that are considered cumulatively with the effects of Alternative 2 include human disturbance and development and changes to land management plans and actions, particularly the creation of the adjacent Castle Mountains National Monument. Human disturbance and development would continue to have long-term adverse impacts on bighorn sheep by reducing habitat and habitat connectivity in the Mojave

Desert region. Regional impacts on habitat connectivity and migration would be both adversely and beneficially impacted by Alternative 2.

The 10 percent decrease in dry season habitat value would not significantly alter the level of impact from regional human disturbance or Preserve projects and plans, compared with existing conditions. While the dry season habitat value within the Preserve and in the Old Dad/Kelso Mountain, Piute/Castle Mountain, and Clark Mountain areas may result in more pronounced local negative contributions to overall regional impacts, the increase in dry season habitat value from the new water sources at Ginn Mine and Vontrigger Spring would contribute to improved regional habitat connectivity, and to the habitat value in within the Woods/Hackberry Mountains and the Mescal/Ivanpah Range.

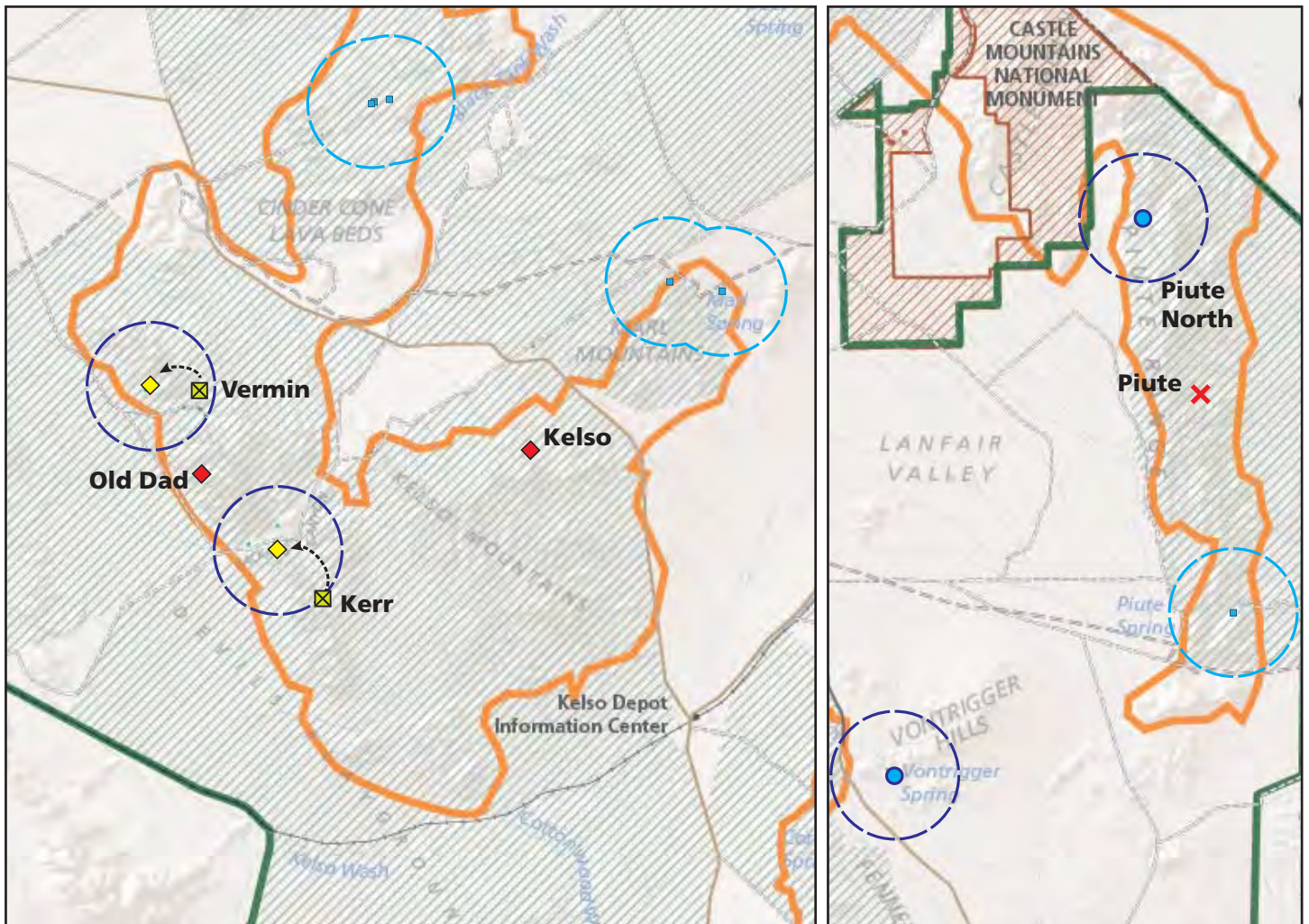
Conclusion

Full implementation of Alternative 2 would result in an overall 10 percent reduction in available dry season habitat across the Preserve. While the Old Dad/Kelso Mountains and Piute/Castle Mountains would experience decreases in dry season habitat value, the long-term improvement of dry season habitat value in the Mescal/Ivanpah Range and Woods/Hackberry Mountains could benefit bighorn populations by improving regional movement and metapopulation stability. The decrease in dry season habitat value would largely be the result of the removal of the Old Dad guzzler and the Piute guzzler. The Clark guzzler is not heavily used by bighorn and would not substantially contribute to the cumulative effects. As a result of implementation and monitoring, the increases in habitat value within the Mescal/Ivanpah Range and Woods/Hackberry Mountains areas, and strategic placement of new water sources, the reduction in dry season habitat would not result in significant adverse effects on bighorn sheep. Overall, no significant adverse cumulative effects are anticipated under Alternative 2.

The NPS expects that the relocation, deactivation, and removal of existing guzzlers could result in short-term adverse effects on some bighorn individuals, including stress, mortality, and reduced lambing rates. Each action would be planned and implemented to avoid the risk of severe impacts on populations. Short-term adverse effects would be balanced and offset by the long-term benefits that would result from relocated guzzlers. The relocation, deactivation, or removal of any guzzler would be subject to site-specific design, implementation, and monitoring, and would be subject to additional compliance under NEPA and NPS guidance (see *Chapter 2: Alternatives*).

Alternative 3 (Preferred Alternative)

Alternative 3 would be similar to Alternative 2 except that the Old Dad guzzler would not be removed, and an additional new water source, the Piute North guzzler, would be implemented in the Piute/Castle Mountains. At full implementation, Alternative 3 would include the removal of the Clark and Piute guzzlers and the relocation of the Kerr and Vermin guzzlers to outside of wilderness (Figure 23). The Old Dad and Kelso guzzlers would remain in place. Three new potential guzzlers (Ginn, Vontrigger, and Piute North) would be considered outside of wilderness for native wildlife habitat connectivity, including bighorn sheep. Each of these actions would occur in a deliberate and stepwise fashion, supported by monitoring and evaluation, to ensure that the intended changes in water availability are achieved without resulting in unacceptable impacts on bighorn populations, as outlined above in *Chapter 2: Alternatives* and Figure 3 and Figure 4. To achieve the desired outcomes of ensuring stable wildlife populations, reducing water developments in wilderness, and improving regional habitat connectivity, Alternative 3 utilizes a blended strategic approach of removals, relocations, retained guzzlers, and new water sources.



- ◆ Retain guzzler
- ✗ Remove guzzler
- ⊠ Relocate guzzler
- ◆ Guzzler relocation site
- New water source location
- Springs used by bighorn
- ▭ Mojave National Preserve boundary
- ▭ Bighorn sheep habitat patches (Creech et al. 2014)
- ▨ National Park Service wilderness
- 2,500m water source buffer

Preserve-Wide Dry Season Habitat Value

At full implementation of all big game guzzler actions, Alternative 3 would result in a 19 percent increase in dry season habitat value on the Preserve, compared with existing conditions (see Figure 21 and Table 18). The removal of Clark and Piute would decrease habitat value by 23 percent. The relocated New Vermin and New Kerr guzzlers would have slightly less habitat value than the existing Kerr and Vermin guzzlers, due to the continued value of the Old Dad guzzler within proximity to the relocated guzzlers.

The addition of the Piute North, Ginn, and Vontrigger guzzlers would increase habitat value by 47 percent. The increase in the overall dry season habitat value would result in a substantial beneficial overall effect on dry season habitat value on the Preserve, while a variation of effects would occur at smaller scales.

Old Dad/Kelso Mountains

The Old Dad/Kelso Mountain area would experience a decrease of 7 percent in dry season habitat value for the area when compared to the No Action Alternative. This decrease would come from the relocation of the Kerr (to New Kerr) and Vermin (to New Vermin) guzzlers, which would have slightly lower dry season habitat value compared to the existing guzzlers. The Kelso and Old Dad guzzlers would continue to support dry season habitat in their present locations.

As with Alternative 2, the discovery and use transition from Vermin and Kerr to the relocated New Vermin and New Kerr guzzlers may result in short-term stress to the population, including reduced reproductive success and mortality of some individuals that do not easily adapt to the new location. These changes, however, would be followed by the implementation sequence outlined in Figure 3 and Figure 4 and described in *Chapter 2: Alternatives*. The transition to the relocated water sources would take place over an extended period with monitoring of the existing and new guzzler sites to evaluate the discovery and use of the relocated water sources by bighorn. Therefore, while the relocation of two guzzlers would be expected to result in short-term adverse effects on some individuals, the NPS would not allow severe long-term consequences to the overall Old Dad/Kelso population. If monitoring indicated that long-term adverse conditions or trends in the population would occur, mitigation measures, including the reinstatement of existing guzzlers, would be used to avoid significant and adverse long-term effects.

Clark Mountains

The effects on the Clark Mountains would be identical to Alternative 2. The Clark guzzler is not heavily used by bighorn, and additional monitoring of the Clark guzzler would take place before it is deactivated and removed to ensure that bighorn use of the guzzler is rare and adverse impacts would not result. The removal of the Clark guzzler would follow the implementation sequence described in Figure 3 and outlined in *Chapter 2: Alternatives*, and would be subject to site-specific compliance under NEPA and NPS guidance.

Mescal/Ivanpah Range

The effects on the Mescal/Ivanpah Range would be identical to Alternative 2. The addition of a water source at Ginn Mine in the Mescal/Ivanpah Range would increase the habitat value in the area. There are no existing guzzlers or developed water sources in this area. The new Ginn water source may support the establishment of a new population in this area, would increase habitat connectivity on the Preserve and the surrounding areas, and would increase the potential for habitat connectivity across I-15 to the north.

Piute/Castle Mountains

The addition of the Piute North guzzler would increase the habitat value in the Piute/Castle Mountains area by about 7 percent, compared to the habitat value in the area under the No Action Alternative. The loss of habitat value from the removal of the existing Piute guzzler would be offset by the installation of Piute North, resulting in an increase in dry season habitat value for the area.

As with Alternative 2, the removal of the Piute guzzler would result in a decrease in dry season habitat value in the area. The existing Piute guzzler is the only developed water source in the area; however, the Piute Springs are nearby undeveloped water sources that support dry season habitat for bighorn. The Piute North guzzler would be installed before the Piute guzzler was deactivated and removed, providing an additional water source for bighorn in the area. While the NPS expects that most sheep would successfully shift to Piute Springs and Piute North, some short-term adverse impacts on sheep would be expected during the transition.

Deactivation of the Piute guzzler would take place following the process described in *Chapter 2: Alternatives*, and may require monitoring of bighorn through deployment of GPS collars and additional studies, as well as site-specific compliance. There are currently no collared bighorn in the area. If monitoring indicates long-term adverse impacts on sheep and the overall population, or if nearly all bighorn sheep do not discover and use the spring and creek, the Piute guzzler would be reinstated to mitigate any significant impact.

New Water Sources

As discussed above, the development of three new potential water sources at Vontrigger Spring, Piute North, and Ginn Mine would increase the Preserve's dry season habitat value by 47 percent and could help support regional migration corridors within the Preserve and to other populations to the north and south. In addition, these new non-wilderness water sources could promote the expansion of existing populations in the Piute/Castle Mountains and Woods/Hackberry Mountains, and the establishment of a new population in the Mescal/Ivanpah Range. The Piute North guzzler would offset the loss of habitat value from the deactivation and removal of the existing Piute guzzler. Over the long term, these actions are expected to benefit desert bighorn sheep by expanding populations and improving interpopulation movement and regional metapopulation stability. The timing and magnitude of these benefits are uncertain, but they could contribute to long-term bighorn conservation.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that are considered cumulatively with the effects of Alternative 3 include human disturbance and development and changes to land management plans and actions, particularly the creation of the adjacent Castle Mountains National Monument. Human disturbance and development would continue to have long-term adverse impacts on bighorn sheep by reducing habitat and habitat connectivity in the Mojave Desert region. Those regional impacts would be reduced by efforts in Alternative 3 to improve regional migration corridors and connectivity.

The 19 percent increase in dry season habitat value under Alternative 3 may benefit regional habitat conditions, potentially offsetting some of the impacts from regional human disturbance or Preserve projects and plans, compared with existing conditions. The decreases in dry season habitat value within the Old Dad/Kelso and Clark areas are not likely to result in substantial contributions to the regional trends. The decrease in habitat value in the Old Dad/Kelso area would be slight, and the Clark guzzler is not heavily used by bighorn. Increases in habitat value

in the Piute/Castle, Mescal/Ivanpah, and Woods/Hackberry areas may result in local beneficial contributions to overall regional impacts. The increase in dry season habitat value from the new water sources at Piute North, Ginn Mine, and Vontrigger Spring would contribute to improved regional habitat connectivity, as well as to the habitat value in the Woods/Hackberry Mountains and the Mescal/Ivanpah Range.

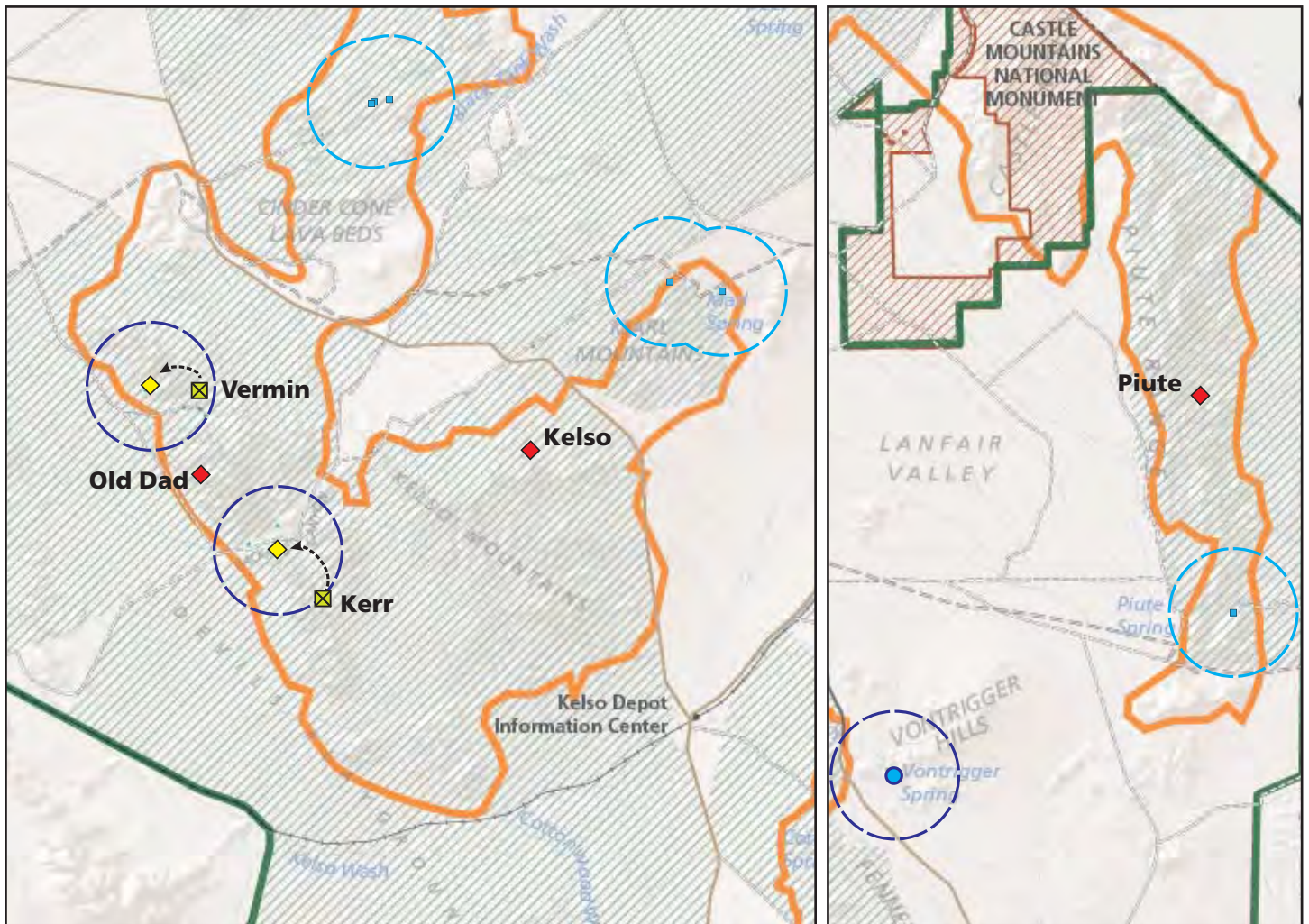
Conclusion

Full implementation of Alternative 3 would result in a 19 percent increase in dry season habitat value across the Preserve. While the Old Dad/Kelso Mountains would experience a slight decrease in dry season habitat value, the long-term improvement of dry season habitat value in the Piute/Castle Mountains, Mescal/Ivanpah Range, and Woods/Hackberry Mountains could benefit bighorn populations by improving regional movement and metapopulation stability. The Clark guzzler is not heavily used by bighorn and would not substantially contribute to the cumulative effects. This expansion in dry season habitat, combined with the implementation and monitoring protocol, would benefit bighorn sheep in the Preserve. As a result of the increases in the Preserve's overall habitat value through strategic placement of new water sources, Alternative 3 would result in significant beneficial effects on bighorn sheep in the Preserve. The increase in dry season habitat and connectivity in Alternative 3 would potentially offset some of the cumulative effects of regional habitat loss, though the overall cumulative benefit on regional populations would be limited.

The NPS expects that the relocation, deactivation, and removal of existing guzzlers could result in short-term adverse effects on some bighorn individuals, including stress, mortality, and reduced lambing rates. Each action would be planned and implemented to avoid the risk of severe impacts on populations. Short-term adverse effects would be balanced and offset by the long-term benefits that would result from relocated guzzlers. The relocation, deactivation, or removal of any guzzler would be subject to site-specific design, implementation, and monitoring, and would be subject to additional compliance under NEPA and NPS guidance (see *Chapter 2: Alternatives*).

Alternative 4

Alternative 4 would be similar to Alternative 3 except that the Piute guzzler would not be removed, and the Piute North guzzler would not be implemented. At full implementation, Alternative 4 would include the removal of the Clark guzzler and the relocation of the Kerr and Vermin guzzlers to locations outside of wilderness (Figure 24). The Kelso and Old Dad guzzlers would remain in place. Two new potential guzzlers (Ginn and Vontrigger) would be considered outside of wilderness for native wildlife habitat connectivity, including bighorn sheep. Each of these actions would occur in a deliberate and stepwise fashion, supported by monitoring and evaluation, to ensure that the intended changes in water availability are achieved without resulting in unacceptable impacts on bighorn populations, as outlined above in *Chapter 2: Alternatives* and in Figure 3. To achieve the desired outcome of augmenting existing habitat in the Preserve and maintaining or developing connections between the Preserve and surrounding habitat in the larger landscape, Alternative 4 focuses on the strategic relocation and maintenance of existing guzzlers, and establishment of new guzzlers to support bighorn populations.



- ◆ Retain guzzler
- ✗ Remove guzzler
- ⊠ Relocate guzzler
- ◆ Guzzler relocation site
- New water source location
- Springs used by bighorn

- ▭ Mojave National Preserve boundary
- ▭ Bighorn sheep habitat patches (Creech et al. 2014)
- ▨ National Park Service wilderness
- 2,500m water source buffer

Preserve-Wide Dry Season Habitat Value

At full implementation of all big game guzzler actions, Alternative 4 would result in an 18 percent increase in dry season habitat value, compared to existing conditions (see Figure 21 and Table 18). The removal of the Clark guzzler would decrease in habitat value by 5 percent, while the relocation of Vermin (to New Vermin) and Kerr (to New Kerr) would decrease habitat value by 5 percent. The addition of the Ginn and Vontrigger guzzlers would increase habitat value by 29 percent. The increase in the overall dry season habitat value would result in a substantial beneficial overall effect on dry season habitat value on the Preserve, while a variation of effects would occur at smaller scales.

Old Dad/Kelso Mountains

The effects on the Old Dad/Kelso Mountain area would be identical to Alternative 3, with a slight decrease of 7 percent in dry season habitat value for the area when compared to the No Action Alternative. This decrease would come from the relocation of the Kerr (to New Kerr) and Vermin (to New Vermin) guzzlers, which would have slightly lower dry season habitat value compared to the existing guzzlers. The Kelso and Old Dad guzzlers would continue to support dry season habitat in their present locations.

As with Alternative 3, the discovery and use transition from Vermin and Kerr to the relocated New Vermin and New Kerr guzzler sites may result in short-term stress to the population, including reduced reproductive success and mortality of some individuals that do not easily adapt to the new locations. These changes, however, would be followed by the implementation sequence outlined in Figure 3 and Figure 4 and described in *Chapter 2: Alternatives*. The transition to the relocated water sources would take place over an extended period with monitoring of the existing and new guzzler sites to evaluate the discovery and use of the relocated water sources by bighorn. Therefore, while the relocation of two guzzlers would be expected to result in short-term adverse effects on some individuals, the NPS would not allow severe long-term consequences to the overall Old Dad/Kelso population. If monitoring indicates that long-term adverse conditions or trends in the population would occur, mitigation measures, including the reinstatement of existing guzzlers, would be used to avoid significant and adverse long-term effects.

Clark Mountains

The effects on the Clark Mountains would be identical to Alternatives 2 and 3. The Clark guzzler is not heavily used by bighorn, and additional monitoring of the Clark guzzler would take place before it is deactivated and removed to ensure that bighorn use of the guzzler is rare and adverse impacts would not result. The removal of the Clark guzzler would follow the implementation sequence described in Figure 3 and outlined in *Chapter 2: Alternatives*, and would be subject to site-specific compliance under NEPA and NPS guidance.

Mescal/Ivanpah Range

The effects on the Mescal/Ivanpah Range would be identical to Alternatives 2 and 3. The addition of a water source at Ginn Mine in the Mescal/Ivanpah Range would increase the habitat value in the area. There are no existing guzzlers or developed water sources in this area. The new Ginn water source may support the establishment of a new population in this area, would increase habitat connectivity on the Preserve and the surrounding areas, and would increase the potential for habitat connectivity across I-15 to the north.

Woods/Hackberry Mountains

The effects on the Woods/Hackberry Mountains would be identical to Alternatives 2 and 3. A new water source at Vontrigger Spring would result in an increase in habitat value in the Woods/Hackberry Mountains. There are no existing guzzlers or developed water sources in this area. The new Vontrigger water source may support the expansion, health, and viability of the area's existing bighorn population; increase habitat connectivity on the Preserve and the surrounding areas; and increase the potential for habitat connectivity across I-40 to the south.

Piute/Castle Mountains

There would be no change to dry season habitat value in the Piute/Castle Mountains. The Piute guzzler is the only existing developed water source in the area and would remain in its present location and be maintained as needed. The Piute Springs are nearby undeveloped water sources that also support dry season habitat for bighorn.

New Water Sources

The effects of the new water sources would be identical to Alternative 2. The two potential new water sources at Vontrigger Spring and Ginn Mine would increase the dry season habitat value in the Woods/Hackberry Mountains and Mescal/Ivanpah Range, respectively, and in the Preserve overall. These new water sources would contribute 29 percent to the overall value of the Preserve's dry season habitat (see Figure 21) and would have a greater impact on dry season habitat value in the areas where they are located. The increases in the areas' habitat values would help support regional migration corridors within the Preserve and with other populations to the north and south. In addition, these new non-wilderness water sources could promote the expansion of existing populations in the Woods/Hackberry Mountains and the establishment of a new population in the Mescal/Ivanpah Range. Over the long term, these actions are expected to benefit desert bighorn sheep by expanding populations and improving interpopulation movement and regional metapopulation stability. The timing and magnitude of these benefits are uncertain, but they could contribute to long-term bighorn conservation.

Cumulative Impacts

Past, present, and reasonably foreseeable future actions that should be considered cumulatively with the effects of Alternative 4 include ongoing human disturbance and development in the region, creation of the adjacent Castle Mountains National Monument, and implementation of Preserve projects and plans. Human disturbance and development would continue to have long-term adverse impacts on bighorn sheep by reducing habitat and habitat connectivity in the Mojave Desert region. Those regional impacts would be reduced by efforts in Alternative 4 to improve regional migration corridors and connectivity.

The 18 percent increase in the Preserve's dry season habitat value under Alternative 4 may benefit regional habitat conditions, potentially offsetting some of the impacts from regional human disturbance or Preserve projects and plans, compared with existing conditions. The decreases in dry season habitat value within the Old Dad/Kelso and Clark areas are not likely to result in substantial contributions to the regional trends. Increases in habitat value in the Piute/Castle, Mescal/Ivanpah, and Woods/Hackberry areas may result in local beneficial contributions to overall regional impacts. The increase in dry season habitat value from the new water sources at Ginn Mine and Vontrigger Spring would contribute to improved regional habitat connectivity, as well as to the habitat value in the Woods/Hackberry Mountains and the Mescal/Ivanpah Range.