No Action
This alternative would leave 1,702.1 miles of routes open in the Project Area. An additional 7.1 miles of routes would be limited to authorized users, and 35.2 miles of routes would be limited seasonally. It would not provide route-by-route or species-specific management action changes based on consideration of migratory birds.

Proposed Action
The Proposed Action would designate 991 miles of open routes in the Project Area. An additional 190.4 miles of routes would be limited to authorized users, and 47.6 miles would be limited to non-mechanized or foot travel only.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes in the Project Area. An additional 314.4 miles of routes would be limited to authorized users, and 10.6 miles would be limited to non-mechanized or foot travel only.

Access Alternative
This alternative would designate 1,417.7 miles of open routes in the Project Area. An additional 109 miles of routes would be limited to authorized users, and 52.1 miles would be limited to non-mechanized or foot travel only.

3.3.6 Noxious and Invasive Non-Native Species

Affected Environment

Invasive and noxious weeds are plants that are not native to Arizona and were introduced. Within the Project Area, invasive and noxious weed species are present. Some weeds are poisonous to wildlife, livestock, and people. Noxious weeds are listed by state and federal law, and are generally considered exotics that negatively affect agriculture, navigation, fish, wildlife, or public health. Federally regulated and restricted invasive species that occur within the Project Area include Downy brome or Cheatgrass (*Bromus tectorum*), Musk thistle (*Carduus nutans*), Russian knapweed (*Acroptilon repens*), Saltcedar (*Tamarix spp*.), Scotch thistle (*Onopordum acanthium*), Spotted knapweed (*Centaurea maculosa*), and Yellow star thistle (*Centaurea solstitialis*). Arizona restricted and regulated weeds include Puncturevine (*Tribulus terrestris*), Camelthorn (*Alhagi maurorum*), Diffuse knapweed (*Centaurea diffusa*), Dodder (*Cuscuta spp*.), and Halogeton (*Halogeton glomeratus*). Aquatic and wetland invasive species include Commonreed (Phragmites australis), Eurasian water-milfoil (*Myriophyllum spicatum*), Giant-reed (*Arundo donax*), and Giant salvinia (*Salvinia molesta*).

Other invasive weeds such as Buffelgrass (Cenchrus ciliaris), Red brome (*Bromus madritensis ssp. rubens*), African mustard (*Brassica tournefortii*), Fountain grass (*Pennisetum alopecuroides*), and Wild oat (*Avena fatua*) are not listed as noxious, but still can be problematic on Arizona lands. These plants are considered invasive weeds because they displace and reduce the normal composition and productivity of native vegetation. They may also raise the risk of wildland fire because of increased flammability and biomass accumulation in the vegetation communities.

Natural vectors for weed seed spread include wind, flowing water, and native wildlife. Anthropogenic vectors include livestock, hikers, agricultural equipment and OHVs. Seeds from weed species are often carried in the radiator, undercarriage, within tire treads, and/or are attached to OHVs, recreational vehicles, trailers or equipment by mud and other means. Seeds or weeds can also be carried in livestock forage transported into a weed-free area. These seed sources fall from the vehicles and are often able to establish in areas where the species did not exist prior to motorized use. In addition, cross-country or off-route travel by OHVs creates soil disturbance, often allowing weed species to spread and germinate

Environmental Consequences

Effects Common to All Alternatives

Direct effects of travel route designations on the spread of noxious and invasive non-native species include seed spread from vehicles, equipment (such as stock trailers, camp trailers, RVs, etc.) and users. Route designations should reduce unintended off-route use and route creation, which could directly result in soil and vegetation disturbance, creating more opportunity for invasive species to take hold.

Indirect effects include dusting of native vegetation, which can lead to plant mortality and replacement by invasive species, and increased potential of wildfire from expanded access, which can lead to post-fire propagation, and spread of invasive species.

No data is available on presence or absence of noxious and invasive non-native species in specific locations across the Project Area, or on the susceptibility of different areas to the spread of those species. For context on relative impacts of different designations, consult the table in the Travel Management section of this EA, which shows overall Project Area designations. Alternatives with greater mileages of open routes would allow increased access, increasing the potential for spread of noxious and invasive non-native species. Conversely, alternatives with more closed routes would make access for any efforts to control those species more difficult, which may allow them to become established in areas without at least administrative access for vehicles.

3.3.7 Threatened or Endangered Species

Affected Environment

Project Area lands serve as habitat for several animal species with Federal “threatened” or “endangered” status under the Endangered Species Act (ESA). The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. The following threatened or endangered species are present in the Project Area and received species-specific consideration during route evaluation:

- Mojave desert tortoise (*Gopherus agassizzi*) – Threatened
- Northern Mexican gartersnake (*Thamnophis eques*) - Threatened
- Southwestern willow flycatcher (*Empidonax traillii extimus*) – Endangered
- Yellow-billed cuckoo (*Coccyzus americanus*) (western distinct population segment) – Threatened
- Yuma Ridgway’s clapper rail (*Rallus longirostris yumanensis*) – Endangered

Desert tortoises are a keystone species and provide habitat for many other species via their burrowing systems (BLM 2007). Both the Sonoran desert tortoise (*Gopherus morafkai*) (a BLM sensitive species) and Mojave desert tortoise (*Gopherus agassizzi*) (threatened under the ESA) occur in the Project Area. Sonoran Desert tortoise live southeast of the Colorado River, while Mojave desert tortoise live northwest of it.

Approximately 376,217 acres of desert tortoise habitat exist in the Project Area. Of these, approximately 352,528 acres are Sonoran desert tortoise habitat, and approximately 23,690 acres are Mojave desert tortoise habitat. Approximately 2,577 acres of OHV open areas in the Project Area are in desert tortoise habitat with approximately 179 of these acres in Sonoran desert tortoise Category III habitat, and approximately 2,398 of these acres in Mojave desert tortoise Category III habitat. Most Sonoran desert tortoise habitat in the Project Area is in the northern half, with some large separate distributions in the southern half. Mojave desert tortoise habitat occurs in the northwestern portion of the Project Area in California. See Maps 14 and 15 in Appendix B for the location of desert tortoise habitat within the Project Area and associated route network.

Environmental Consequences

Resource-Specific Assumptions and Methodologies

GIS habitat data was used to analyze route mileage in or proximate to most threatened or endangered species habitats. Yuma Ridgway's clapper rail habitat overlaps much of the southwestern willow flycatcher habitat in the Project Area. Impacts for the Yuma Ridgway's clapper rail, which does not receive species-specific analysis below, would be similar to the impacts to southwestern willow flycatcher.

Effects Common to All Alternatives

Travel route designations may contribute to riparian habitat damage or loss, which would be notably adverse to all aquatic habitat-dependent threatened or endangered species listed above. Travel route designations may cause riparian habitat damage, which could include erosion, siltation, and pollution (harmful to northern Mexican gartersnake habitat) and vegetative cover removal (harmful to yellow-billed cuckoos). Disruption and fragmentation of riparian areas may also threaten isolated southwestern willow flycatcher populations, which depend on the immigration of other individuals for survival. Travel route designations may also contribute to increased recreation activities that are detrimental to threatened or endangered species and would provide access to aquatic habitat.

Sonoran and Mojave Desert Tortoise

OHV use may cause burrow abandonment. Travel route designations may also contribute to increased desert tortoise stress and mortality by providing opportunities for illegal shooting and general disruption of habitat and individuals. Travel route designations may contribute to more disruptive recreation in tortoise habitat, including rock-hounding, which may take place in rocky areas used as shelter sites (BLM Lake Havasu Field Office 2006). Travel-related disruption may also cause tortoises to void bladder contents, which could cause an unfavorable water balance and increase vulnerability.

Tables 3.7 – 3.9 below show the miles of routes in and proximate to threatened or endangered species and Sonoran Desert Tortoise habitat in the Project Area and the designations of those routes in each alternative.

Table 3.7. *Miles of Routes in or Proximate to Threatened or Endangered Species Critical Habitat*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Northern Mexican gartersnake proposed critical habitat- IN	Open	0.6	0.6	-14	-	-100	0.6	-14
	Limited to authorized users	-	-	n/a	0.6	n/a	-	n/a
	Closed	0.2	0.3	41	0.3	41	0.3	41
Northern Mexican gartersnake proposed critical habitat - Proximate to (1/4 mile)	Open	2.4	2.2	-11	0.4	-84	2.2	-11
	Limited to authorized users	-	-	n/a	1.8	n/a	-	n/a
	Limited to non-mechanized travel	-	0.3	n/a	-	n/a	0.3	n/a
	Limited - seasonal	0.1	-	-100	-	-100	-	-100
	Closed	0.2	0.3	54	0.6	236	0.3	54
Southwestern willow flycatcher proposed critical habitat - IN	Open	0.8	0.8	-	0.2	-68	0.8	-
	Limited to authorized users	-	-	n/a	0.5	n/a	-	n/a
	Limited to foot travel	-	0.01	n/a	0.01	n/a	0.01	n/a
	Closed	0.01	-	-100	-	-100	-	-100
Southwestern willow flycatcher proposed critical habitat - Proximate to (1/4 mile)	Open	6.0	3.0	-49	1.0	-84	3.7	-38
	Limited to authorized users	-	1.1	n/a	2.7	n/a	0.4	n/a
	Limited to foot travel	-	0.7	n/a	0.7	n/a	0.7	n/a
	Limited to non-mechanized travel	-	1.2	n/a	0.3	n/a	1.2	n/a
	Limited - seasonal	0.4	-	-100	-	-100	-	-100
	Closed	2.0	2.4	19	3.8	87	2.4	20
Western yellow-billed cuckoo habitat - IN	Open	1.7	1.8	4	-	-100	1.8	4
	Limited to authorized users	-	-	n/a	1.8	n/a	-	n/a
	Closed	0.1	-	-100	-	-100	-	-100
Western yellow-billed cuckoo habitat – Proximate to (1/4 mile)	Open	3.5	3.0	-13	3.0	-13	3.0	-13
	Limited to authorized users	-	0.4	n/a	-	n/a	0.4	n/a
	Closed	-	0.1	n/a	0.5	n/a	0.1	n/a

Table 3.8. *Miles of Routes in Tortoise Habitats*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Sonoran Category I	Open	9.4	6.4	- 32	2.4	- 74	7.6	- 19
	Limited to authorized users (w/mgmt.)	-	0.5	n/a	-	n/a	-	n/a
	Closed	-	2.5	n/a	6.9	n/a	1.8	n/a
Sonoran Category II	Open	348.4	193.6	- 44	82.6	- 76	296.7	- 15
	Limited to authorized users	-	50.5	n/a	65.2	n/a	25.0	n/a
	Limited to authorized users (w/mgmt.)	-	8.1	n/a	-	n/a	-	n/a
	Limited to non-mechanized travel	-	3.1	n/a	-	n/a	7.1	n/a
	Closed	74.7	167.8	125	275.3	269	94.3	26
Sonoran Category III	Open	815.9	490.7	- 40	227.6	- 72	691.2	- 15
	Limited to authorized users	-	36.8	n/a	128.1	n/a	15.6	n/a
	Limited to authorized users (with mgmt.)	-	5.8	n/a	-	n/a	1.8	n/a
	Limited to foot travel	-	0.9	n/a	0.9	n/a	0.9	n/a
	Limited to non-mechanized travel	-	42.9	n/a	9.0	n/a	43.4	n/a
	Limited - seasonal	35.2	-	-100	-	-100	-	-100
	Closed	25.0	299.0	1,098	510.5	1,945	123.2	393
Mojave Category III	Open	23.5	17.1	- 28	12.7	- 46	17.6	- 25
	Limited to authorized users	-	1.8	n/a	3.3	n/a	1.8	n/a
	Closed	0.1	4.8	3,952	7.7	6,382	4.3	3,523

Table 3.9. *Miles of Routes Proximate to (1/4 mile) Tortoise Habitats*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Sonoran Category II	Open	19.9	12.8	-36	5.2	-74	22.1	11
	Limited to authorized users	-	1.7	n/a	0.8	n/a	0.8	n/a
	Closed	13.9	19.4	39	27.9	100	10.9	-21
Sonoran Category III	Open	45.8	24.2	-47	12.5	-73	30.6	-33
	Limited to authorized users	0.3	4.3	1,167	12.2	3,479	3.1	810
	Closed	0.7	18.2	2,550	22.0	3,104	13.1	1,807

	Designation	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
		Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
Mojave Category III	Open	0.7	0.5	-26	0.5	-26	1.0	46
	Limited to authorized users	-	0.5	n/a	0.5	n/a	-	n/a
	Limited to foot travel	-	0.7	n/a	0.7	n/a	0.7	n/a
	Closed	1.7	0.6	-61	0.6	-61	0.7	-60

No Action
This alternative would leave open: 0.6 miles of routes in and 2.4 miles of routes proximate to Northern Mexican Garter Snake Habitat; 0.8 miles of routes in and 6 miles of routes proximate to Southwestern Willow Flycatcher proposed critical habitat; 1.7 miles of routes in and 3.5 miles of routes proximate to Western Yellow-billed Cuckoo habitat; 9.4 miles of routes in Sonoran Desert Tortoise category I habitat; 348.4 miles of routes in and 19.9 miles of routes proximate to Sonoran Desert Tortoise category II habitat; 815.9 miles of routes in and 45.8 miles of routes proximate to Sonoran Desert Tortoise category III habitat; and 23.5 miles of routes in and 0.7 miles of routes proximate to Mojave Desert Tortoise category III habitat. It also does not provide comprehensive route-specific or species-specific management action changes based on consideration of threatened or endangered species or Sonoran Desert Tortoise.

Proposed Action
The Proposed Action would designate: 0.6 miles of open routes in and 2.2 miles of open routes proximate to Northern Mexican Garter Snake Habitat; 0.8 miles of open routes in and 3 miles of open routes proximate to Southwestern Willow Flycatcher proposed critical habitat; 1.8 miles of open routes in and 3 miles of open routes proximate to Western Yellow-billed Cuckoo habitat; 6.4 miles of open routes in Sonoran Desert Tortoise category I habitat; 193.6 miles of open routes in and 12.8 miles of open routes proximate to Sonoran Desert Tortoise category II habitat; 490.7 miles of open routes in and 24.2 miles of open routes proximate to Sonoran Desert Tortoise category III habitat; and 17.1 miles of open routes in and 0.5 miles of open routes proximate to Mohave Desert Tortoise category III habitat.

Resource Protection Alternative
This alternative would designate: 0.4 miles of open routes proximate to Northern Mexican Garter Snake Habitat; 0.2 miles of open routes in and 1 mile of open routes proximate to Southwestern Willow Flycatcher proposed critical habitat; 3 miles of open routes proximate to Western Yellow-billed Cuckoo habitat; 2.4 miles of open routes in Sonoran Desert Tortoise category I habitat; 82.6 miles of open routes in and 5.2 miles of open routes proximate to Sonoran Desert Tortoise category II habitat; 227.6 miles of open routes in and 12.5 miles of open routes proximate to Sonoran Desert Tortoise category III habitat; and 12.7 miles of open routes in and 0.5 miles of open routes proximate to Mohave Desert Tortoise category III habitat.

Access Alternative
This alternative would designate: 0.6 miles of open routes in and 2.2 miles of open routes proximate to Northern Mexican Garter Snake Habitat; 0.8 miles of open routes in and 3.7 miles of open routes proximate to Southwestern Willow Flycatcher proposed critical habitat; 1.8 miles of open routes in and 3 miles of open routes proximate to Western Yellow-billed Cuckoo habitat; 7.6 miles of open routes in Sonoran Desert Tortoise category I habitat; 296.7 miles of open routes in and 22.1 miles of open routes proximate to Sonoran Desert Tortoise category II habitat; 691.2 miles of open routes in and 30.6 miles of open routes proximate to Sonoran Desert Tortoise category III habitat; and 17.6 miles of open routes in and 1 mile of open routes proximate to Mohave Desert Tortoise category III habitat.

3.3.8 Hydrologic Resources, Riparian Zones, and Wetlands

Affected Environment

Hydrology

Surface Water

Perennial surface water flows only in the Colorado River and portions of the Bill Williams River. Alamo Lake, east of the Project Area, stores water delivered by the Big Sandy and Santa Maria Rivers. Key washes that intermittently carry water in the Project Area include Bouse, Centennial, Cunningham, and Standard Wash. The Colorado River flows through LHFO from the Bullhead City/Laughlin area to Parker, Arizona.

About 10 miles of Lake Havasu, from the northern boundary of the Project Area to a point east of Parker Dam, lies within the Project Area. The Colorado River and Lake Havasu support a tremendously diverse and popular recreational program. This year-round program focuses on fishing, water sports, boating, and camping.

The Bill Williams River starts below Alamo Dam in the northeast section of the Project Area, winding 37 canyon miles to the west through a mix of land ownership to Lake Havasu. The river also provides water for riparian areas, wildlife, and wild burros.

Water Quality

Surface Water

The BLM works cooperatively through separate memoranda of understanding under the Clean Water Act authorities of both Arizona Department of Environmental Quality and the California State Water Resources Control Board to manage the Project Area's public lands in a way that minimizes non-point source pollution. The objective of this cooperation is to restore and maintain the chemical, physical, and biological integrity of the Colorado River and tributaries for all users, with emphasis on non-consumptive water uses of productive fish and wildlife habitat, and sa–fe water recreation. To do this BLM must prescribe actions on or near the river to assure designated beneficial uses of the water are not impaired by those actions. A secondary responsibility lies in monitoring aquatic resources, and other actions on the river to safeguard against impairment of this public resource.

The magnitude of recreational boating on the lower Colorado River has increased dramatically over the past several decades. As boating numbers increase, so does potential for water quality degradation through fuel spills, exhaust, solid and human wastes, and wake erosion of shoreline.

Nitrate-enriched groundwater is probably discharging to the lower Colorado River and would continue to do so many years into the future. Nitrates are a fertilizer that would encourage aquatic growth in the river. This growth could become a significant barrier to navigation, water sports, and aesthetics. It can also contribute to depleted dissolved oxygen levels that can kill fish.

The 2016 Status of Water Quality in Arizona 305(b) Assessment Report indicated that the western portion of the Bill Williams River within the Project Area, from Mohave Wash near Planet to the confluence with the Colorado River, was "attaining" for some uses an exceedance for dissolved oxygen, while the eastern portion of the river within the Project Area remained "impaired" with exceedances for ammonia, dissolved oxygen, and high pH (placed on 303(d) list in 2006) (Arizona Department of Environmental Quality 2018).

Riparian/Wetlands

Lentic habitat is associated with standing water such as in Lake Havasu or backwaters associated with a river floodplain. These areas are measured by the acre. "Lotic" habitats are associated with moving water such as the Bill Williams and Colorado Rivers, and these linear areas are measured by miles.

Proper functioning condition (PFC) is the BLM management objective for these scarce, water-oriented resources. PFC is a measure of a riparian-wetland area's ability to withstand disturbance from flooding in flowing water systems or wave action associated with standing water systems. Functional condition is determined through application of a quantitative method that considers the hydrologic, geomorphic, geologic, and vegetative attributes of an area (Bureau of Land Management 1991). To attain PFC for a riparian/wetland area the vegetative, geologic, and hydrologic features of that area must all be functioning in a stable and natural manner that perpetuates water supply through droughts, diminishes flood damages, and optimizes water quality and the biodiversity of the area.

The *LHFO Proposed RMP and Final EIS* identified a total of 56 acres of emergent wetlands, a portion of which are in the Project Area, determined to be in PFC. The wetland habitats are typically dominated by cattail and/or bulrush in both lentic and lotic environments of Lake Havasu or the Colorado River.

The *LHFO Proposed RMP and Final EIS* also identified 38 miles of riverside (lotic), and 96 acres of lakeside (lentic) riparian habitats, portions of which are also in the Project Area, listed in the "Functional at Risk" category. These riparian habitats are populated with a mix of woody native trees and shrubs, including the invasive saltcedar. A dam (Parker Dam for Lake Havasu and the Parker Strip, and Alamo Dam for the Bill Williams River) regulates the water regime for each area. The relatively constant, long-term water supply that has resulted from construction of the dams has eliminated the riparian renewal process of floods. The regulated, constant water levels in the reservoir and controlled flows in the river segments have enabled establishment of exotic plants. This hydrologic modification has interrupted the perpetual erosion and sediment deposition process of free-flowing rivers (Mueller and Marsh 2002) that is critical to achieving PFC. These issues, combined with the fact that BLM has no control over water levels or supply flows, puts these resources in the "Functional at Risk" classification.

Specifically, the downward trend noted on the 96 acres around Lake Havasu, and the 17 miles of Colorado River segments both above and below Lake Havasu is due to an increase in saltcedar and potentially other exotic, less desirable riparian species.

Environmental Consequences

Effects Common to All Alternatives

Direct effects of travel route designations on hydrology, water quality, and riparian wetlands include direct introduction of hydrocarbon pollution to water resources from boats in the Lake Havasu portion of the Project Area, compaction of riparian/wetlands soils from vehicle traffic, trampling and killing of riparian/wetlands vegetation from vehicles or other human-related recreation activities (e.g. shoreline camping, hiking, etc.).

Indirect effects include loss of water transmigration, and drying up of riparian wetland area(s) from soil compaction; soil compaction and loss of vegetation in washes from OHV use, resulting in accelerated erosion and soil deposition in waterways and riparian/wetland areas during flood events; soil compaction and surface erosion from concentrated human access and off-route expanded use (e.g. camping, hiking, etc.) resulting in rilling, gullying, and sediment travel into waterways and riparian/wetlands areas.

Table 3.10 below shows the miles of routes in and proximate to (1/4 mile) the riparian within the Project Area, and their designations under each alternative. Table 3.11 below shows the number of routes leading to and crossing ephemeral and perennial streams and their designations under each alternative.

Table 3.10. *Miles of Routes in and Proximate to Riparian Areas*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**%Δ from No Action**	**Miles**	**%Δ from No Action**	**Miles**	**%Δ from No Action**
In Riparian	Open	3.1	2.9	-8	0.4	-86	2.8	-8
	Limited to authorized users	-	0.1	n/a	2.4	n/a	0.1	n/a
	Limited to non-mechanized travel	-	0.1	n/a	-	n/a	0.1	n/a
	Limited to foot travel	-	0.6	n/a	0.6	n/a	0.6	n/a
	Closed	0.8	0.3	-63	0.5	-42	0.3	-62
Proximate to Riparian (1/4 mi.)	Open	7.4	3.9	-47	1.0	-86	4.3	-41
	Limited seasonally	0.4	-	-100	-	-100	-	-100
	Limited to authorized users	-	0.8	n/a	3.0	n/a	0.3	n/a
	Limited to non-mechanized travel	-	1.3	n/a	0.3	n/a	1.3	n/a
	Limited to foot travel	-	0.1	n/a	0.1	n/a	0.1	n/a
	Closed	1.5	3.2	115	4.8	223	3.2	116

Table 3.11. *Number of Routes Leading to and Crossing Streams*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Number**	**Number**	**%Δ from No Action**	**Number**	**%Δ from No Action**	**Number**	**%Δ from No Action**
Leads to Perennial Stream	Open	2	2	0	-	n/a	2	0
	Limited to authorized users	-	-	n/a	2	n/a	-	n/a
Crosses Ephemeral Stream	Open	5	2	-60	1	-80	5	0
	Limited to authorized users	-	2	n/a	1	n/a	-	n/a
	Closed	-	1	n/a	3	n/a	-	n/a

No Action
This alternative would leave 3.1 miles of routes open in, and 7.4 miles of routes proximate to riparian areas. This alternative would leave two routes leading to perennial streams, and five routes crossing ephemeral streams open. It would not provide route-by-route management action changes based on consideration of water quality, wetlands, or riparian areas.

Proposed Action
The Proposed Action would designate 2.9 miles of open routes in, and 3.9 miles of open routes proximate to riparian areas. An additional 0.1-mile of routes in and 0.8 miles of routes proximate to riparian areas would be limited to authorized users. The Proposed Action would designate two open routes leading to perennial streams, and two open routes crossing ephemeral streams; an additional two routes crossing ephemeral streams would be limited to authorized users.

Resource Protection Alternative
This alternative would designate 0.4 miles of open routes in, and 1 mile of open routes proximate to riparian areas. An additional 2.4 miles of routes in and 1.3 miles of routes proximate to riparian areas would be limited to authorized users. This alternative would designate zero open routes leading to perennial streams, and one open route crossing an ephemeral stream; one additional route crossing an ephemeral stream would be limited to authorized users.

Access Alternative
This alternative would designate 2.8 miles of open routes in, and 4.3 miles of open routes proximate to riparian areas. An additional 0.1-mile of routes in and 0.3 miles of routes proximate to riparian areas would be limited to authorized users. This alternative would designate two open routes leading to perennial streams and five open route crossing an ephemeral stream.

3.3.9 Wild and Scenic Rivers

Affected Environment
The 21 miles of the Bill Williams River from the dam downstream to Planet Ranch contain approximately 16 miles of BLM-administered land. Three segments of the Bill Williams River were analyzed in accordance with the Wild and Scenic Rivers Act (December 23, 1980) and BLM Information Memoranda 87-515 (July 23, 1987) and 88-570 (September 8, 1988) to

Resource Protection Alternative
This alternative would designate no open routes in the area eligible for protection as Scenic, and 0.04 miles of open routes in the area eligible for protection as Wild.

Access Alternative
This alternative would designate 1 mile of open routes in the area eligible for protection as Scenic, and 0.3 miles of open routes in the area eligible for protection as Wild.

3.3.10 BLM Sensitive Species, General Wildlife

Affected Environment

The Project Area sits at the junction of the Mojave and Sonoran Deserts. The interface between these two deserts, together with their unique interior chaparral and riparian vegetation communities, results in a huge diversity of habitat types and wildlife. There are mountains, washes, wetlands and riparian habitats, as well as the Colorado and Bill Williams River systems. These habitats provide a wide range of variability in vegetative species composition, structural components, and food quality and availability, thereby hosting abundant wildlife. More than 800 species of fish, amphibians, birds, reptiles, and mammals occur in this area as year-round residents, seasonal residents, or migrants. The diverse flora and fauna of the Project Area have strong ecological value and attraction for the public. For a list of general wildlife and game species in the Project Area, see Appendix F.

The following BLM sensitive animal species are present in the Project Area and received species-specific consideration during route evaluation:

- Arizona toad (Anaxyrus microscaphus)
- Lowland leopard frog (*Lithobates yavapaiensis*)
- Mojave fringe-toed lizard (*Uma scoparia*)
- Sonoran desert tortoise (*Gopherus morafkai*)[1]
- American peregrine falcon (*Falco peregrinus anatum*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Ferruginous hawk (*Buteo regalis*)
- Gilded flicker (*Colaptes auratus chrysoides*)
- Golden eagle (*Aquila chrysaetos*)
- Le Conte's thrasher (*Toxostoma lecontei*)
- Western burrowing owl (*Athene cunicularia hypugaea*)

See Maps 12-17 in Appendix B for the habitat locations and distribution of some species (where BLM has available data) within the Project Area and associated route network.

The scaly-stemmed sand plant (*Pholisma arenarium*) is the only BLM sensitive plant species recorded during route evaluation. Note: The scaly-stemmed sand plant is considered a special status species, which is a plant or animal species listed as endangered, threatened, candidate or sensitive by federal or state governments.

[1] Potential impacts to Sonoran desert tortoise are discussed with Mojave Desert Tortoise in see Section 3.3.7

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
Gilded Flicker Habitat	Open	31.0	17.4	-44	13.7	-56	28.9	-7
	Closed	-	13.6	n/a	17.3	n/a	2.1	n/a
Golden Eagle Habitat	Open	303.4	205.0	-32	87.9	-71	233.6	-23
	Limited seasonally	20.2	-	-100	-	-100	-	-100
	Limited to authorized users (w/mgmt.)	-	5.3	n/a	-	n/a	1.8	n/a
	Limited to authorized users	-	20.3	n/a	62.3	n/a	18.0	n/a
	Limited to non-mechanized travel	-	24.0	n/a	-	n/a	24.0	n/a
	Limited to foot travel	-	0.9	n/a	0.9	n/a	0.9	n/a
	Closed	2.5	70.7	2,772	175.0	7,006	47.8	1,843
LeConte's Thrasher Habitat	Open	634.6	383.6	-40	195.8	-69	531.9	-16
	Limited seasonally	2.4	-	-100	-	-100	-	-100
	Limited to authorized users (w/mgmt.)	-	24.4	n/a	-	n/a	16.4	n/a
	Limited to authorized users	3.6	40.6	1,037	110.4	2,991	26.6	645
	Closed	172.5	364.4	111	506.8	194	238.1	38
Western Burrowing Owl Habitat	Open	2.0	1.0	-50	1.0	-50	1.0	-50
	Closed	-	1.0	n/a	1.0	n/a	1.0	n/a

Table 3.14 below shows miles of routes in scaly-stemmed sand plant habitat and the designations of those routes in each alternative.

Table 3.14. *Mileage in Scaly-stemmed Sand Plant Habitat*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
Open	180.6	123.2	-32	41.2	-77	129.1	-28
Limited to authorized users (w/mgmt.)	-	3.8	n/a	-	n/a	-	n/a
Limited to authorized users	7.1	13.0	82	58.1	714	13.0	82
Closed	7.8	55.5	613	96.2	1,136	53.4	586

Table 3.15 below shows miles of routes in wildlife corridors and the designations of those routes in each alternative.

Table 3.15. *Miles of Routes in Wildlife Corridors*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Open	384.4	241.7	-37	108.1	-72	341.5	-11
Limited to authorized users	-	15.1	n/a	46.7	n/a	4.2	n/a
Limited to authorized users (w/mgmt.)	-	2.2	n/a	-	n/a	-	n/a
Limited to non-mechanized use	-	28.2	n/a	6.7	n/a	32.8	n/a
Limited - seasonal	23.4	-	-100	-	-100	-	-100
Closed	17.5	138.0	690	263.8	1,411	46.8	168

Table 3.16 below shows miles of routes in and proximate to desert bighorn sheep habitat and the designations of those routes in each alternative.

Table 3.16. *Miles of Routes in and Proximate to Desert Bighorn Sheep Habitat*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
In Sensitive Habitat	Open	41.7	49.1	18	31.6	- 24	63.2	51
	Limited - seasonal	29.1	-	-100	-	-100	-	-100
	Limited to authorized users	-	5.2	n/a	7.4	n/a	0.8	n/a
	Limited to non-mechanized travel	-	3.8	n/a	1.3	n/a	4.1	n/a
	Closed	3.5	16.2	360	34.1	865	6.4	80
Proximate to Sensitive Habitat (1/4 mile)	Open	3.0	1.5	- 51	0.3	- 91	1.5	- 49
	Limited to authorized users	-	-	n/a	0.4	n/a	-	n/a
	Limited to authorized users (w/mgmt.)	-	-	n/a	-	n/a	-	n/a
	Limited to non-mechanized travel	-	0.2	n/a	0.2	n/a	0.9	n/a
	Closed	-	1.3	n/a	2.1	n/a	0.6	n/a
In Dispersed Habitat	Open	517.7	325.4	- 37	160.3	- 69	455.4	- 12
	Limited to authorized users	-	44.9	n/a	81.6	n/a	25.4	n/a
	Limited to authorized users (w/mgmt.)	-	8.6	n/a	-	n/a	0.6	n/a
	Limited to foot travel	-	0.5	n/a	0.5	n/a	0.5	n/a

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
	Limited to non-mechanized travel	-	22.2	n/a	0.01	n/a	23.9	n/a
	Limited - seasonal	6.0	-	-100	-	-100	-	-100
	Closed	69.6	191.6	175	351.0	404	87.5	26
Proximate to Dispersed Habitat (1/4 mile)	Open	175.4	96.0	- 45	32.5	- 81	140.2	- 20
	Limited to authorized users	-	10.1	n/a	24.2	n/a	5.5	n/a
	Limited to authorized users (w/mgmt.)	-	3.6	n/a	-	n/a	1.1	n/a
	Limited to foot travel	-	1.0	n/a	1.0	n/a	1.0	n/a
	Limited to non-mechanized travel	-	5.5	n/a	0.4	n/a	7.3	n/a
	Closed	20.2	79.4	293	137.5	580	40.5	100

Table 3.17 below shows the number of routes providing access to developed wildlife water (drinkers) and the designations of those routes in each alternative.

Table 3.17. *Routes Providing Access to Developed Wildlife Water*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	Number	Number	%Δ from No Action	Number	%Δ from No Action	Number	%Δ from No Action
Open	13	8	-38	5	-62	15	15
Limited seasonally	3	-	-100		-100	-	-100
Limited to authorized users	-	8	n/a	10	n/a	1	n/a
Limited to non-mechanized travel	-	2	n/a	2	n/a	2	n/a
Closed	2	-	-100	1	-50	-	-100

No Action

This alternative would leave open 3.5 miles of routes in Arizona toad habitat; 214.9 miles of routes in lowland leopard frog habitat; 203.8 miles of routes in Mohave fringe-toed lizard habitat; 896.8 miles of routes in American peregrine falcon habitat; 427.3 miles of routes in bald eagle habitat; 18.6 miles of routes in ferruginous hawk habitat; 31 miles of routes in gilded flicker habitat; 303.4 miles of routes in golden eagle habitat; 634.6 miles of routes in LeConte's thrasher habitat; 2 miles of routes in western burrowing owl habitat; 180.6 miles of routes in scaly-stemmed sand plant habitat; 384.4 miles of routes in wildlife corridors; 41.7 miles of routes in and 3 miles of routes proximate to sensitive bighorn sheep habitat; 517.7 miles of routes in and 175.4 miles of routes proximate to dispersed bighorn sheep habitat; and 13 routes providing

access to developed wildlife water. An additional three routes providing access to developed wildlife water would be limited seasonally.

Proposed Action
The Proposed Action would designate 2.9 miles of open routes in Arizona toad habitat; 98.1 miles of open routes in lowland leopard frog habitat; 132 miles of open routes in Mohave fringe-toed lizard habitat; 557.2 miles of open routes in American peregrine falcon habitat; 265.6 miles of open routes in bald eagle habitat; 13.2 miles of open routes in ferruginous hawk habitat; 17.4 miles of open routes in gilded flicker habitat; 205 miles of open routes in golden eagle habitat; 383.6 miles of open routes in LeConte's thrasher habitat; 1 mile of open routes in western burrowing owl habitat; 123.2 miles of open routes in scaly-stemmed sand plant habitat; 241.7 miles of open routes in wildlife corridors; 49.1 miles of open routes in and 1.5 miles of open routes proximate to sensitive bighorn sheep habitat; 325.4 miles of open routes in and 96 miles of open routes proximate to dispersed bighorn sheep habitat; and 8 open routes providing access to developed wildlife water.

Resource Protection Alternative
This alternative would designate 1.1 miles of open routes in Arizona toad habitat; 36.5 miles of open routes in lowland leopard frog habitat; 41.7 miles of open routes in Mohave fringe-toed lizard habitat; 232.1 miles of open routes in American peregrine falcon habitat; 119.4 miles of open routes in bald eagle habitat; 13.2 miles of open routes in ferruginous hawk habitat; 13.7 miles of open routes in gilded flicker habitat; 87.9 miles of open routes in golden eagle habitat; 195.8 miles of open routes in LeConte's thrasher habitat; 1 mile of open routes in western burrowing owl habitat; 41.2 miles of open routes in scaly-stemmed sand plant habitat; 108.1 miles of open routes in wildlife corridors; 31.6 miles of open routes in and 0.3 miles of open routes proximate to sensitive bighorn sheep habitat; 160.3 miles of open routes in and 32.5 miles of open routes proximate to dispersed bighorn sheep habitat; and 5 open routes providing access to developed wildlife water.

Access Alternative
This alternative would designate 2.9 miles of open routes in Arizona toad habitat; 162.2 miles of open routes in lowland leopard frog habitat; 141.8 miles of open routes in Mohave fringe-toed lizard habitat; 748.9 miles of open routes in American peregrine falcon habitat; 325.7 miles of open routes in bald eagle habitat; 15.3 miles of open routes in ferruginous hawk habitat; 28.9 miles of open routes in gilded flicker habitat; 233.6 miles of open routes in golden eagle habitat; 531.9 miles of open routes in LeConte's thrasher habitat; 1 mile of open routes in western burrowing owl habitat; 129.1 miles of open routes in scaly-stemmed sand plant habitat; 341.5 miles of open routes in wildlife corridors; 63.2 miles of open routes in and 1.5 miles of open routes proximate to sensitive bighorn sheep habitat; 455.4 miles of open routes in and 140.2 miles of open routes proximate to dispersed bighorn sheep habitat; and 15 open routes providing access to developed wildlife water.

3.3.11 Wilderness, Wilderness Study Areas, Lands with Wilderness Characteristics

Affected Environment
The East Cactus Plain, Gibraltar Mountain, and Swansea Wildernesses are located entirely within the Project Area. The Cactus Plain wilderness study area (WSA) is located entirely within

the Project Area. Additionally, there are 31,276 acres of Land with Wilderness Characteristics (LWC) within the Project Area (see Maps 10 and 11 in Appendix B).

Environmental Consequences

During evaluation, approximately 1.5 miles of routes were identified in the Swansea Wilderness. These routes would be closed under all alternatives, including No Action. During evaluation, approximately 6.2 miles of routes were identified in the Cactus Plain WSA. These routes would be limited to authorized users only under the No Action alternative and were closed in all three action alternatives. Table 3.18 below shows the miles of routes in LWC and their designations under each alternative.

Table 3.18. *Miles of routes in Lands with Wilderness Characteristics*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Open	47.9	-	-100	-	-100	-	-100
Limited to non-mechanized	5.3	46.0	767.9	9.0	69.8	50.5	852.8
Closed	-	7.2	n/a	44.2	n/a	2.7	n/a

Under current management, there are 47.9 miles of routes open in LWC within the plan area. All three-action alternatives would limit those routes to non-mechanized uses or close them.

3.3.12 Livestock Grazing

Affected Environment

All or portions of six LHFO managed grazing allotments are within the Project Area, including three allotments that cross or are fully within the LHFO boundary, but are managed by the Yuma Field Office (YFO), those are the Calhoun, Weisser, and Crowder-Weisser allotments (See Maps 18 and 19 in Appendix B). Table 3.19 below shows the allotments in the Project Area and their size.

Table 3.19. *Allotments in Project Area*

Allotment	Acres in Project Area	Total Allotment Acres
Planet	282,302	509,667
Primrose	131,764	268,843
Ganado	244,708	244,708
Muse	342,242	362,535
Hancock	4	173,541
Nine Mile	296,928	363,017
Calhoun	37,143	56,788
Crowder-Weisser	156,268	320,521
Weisser	5,969	67,940

Range improvement work has taken place in the Project Areas to improve the effectiveness of livestock grazing. Fences, except where natural barriers effectively control livestock, define allotment boundaries. Interior fences, which form pastures, further divide the allotments and help

control livestock movement. Numerous springs, wells, dirt tanks, and rain catchments have been developed to provide water for livestock and wildlife.

Environmental Consequences

Effects Common to All Alternatives

Use of routes at a high enough level (i.e. sufficient that the route is not reclaiming) causes compaction, which limits or prevents growth of vegetation (forage). Thus, alternatives with a greater mileage of routes open for vehicle use in allotments may somewhat reduce productivity. Access to range improvements, however, is vital to the continued viability of livestock grazing. Table 3.20 below shows the miles of routes in allotments and their designations under each alternative. Table 3.21 below shows the number of routes providing access to range improvements and their designations under each alternative.

Table 3.20. *Miles of Routes in Allotments*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Miles**	**Miles**	**%Δ from No Action**	**Miles**	**%Δ from No Action**	**Miles**	**%Δ from No Action**
Open	1,228.4	736.6	-40	316.9	-74	1,013.2	-18
Limited seasonally	35.2	-		-		-	
Limited to authorized users (w/mgmt.)	-	28.0		-		18.2	
Limited to authorized users	7.1	76.3	970	241.6	3,288	46.6	553
Limited to non-mechanized travel	-	41.0		8.5		45.6	
Limited to foot travel	-	1.6		1.6		1.6	
Closed	102.4	489.7	378	804.5	685	248.0	142

Table 3.21*. Number of Routes Providing Access to Range Improvements*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Number**	**Number**	**%Δ from No Action**	**Number**	**%Δ from No Action**	**Number**	**%Δ from No Action**
Access to Developed Water	Open	5	2	-60.0	-	-100	6	20.0
	Limited to authorized users	-	1	n/a	3	n/a	-	n/a
	Closed	1	3	200.0	2	100.0	-	-100
Access to Corral	Open	9	7	-22.2	3	-66.7	10	11.1
	Limited to authorized users	-	2	n/a	4	n/a	-	n/a
	Closed	3	3	0.0	5	66.7	2	-33.3
	Open	5	4	-20.0	2	-60.0	6	20.0

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	Number	Number	%Δ from No Action	Number	%Δ from No Action	Number	%Δ from No Action
Access to Tank/ Trough	Limited to authorized users	-	2	n/a	5	n/a	1	n/a
	Closed	4	2	-50.0	2	-50.0	2	-50.0

No Action
This alternative would leave 1,228.4 miles of routes open in grazing allotments in the Project Area. An additional 35.2 miles of routes in grazing allotments in the Project Area would be limited seasonally, and 7.1 miles of routes in grazing allotments in the Project Area would be limited to authorized users. This alternative would leave open: five routes providing access to developed water, 9 routes providing access to corrals, and 5 routes providing access to a water tank and/or trough. It would not provide route-by-route management action changes based on consideration of grazing activity or improvements.

Proposed Action
The Proposed Action would designate 736.6 miles of open routes in grazing allotments in the Project Area. An additional 104.3 miles of routes in grazing allotments in the Project Area would be limited to authorized users. The Proposed Action would designate two open routes providing access to developed water; one additional route providing access to developed water would be limited to authorized users. The Proposed Action would designate seven open routes providing access to corrals; an additional two routes providing access to corrals would be limited to authorized users. The Proposed Action would designate four open routes providing access to a water tank and/or trough; an additional two routes providing access to a water tank and/or trough would be limited to authorized users.

Resource Protection Alternative
This alternative would designate 316.9 miles of open routes in grazing allotments in the Project Area. An additional 241.6 miles of routes in grazing allotments in the Project Area would be limited to authorized users. This alternative would designate no open routes providing access to developed water; three routes providing access to developed water would be limited to authorized users. This alternative would designate three open routes providing access to corrals; an additional four routes providing access to corrals would be limited to authorized users. This alternative would designate two open routes providing access to a water tank and/or trough; an additional five routes providing access to a water tank and/or trough would be limited to authorized users.

Access Alternative
This alternative would designate 1,013.2 miles of open routes in grazing allotments in the Project Area. An additional 64.8 miles of routes in grazing allotments in the Project Area would be limited to authorized users. This alternative would designate six open routes providing access to developed water. This alternative would designate 10 open routes providing access to corrals. This alternative would designate six open routes providing access to a water tank and/or trough;

one additional route providing access to a water tank and/or trough would be limited to authorized users.

3.3.13 Recreation

Affected Environment

According to *LHFO Proposed RMP and Final EIS*: "Travel Management is linked closely with recreation. Public access to the lands is in itself recreational experience in all its diverse expressions, which include OHV activity, equestrian exploration, and hiking experiences" (BLM Lake Havasu Field Office 2006). Over 80 recreation-related sites exist in the Project Area and include day use areas, campgrounds, Lake Havasu shoreline camps, resorts, lodges, boat launches, fishing docks, and interpretive displays. The Project Area provides a variety of recreation opportunities and contains formally classified recreation settings, an extensive recreation management area, special recreation management areas, special recreation management zones, OHV open areas, backcountry byways, the Parker 400 racing event and portions of the proposed Peace Trail also occur in the Project Area. The Project Area is a popular vacation destination, and its proximity to Phoenix, Las Vegas, and southern California has dramatically increased recreation visits. As of 2006, about 660,000 people visited Lake Havasu itself annually. Day users from nearby communities likely represent the Project Area's fastest growing user group. The Project Area has winter and summer recreation seasons, each with their own trends. See pages 3-80 through 3-81 of the *LHFO Proposed RMP and Final EIS* for more details on recreation in the LHFO.

Recreation Settings

All Project Area BLM and BR lands fall into five-recreation opportunity spectrum (ROS) setting classes. See Table 3.22 for details. As described in the *LHFO RMP*, the ROS "is a planning tool that provides a framework to inventory or assess existing recreation opportunities/conditions" (BLM Lake Havasu Field Office 2007). The vast majority of the network is in the Semi-Primitive and Rural Natural ROS classes. For more details on the ROS and its classes, see Appendix I in the LHFO RMP.

Table 3.22. *Project Area Recreation Setting Classes (acreages and mileages are approximate)*

Recreation Setting Class	Management Summary	Project Area BLM/BOR Acreage	Network Miles in Each Class
Semi-Primitive (S)	Allows for high degree of interaction with the natural environment.	226,171	847.0
Rural Natural (N)	Harmonize with the natural environment, while protecting public safety and resources is subtle	192,441	1,047.3
Primitive (P)	Ensure the opportunities for unconfined recreation, solitude and the untrammeled landscapes.	159,466	89.1
Rural Developed (D)	Provides for user convenience as well as for safety and resource protection.	16,030	78.0
Suburban (B)	Provides for moderate to high use in designing recreational opportunities.	6,308	5.6

Lake Havasu Field Office Extensive Recreation Management Area (ERMA)
Approximately 417,893 acres of BLM and BOR land and 1,320 network miles (64% of total network) are in this ERMA. The LHFO ERMA covers lands in the Project Area that are not within the SRMAs, and it includes the Cactus Plain WSA, the East Cactus Plain Wilderness, and the Swansea Wilderness. The management prescriptions for this ERMA are found on page 96 of the RMP.

Special Recreation Management Areas (SRMAs)
Five SRMAs exist in the Project Area as shown on Maps 20 and 21 in Appendix B. Table 3.23 provides acreages and mileages for the SRMAs. The *LHFO RMP* says that SRMAs "are areas where the BLM focuses specific management, funding, and planning to provide for the best possible recreation experience while protecting, sustaining, and enhancing the environmental resources of these areas. A framework for each SRMA's activity plan can be found in Appendix B under Administrative Actions" (BLM Lake Havasu Field Office 2007). For the SRMA-specific management prescriptions, see pages 47- 102 of the LHFO RMP.

Table 3.23 *Project Area SRMAs (acreages and mileages are approximate)*

SRMA Name	Further Details in *LHFO RMP* (BLM 2007)	Project Area BLM/BOR Acreage	Network Miles in SRMA
Plomosa	Map 25 and Table 7g	101,976	540.2
Gibraltar	Map 23 and Table 7e	50,644	160.5
Lake Havasu	Map 22 and Table 7b	14,339	18.1
Parker Strip	Map 21 and Table 7c	12,062	7.8
Swansea	Map 21 and Table 7d	3,837	29.5

Special Recreation Management Zones (RMZs)
Each SRMA listed in Table 3.24 contains multiple RMZs. See Appendix G for more details on each RMZ as well as Maps 21, 22, 23, and 25 and Tables 7b-7e and 7g in the *LHFO RMP*. Not all RMZs in the Project Area contain routes, including the dispersed camping area along Plomosa Road, which, corresponds with the Back Country Byway RMZ (See Map 22 in Appendix B).

OHV Open Areas
There are three OHV open areas within the Project Area. These areas were designated in the LHFO RMP, see pages 111-113 and Map 31 the *LHFO RMP* for more information.

Back Country Byways
The Project Area hosts approximately 11.1 miles of the Parker Dam Road Back Country Byway (aka Parker Strip Back Country Byway). Additionally, the Project Area features approximately 42.3 miles of the nominated Parker-Bouse Swansea Back Country Byway and approximately 26.5 miles of the nominated Plomosa Back Country Byway in its route network. See pages 109-110 and Map 28 in the LHFO RMP for more information.

Parker 400 Race
In the Project Area, "there is one designated racecourse for the Parker 400 event, which is open to competitive commercial OHV race events December 1 through February 28 each year" (BLM

Lake Havasu Field Office 2006). See Map 26 in the *LHFO RMP* for a depiction of the racecourse. Approximately 90 miles of this course are within the route network.

Proposed Arizona Peace Trail
The Proposed Arizona Peace Trail is a proposed OHV trail that passes through the Project Area and is intended to connect Bullhead City and Kingman in the north to Yuma in the south. The BLM is evaluating this proposed trail, and the majority of routes that would compose it in the Project Area are designated as open. The Proposed Arizona Peace Trail is a prominent recreation subject in the Project Area. It has a non-profit organization (Arizona Peace Trail, Inc.) working toward its establishment. According to the organization's website, it "has over 40 contributing members from… 14 OHV clubs plus nearly 100 other individuals from other OHV organizations as well as federal, state and local government agencies as supporters" (Arizona Peace Trail 2017).

Environmental Consequences
Effects Common to All Alternatives
General
The LHFO Proposed RMP Final EIS summarizes possible impacts of travel route designation on recreation:

> Impacts on recreation from travel management are those that would occur though the designation of routes and areas as either open closed or limited. As part of this designation process routes would be evaluated. Included in this evaluation process would be the recreational value of the route. This therefore has the opportunity to improve recreation resources and opportunities; however, in areas where other resources take precedence over that of recreation, routes could be closed or limited, thus reducing the overall network of routes and opportunities for exploration.
>
> Any alternative that seeks to open or develop new routes—whether OHV, hiking, mountain biking, or equestrian—has the potential to improve recreational resources and opportunities. (BLM Lake Havasu Field Office 2006)

Additionally, the plan states that "recreation management [which could be implemented via travel route designations] that seeks to promote and enhance travel management by providing interpretive media (e.g. maps and information) improves travel management, and increases public awareness of resources, public safety concerns, and "tread lightly" ethics by educating the public" (BLM Lake Havasu Field Office 2006).

Travel route designations' impacts on recreation would involve reduced, lost, or gained access for recreation opportunities and experiences as well as conflicts with other travel route users seeking different experiences (e.g. equestrian users on open motorized routes encountering dirt bike users). Impacts may also involve route designations not consistent with the SRMAs or the RMZs found in the Project Area.

Because recreation may occur across the Project Area, you may wish to consult Table 3.28 in section 3.3.16, which shows Project Area-wide designation mileages under different alternatives. The discussion in section "3.4.12 Socioeconomics" is also tied to recreation.

Back Country Byways

All routes in the Parker-Bouse Swansea and Plomosa nominated back country byways are designated as open. Table 3.24 below shows the miles of routes within SRMAs and their designations under each alternative.

Table 3.23. *Network of Miles within the Project Area SRMAs*

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Plomosa	Open	297.8	178.0	-40	98.0	-67	311.4	5
	Limited to authorized users	-	55.3	n/a	63.1	n/a	27.3	n/a
	Limited to authorized users (w/mgmt.)	-	20.4	n/a	-	n/a	16.2	n/a
	Closed	242.4	286.5	18	379.1	56	185.4	-24
Gibraltar	Open	128.8	108.6	-16	46.2	-64	159.4	24
	Limited to authorized users	-	8.7	n/a	32.4	n/a	0.0	n/a
	Limited to authorized users (w/mgmt.)	-	1.4	n/a	-	n/a	-	n/a
	Limited - seasonal	8.0	-	-100	-	-100	-	-100
	Closed	23.6	41.8	77	81.9	246	1.1	-95
Lake Havasu	Open	17.3	15.3	-12	11.9	-31	16.6	-4
	Limited to authorized users	-	0.9	n/a	2.4	n/a	-	n/a
	Closed	0.9	2.0	133	3.8	350	1.5	75
Parker Strip	Open	6.4	1.5	-77	0.5	-92	1.8	-72
	Limited to authorized users	-	2.1	n/a	2.1	n/a	1.8	n/a
	Limited to foot travel	-	0.7	n/a	0.7	n/a	0.7	n/a
	Closed	1.3	3.5	160	4.5	237	3.5	162
Swansea	Open	29.0	17.4	-40	3.7	-87	18.8	-35
	Limited to authorized users	-	-	n/a	8.6	n/a	-	n/a
	Limited to authorized users (w/mgmt.)	-	1.8	n/a	-	n/a	1.8	n/a
	Limited to foot travel	-	0.9	n/a	0.9	n/a	0.9	n/a
	Closed	0.5	9.4	1,874	16.4	3,325	8.1	1,588

No Action

The No Action alternative would leave 1,702 miles of routes open across the Project Area. An additional 35.2 miles of routes would be limited seasonally. The No Action alternative would leave open: 297.8 miles of routes open in the Plomosa SRMA; 128.8 miles of routes in the

Gibraltar SRMA; 17.3 miles of routes in the Lake Havasu SRMA within the Project Area; 6.4 miles of routes in the Parker Strip SRMA; and 29.0 miles of routes in the Swansea SRMA. It would not provide route-by-route management action changes based on consideration of recreation activity or special designations, outside that provided by the Gibraltar Management Plan and Parker Strip Recreation Management Plan. Under the No Action alternative, routes would not be numbered or signed, and maps of the route network would not be produced.

Proposed Action
The Proposed Action would designate 991 miles of open routes across the Project Area. An additional 34.6 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 46 miles of routes would be limited to non-mechanized modes of travel. The Proposed Action would designate 178 miles of open routes in the Plomosa SRMA; an additional 20.4 miles of routes would be limited to authorized users with management, and could be opened to the public in the future. The Proposed Action would designate 108.6 miles of open routes in the Gibraltar SRMA; an additional 1.4 miles of routes would be limited to authorized users with management, and could be opened to the public in the future. The Proposed Action would designate 15.3 miles of open routes in the Lake Havasu SRMA within the Project Area. The Proposed Action would designate 1.5 miles of open routes in the Parker Strip SRMA; an additional 0.7 miles of routes would be limited to foot travel. The Proposed Action would designate 17.4 miles of open routes in the Swansea SRMA; an additional 1.8 miles of routes would be limited to authorized users with management, and could be opened to the public in the future, and an additional 0.9 miles of routes would be limited to foot travel.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes across the Project Area. An additional 1.6 miles of routes would be limited to foot travel only, and 9 miles of routes would be limited to non-mechanized modes of travel. This alternative would designate: 98 miles of open routes in the Plomosa SRMA; 46.2 miles of open routes in the Gibraltar SRMA; 11.9 miles of open routes in the Lake Havasu SRMA within the Project Area; 0.5 miles of open routes in the Parker Strip SRMA, with an additional 0.7 miles of routes in the Parker Strip SRMA limited to foot travel. The Proposed Action would designate 3.7 miles of open routes in the Swansea SRMA; an additional 0.9 miles of routes would be limited to foot travel.

Access Alternative
This alternative would designate 1,417.7 miles of open routes across the Project Area. An additional 18.2 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 50.5 miles of routes would be limited to non-mechanized modes of travel. This alternative would designate 311.4 miles of open routes in the Plomosa SRMA; an additional 16.2 miles of routes would be limited to authorized users with management, and could be opened to the public in the future. The Proposed Action would designate 159.4 miles of open routes in the Gibraltar SRMA. The Proposed Action would designate 16.6 miles of open routes in the Lake Havasu SRMA within the Project Area. The Proposed Action would designate 1.8 miles of open routes in the Parker Strip SRMA; an additional 0.7 miles of routes would be limited to foot travel. The Proposed Action would

designate 18.8 miles of open routes in the Swansea SRMA; an additional 1.8 miles of routes would be limited to authorized users with management, and could be opened to the public in the future, and an additional 0.9 miles of routes would be limited to foot travel.

3.3.14 Socioeconomics

Affected Environment

The Project Area is primarily located in La Paz County and Mohave Counties in Arizona with its northwestern portion spilling into San Bernardino County, California. These three counties constitute the primary geographic scope of socioeconomic analysis. San Bernardino County has a much larger population than the other counties. However, the vast majority of its population is located closer to Los Angeles, far from the Project Area. Only small communities exist in the California portion of the Project Area. Nonetheless, San Bernardino County's large population engages in Project Area visits. As stated in the *LHFO Proposed RMP and Final EIS*, "The area of residence of at least 70% of the summer visitors to the BLM lands in the [LHFO] planning area is San Bernardino and Riverside, (California) Counties." (BLM Lake Havasu Field Office 2006).

Population

Tables 3.25 and 3.26 shows Project Area population estimates from the US Census Bureau. In recent years, population has been increasing in Mohave and San Bernardino Counties, though it has slightly decreased in La Paz County. Mohave County's population has been increasing more slowly than Arizona's, and San Bernardino County's population has been increasing at nearly the same rate as California. Of the four major communities in the Project Area, Cienega Springs's population has stayed about the same, but the populations of the other communities (Bouse, Brenda, and Parker Strip) have substantially declined (U. S. Census Bureau 2018). These low population levels contribute to the rural nature of most of the study area, which is characterized by large expanses of open space and undeveloped landscapes and provides numerous recreational opportunities. Winter visitors are major contributors to the local economies in the area and the retail trade and services sectors benefit the most from these visitors between October and March (Arizona Office of Tourism, n.d.).

Table 3.24. *Project Area County and State Population from 2010 and 2016*

Area	2010	2016	Change
La Paz County, AZ	20,489	20,304	-0.9%
Mohave County, AZ	200,186	203,629	1.7%
San Bernardino County, CA	2,035,210	2,106,754	3.4%
Arizona	6,392,017	6,728,577	5.0%
California	37,253,956	38,654,206	3.6%

Source: 2010 estimates from 2010 Census; 2016 estimates from American Community Survey (USCB 2018)

Table 3.25*. Populations of Major Communities in Project Area from 2010 and 2016*

Community	2010	2016	Change
Cienega Springs	1,798	1,795	-0.2%
Bouse	996	765	-23.2%
Brenda	676	349	-48.4%
Parker Strip	662	624	-5.7%

Source: 2010 estimates from 2010 Census; 2016 estimates from American Community Survey (USCB 2018)

Economics

Based on 2016 estimates, service jobs (education, healthcare, retail, recreation, food and accommodation, science, etc.) provide major employment in all Project Area counties and states. Grazing, mining, and recreation in the Project Area are dependent to some extent upon public lands (and waters) and access to these resources. The primary economic drivers in the study area are the arts, entertainment, recreation, accommodation and food service industries (U. S. Census Bureau 2018). These areas in the TMA provide a wide variety of recreational opportunities from boating and fishing on the Colorado River to hiking, OHV travel and exploration of the desert mountain range landscape. The public lands administered by the BLM provide many of the recreational and tourism opportunities in the study area.

From 2010 to 2016, in all Project Area Counties and states, the service sector that includes recreation grew (U. S. Census Bureau 2018). Recreation services play a role in the Project Area's economy, and the Project Area contains many recreation attractions.

Non-market Values

One of the BLM's greatest management challenges is providing reasonable and varied transportation routes for access to public lands and providing areas for a wide variety of both motorized and non-motorized recreational activities. The increasing numbers of users and popularity of OHVs for a variety of purposes have generated increased social conflicts and resource impacts on public lands related to motorized recreation and the impact on other recreation activities and resource uses.

In a 2003 study of OHV use by AZ State Parks, OHV recreation contributed $49.7 million annually to the La Paz County economy, including $24.6 million in OHV-related retail sales and $19.5 million dollars in trip expenditures for OHV recreation. This economic activity supported 459 jobs resulting in approximately $8.3 million in household income for county residents and generated $1.9 million in state tax revenues (Arizona State Parks 2003). The study only considered AZ state residents' economic contributions. Additionally, a 2002 AZ State University study estimated $182,208,613 were spent on OHV-related expenditure in Mohave County. Table 3.27 below is adapted from that study's data, and shows OHV recreation days with origin counties for both La Paz and Mohave Counties (Silberman 2002).

Table 3.26. *OHV Activity Days (adapted from Silberman 2002)*

Activity Days			
Mohave County		**La Paz County**	
Traveling from Origin County	**OHV Days**	**Traveling from Origin County**	**OHV Days**
Apache	2,055	Apache	*
Cochise	2,701	Cochise	810
Coconino	12,211	Coconino	3,213
Gila	2,552	Gila	*
Graham	521	Graham	116
Greenlee	*	Greenlee	*
La Paz	984	Maricopa	50,527

Activity Days			
Mohave County		**La Paz County**	
Traveling from Origin County	**OHV Days**	**Traveling from Origin County**	**OHV Days**
Maricopa	85,508	Mohave	49,687
Navajo	3,481	Navajo	497
Pima	10,894	Pima	21,062
Pinal	*	Pinal	4,220
Santa Cruz	*	Santa Cruz	*
Yavapai	45,230	Yavapai	591
Yuma	9,709	Yuma	22,507
Total	175,846	Total	153,230

* not available due to small sample size

For more details on the Arizona OHV study, see *The Economic Importance of Off-Highway Vehicle Recreation: Economic data on off-highway vehicle recreation for the state of Arizona and for each Arizona County* (Silberman 2002).

A majority of the Project Area's off-highway vehicle users are assumed to be out-of-state winter visitors. Therefore, these economic impacts from OHV recreation in the Project Area were likely understated in the 2003 study (The Economic Importance of Off Highway Vehicle Recreation to Arizona., Arizona State Parks, 2003). Anecdotal evidence and annual observations by BLM employees indicate that off-highway vehicle use is increasing on the public lands in general, and is observed to be a major recreational activity in the TMA.

It is useful to differentiate off-highway vehicle use as its own recreational activity, and OHV use that is incidental to pursuit of other recreational activities. There is a substantial OHV user segment that enjoys riding OHV as a recreational pursuit in and of itself, often enjoyed on particularly steep, rough, or open courses where users can test the capabilities of themselves and their machines.

OHVs are used also commonly used as transportation when pursuing other recreational activities on the public lands. The foregoing analysis of recreational activities in this EA notes that scenic and cultural viewing opportunities, rock-hounding, hiking, mountain biking, equestrian use, and wildlife viewing are also preferred recreational activities in the study area. The quality of many of these recreational activities depends on cultural and natural resources that are not damaged, defaced, or depleted by overuse or inappropriate uses.

The value perceived by users and visitors is difficult to quantify, and yet is a real and important part of why people visit and use the public lands in the study area. These kinds of values are generally referred to as "non-market values". The BLM considers non-market values to be the benefits individuals attribute to experiences of the environment, uses of natural resources, or the existence of particular ecological conditions that do not involve market transactions, and therefore lack prices. Examples include the perceived benefits from hiking in a wilderness, fishing for subsistence rather than commercial purposes, and appreciating the scenic values of

undisturbed landscapes and vistas. People who value natural areas for any reasons are realizing the benefit of a non-market value.

One of the objectives of this TMP is maintaining and improving the condition of many of the cultural and natural resources qualities of the study area. Avoiding and/or mitigating further disturbance along the existing route network and establishing a travel management plan to maintain resource conditions would sustain and possibly enhance visitor and user experiences on the public lands. For example, closure of some ephemeral routes might reduce erosion, allowing vegetation to re-establish more quickly, which in turn would provide more appealing landscapes for viewing and camping, as well as potentially increasing wildlife habitat, leading to more wildlife viewing and/or hunting opportunities.

Environmental Consequences

Resource-Specific Effects Common to All Action Alternatives

Socioeconomics throughout the Project Area may be impacted by travel route designations. Therefore, for context on this discussion, see Table 3.28 in section 3.3.16, which shows alternative mileages and designations for the entire Project Area. By establishing a clearly defined travel network in the Project Area with maps, signing, increased education, etc., the action alternatives and their travel route designations may strengthen the recreation-related service sectors of the Project Area's economy by making it easier for visitors to utilize routes and recreate on BLM-administered lands through travel. The formal network would also make it easier for local communities to market route and trail systems to benefit both visitors and new long-term residents. The action alternatives' careful consideration and balance of motorized access with the protection of biological and cultural resources may also make the Project Area more appealing for visitors who value natural landscapes and improving the quality of their experiences. Additionally, by designating various routes as limited to authorized users (including miners, ranchers, etc.), the action alternatives may help maintain the agriculture and resource extraction-related aspects of the local economy. Some travel route designations may also contribute to increasing or reducing user conflict and social disruptions, which could involve undesirable speed and noise impacts.

No Action

The No Action alternative would leave 1,702 miles of routes open across the Project Area. An additional 35.2 miles of routes would be limited seasonally. Under the No Action alternative, routes would not be numbered or signed, and maps of the route network would not be produced.

Proposed Action

The Proposed Action would designate 991 miles of open routes across the Project Area. An additional 34.6 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 46 miles of routes would be limited to non-mechanized modes of travel.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes across the Project Area. An additional 1.6 miles of routes would be limited to foot travel only, and 9 miles of routes would be limited to non-mechanized modes of travel.

Access Alternative
This alternative would designate 1,417.7 miles of open routes across the Project Area. An additional 18.2 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 50.5 miles of routes would be limited to non-mechanized modes of travel.

3.3.15 Soils

Affected Environment

A wide variety of soil series occur within the Project Area. The properties of the soils vary widely due to the environmental conditions under which the soils were formed, the parent material from which they were formed, and current environmental conditions. The National Resource Conservation Service (NRCS) has developed Land Resource Units (LRUs) for the state of Arizona. Each LRU description contains soil series information along with the elevation and topography these soils are associated with, vegetation communities that occur in these soils, and land uses best suited to these soils.

The Lower Sonoran Desert Shrub LRU occurs south of I-40 along the Colorado and Bill Williams Rivers covering most of La Paz County. The Sonoran Mohave Desert Shrub LRU occurs near Lake Havasu City and the eastern portions of Mohave and La Paz Counties.

The most dominant two through the lower deserts are Orthids and Argids. These soils have developed in very arid climates and are typically light-colored soils containing little organic matter. Orthids are commonly calcerous and may contain horizons of cemented carbonates or silica (hardpan). Argid soils are finer-textured, and may contain clay or sodium accumulations in the subsurface.

A third primary soil type found in these LRUs is the Orthent soil type that has developed in a dry climate from parent materials resistant to weathering. These soils commonly overlie rock on steep slopes. They are generally very dry with shallow rooting environments.

Soils in the Project Area commonly have a rocky surface armor known as desert pavement, which protects finer-textured subsurface soils from erosion in the absence of abundant vegetation. An exception to these described soils can be found in the alluvial bottom lands associated with rivers and ephemeral drainage channels. These soil features are often very diverse within the same area, ranging from rocky sands to salt flats or fine silty loams. They are the most unpredictable soils in the area from a broad-scale mapping perspective; however, many of these alluvial soils along the Project Area rivers and intersects with washes have been mapped by the NRCS. Alluvial soils can be some of the most productive, or conversely some of the most barren, depending on watershed characteristics.

Biological soil crusts (BSCs) can be found in the desert areas of the Project Area. The visual appearance of soil crusts varies by region. In the Project Area deserts, BSCs tend to be flatter and less noticeable than the black knobby crust characteristic of the Colorado Plateau. Like many other desert life forms, desert crusts can often be found growing under a shrub or bush that provides shelter form the sun and wind. BSCs hold the soil surface together, forming a web of fibers. When wet, cyanobacteria mover through the soil and bind rock or soil particles together forming a web of fibers. Mosses and lichens have small structures that anchor the soil in place. All of these factors help to stabilize the soil, increasing its resistance to wind and water erosion. Soil crusts don't even have to be alive to continue their work. Layers of abandoned sheaths, built up over long periods, can still be found clinging to soil particles, providing stability in sandy soils up to 10 cm deep. Other crusts that appear to be dried out seem to come alive when doused with water, like the moss shown at right. Dry and grey when found, a sprinkling of water causes it to become metabolically active again. Cyanobacteria also convert atmospheric nitrogen to a form plants can use. This is especially important in desert ecosystems, where nitrogen levels are low and often limit plant productivity. Soil crusts also trap and store water, nutrients, and organic matter for use by plants. Many human activities can harm soil crusts. Trampling and crushing by footprints, bicycles, or motorized vehicles are extremely harmful, especially when the crusts are dry and brittle. Tracks in continuous strips, like those created by vehicles or bicycles, are highly vulnerable to wind and water erosion. Rainfall then carries away loose material, causing channelization. Impacted areas may never fully recover. Although a thin veneer of cyanobacteria may return in a few years, lichens and mosses may take up to 50 years to regrow (National Park Service 2012).

Environmental Consequences

Effects Common to All Alternatives

Direct effects of travel route designations on soil resources include compaction in washes, surface fracturing increasing potential for wind and water erosion, and crushing of soil crusts from increased human activity associated with access (i.e. off-route hiking, camping, etc.).

Indirect effects include wind and water erosion (e.g. rilling, gullying, etc.), loss of vegetative cover from increased human activity leading to decreased soil stability and productivity, propagation and spread of invasive species, which can out-compete native vegetation and increase the risk of soil-damaging wildfire.

No data were available on specific locations of particularly sensitive soils within the Project Area. For context on relative impacts of different designations, consult Table 3.28 in section 3.3.16, which shows overall Project Area designations.

No Action

The No Action alternative would leave 1,702 miles of routes open across the Project Area. An additional 35.2 miles of routes would be limited seasonally.

Proposed Action

The Proposed Action would designate 991 miles of open routes across the Project Area. An additional 34.6 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles

of routes would be limited to foot travel only, and 46 miles of routes would be limited to non-mechanized modes of travel.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes across the Project Area. An additional 1.6 miles of routes would be limited to foot travel only, and 9 miles of routes would be limited to non-mechanized modes of travel.

Access Alternative
This alternative would designate 1,417.7 miles of open routes across the Project Area. An additional 18.2 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 50.5 miles of routes would be limited to non-mechanized modes of travel.

3.3.16 Travel Management

Affected Environment

Because the Proposed Action is the establishment of a travel network composed of individual travel route designations, this discussion focuses on travel management in the context of route designations. There are various other components of travel management (maintenance, implementation, restoration, etc.) that are discussed in further detail under their own project-specific environmental analyses and which are addressed in the *Bouse and Cactus Plain Travel Management Plan* (see Appendix H). A designated route network of approximately 2,079 miles spans BLM and BR lands in the Project Area. Travel route designations in this network offer a range of experiences for both motorized and non-motorized users using a variety of vehicles (4WD, 2WD, ATV, OHV, horses, etc.) and no vehicles on a variety of routes. Route designations provide opportunities for route use based on recreation, commercial purposes, and authorized users (e.g., BLM staff, permittees, etc.). For a map of the transportation network as it currently is, see Maps 2 and 3 in Appendix B. The tables in Section 2.2 show a mileage breakdown of route designations by alternative. See the route reports in Appendix E for detailed information on each route's designation under each alternative.

Environmental Consequences

Effects Common to All Alternatives
Travel route designations have the potential to positively or negatively impact all resources and resource uses on BLM-administered lands. See all other resource element sections in Chapter 3 of this EA for more details. In general, travel route designations would enhance the BLM's ability to meet resource objectives as it provides a formal system and strategies for network management. Impacts from travel management vary with each alternative. All the action alternatives would impact the network by providing some form of travel route designation-based management (signing, monitoring, maintenance, etc.) based on a TMP and its associated EA. Table 3.28 below shows the total mileage of routes in the Project Area by their designations under each alternative.

Table 3.27. *Total Network Miles by Alternative and Designation*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Open	1,702.1	991.0	-42	455.1	-73	1,417.7	-17
Limited to authorized users	7.1	155.8	2,084	314.4	4,308	90.8	1,173
Limited to authorized users (with mgmt.)	-	34.6	n/a	-	-	18.2	n/a
Limited to foot travel	-	1.6	n/a	1.6	n/a	1.6	n/a
Limited to non-mechanized travel	-	46.0	n/a	9.0	n/a	50.5	n/a
Limited - seasonal	35.2	-	-100	-	-100	-	-100
Closed	334.4	849.9	154	1,298.8	288	500.1	50

No Action
The No Action alternative would leave 1,702 miles of routes open across the Project Area. An additional 35.2 miles of routes would be limited seasonally. Under the No Action alternative, routes would not be numbered or signed, and maps of the route network would not be produced.

Proposed Action
The Proposed Action would designate 991 miles of open routes across the Project Area. An additional 34.6 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 46 miles of routes would be limited to non-mechanized modes of travel.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes across the Project Area. An additional 1.6 miles of routes would be limited to foot travel only, and 9 miles of routes would be limited to non-mechanized modes of travel.

Access Alternative
This alternative would designate 1,417.7 miles of open routes across the Project Area. An additional 18.2 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 50.5 miles of routes would be limited to non-mechanized modes of travel.

3.3.17 General Vegetation

Affected Environment
Vegetation distribution within the Project Area varies with topography, available moisture, and drainage conditions. The majority of the vegetation within the Project Area is categorized as Desert scrub, with some smaller scattered areas of Mesquite/Ephemeral Wash Woodland and Riparian/Wetland Vegetation.

Desert scrub
The Desert scrub vegetation community consists of Lower Sonoran Desert scrub and Upper Sonoran Desert scrub.

Lower Sonoran Desert scrub dominant species include: Creosotebush *(Larrea tridentate),* White bursage *(Ambrosia dumosa),* Ocotillo *(Fouquieria splendens),* Brittlebrush *(Encelia farinose),* Fourwing saltbrush *(Atriplex canescens),* Blue palo verde *(Parkinsonia florida),* Foothill palo verde *(Parkinsonia microphylla.),* Saguaro *(Carnegiea gigantea),* Mesquite *(Prosopis sp.),* Ironwood *(Olneya tesota),* Catclaw acacia *(Acacia greggii),* Smoketree *(Psorothamnus spinosus),* and Big galleta grass *(Pleuraphis rigida thurb).*

Upper Sonoran Desert scrub dominant species include:Blue palo verde *(Parkinsonia florida),* Foothill palo verde *(Parkinsonia microphylla.),* Ironwood *(Olneya tesota),* Creosotebush *(Larrea tridentate),* White bursage *(Ambrosia dumosa),* Ocotillo *(Fouquieria splendens),* Jojoba *(Simmondsia chinensis),* Cholla *(Opuntia spp.),* Fish-hook pincushion *(Mammillaria grahamii),* Compass cactus *(Ferrocactus cylindracens),* and Saguaro *(Carnegiea gigantea).*

Mesquite/Ephemeral Wash Woodland
The Mesquite/Ephemeral Wash Woodland dominant species include: mesquite *(Prosopis sp.),* desert star vine *(Brandegea bigelovii),* cat's claw acacia *(Acacia greggii),* blue palo verde *(Parkinsonia florida),* ironwood *(Olneya tesota),* and saltcedar *(Tamarix sp.).*

Annual Plants
In years when precipitation is high in the winter and early spring, there is a significant increase in the number of annual plants on the desert floor appears, consisting of lupine (Lupinus spp.), daisies (Machaeranthera spp.), poppies (Eschscholzia spp.), and other common annuals. The summer monsoonal rains can also produce a summer or early autumn floral display. During favorable moisture conditions, all of these plants provide excellent forage for a variety of wildlife and make important organic contributions to the health of the vegetative community.

Environmental Consequences
Effects Common to All Alternatives
Direct effects of travel route designations on vegetation resources include dusting, which can lead to plant mortality, and effects that can occur with off-route use associated with expanded access such as soil compaction (leading to reduced water infiltration), damage to soil crusts, and trampling and crushing of vegetation.

Indirect effects include loss of vegetation, reduced soil productivity from compaction, reduced water infiltration and damage to soil crusts; soil loss through erosion following loss of vegetative cover (reduces potential for new vegetative growth); spread of invasive species and competition for limited available nutrients following soil disturbance; and increase in potential for wildfire associated with increased recreation access and spread of invasive species.

Vegetation discussed in this section is widely distributed throughout the Project Area, so for context on relative impacts of different designations, consult Table 3.28 in section 3.3.16, which shows overall Project Area designations.

No Action
The No Action alternative would leave 1,702 miles of routes open across the Project Area. An additional 35.2 miles of routes would be limited seasonally.

Proposed Action
The Proposed Action would designate 991 miles of open routes across the Project Area. An additional 34.6 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 46 miles of routes would be limited to non-mechanized modes of travel.

Resource Protection Alternative
This alternative would designate 455.1 miles of open routes across the Project Area. An additional 1.6 miles of routes would be limited to foot travel only, and 9 miles of routes would be limited to non-mechanized modes of travel.

Access Alternative
This alternative would designate 1,417.7 miles of open routes across the Project Area. An additional 18.2 miles of routes across the entire Project Area would be limited to authorized users with management, and could be opened to the public in the future; an additional 1.6 miles of routes would be limited to foot travel only, and 50.5 miles of routes would be limited to non-mechanized modes of travel.

3.3.18 Visual Resources

Affected Environment
All VRM classes described below are present in the Project Area. See Map 33 in the *LFHO RMP* for a depiction of the VRM distributions within the LHFO. The VRM classes describe objectives for the degree of landscape modification allowed. These objectives are provided below:

- Class I – To preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.
- Class II – To retain the existing character of the landscape. The level of change to the characteristic landscape should be low.
- Class III – To partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate.
- Class IV – To provide for management activities that would allow for major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

Table 3.29 below shows the proportion of the Project Area in each VRM class. Class I lands occur in Wilderness and WSA. Class II and III lands are concentrated in the northern part of the Project Area, and class IV lands are primarily in the southern part of the Project Area in the Bouse TMA.

Table 3.28. VRM Class Acreage and Percent of Project Area

VRM Class	Acres	% of total BLM/BOR lands in Project Area
I	109,626.2	18.2
II	122,086.8	20.3
III	160,768.7	26.7
IV	208,539.7	34.7

Environmental Consequences

Effects Common to All Alternatives

Travel route designations may increase damage and disruption to the natural appearance of landscapes by providing opportunities for route proliferation, littering, and sensitive resource damage. Routes also impact visual resources by creating contrasting lines where they do not follow natural curves found on the landscape. Changes in color and form from road cuts and cribbing for routes create visible impacts. In the desert environment, the amount of contrast caused by routes can diminish over time, but vehicle tracks and hiking trails can be seen years after the traffic has stopped. However, any establishment of a route network is expected to minimize route proliferation and decrease future degradation of visual resources. Under all alternatives, the use of certain management tools, such as the increased number of signs, route markers, and human-made barriers could affect the visual elements of line, form, and color on individual routes. Table 3.30 below shows miles of routes in each VRM class and their designations under each alternative.

Table 3.29 .Network Miles by VRM class

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
I	Open	0.3	0.3	n/a	0.0	-90	0.4	25
	Limited to authorized users	6.8	-	-100	0.3	-96	-	-100
	Closed	1.6	8.3	434	8.4	436	8.3	428
II	Open	224.1	110.8	-51	49.8	-78	159.8	-29
	Limited to authorized users	-	19.7	n/a	40.1	n/a	13.2	n/a
	Limited to authorized users (w/mgmt.)	-	5.2	n/a	-	n/a	1.8	n/a
	Limited to foot travel	-	0.9	n/a	0.9	n/a	0.9	n/a
	Limited to non-mechanized travel	-	40.1	n/a	7.6	n/a	42.8	n/a
	Limited - seasonal	4.8	-	-100	-	-100	-	-100
	Closed	34.8	87.0	150	165.3	375	45.2	30
III	Open	623.5	428.5	-31	196.7	-68	547.2	-12
	Limited to authorized users	0.3	20.3	6,782	86.4	29,226	10.6	3,483
	Limited to authorized users (w/mgmt.)	-	4.5	n/a	-	n/a	-	n/a
	Limited to foot travel	-	0.7	n/a	0.7	n/a	0.7	n/a

		No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
	Designation	Miles	Miles	% Δ from No Action	Miles	% Δ from No Action	Miles	% Δ from No Action
	Limited to non-mechanized travel	-	3.7	n/a	0.1	n/a	3.8	n/a
	Limited - seasonal	23.3	-	-100	-	-100	-	-100
	Closed	16.1	205.5	1,179	379.2	2,260	101.0	528
IV	Open	852.6	451.4	-47	208.6	-76	710.3	-17
	Limited to authorized users	0.2	115.8	51,690	187.6	83,828	67.1	29,914
	Limited to authorized users (w/mgmt.)	-	24.9	n/a	-	n/a	16.4	n/a
	Limited to non-mechanized travel	-	2.2	n/a	1.3	n/a	3.9	n/a
	Limited - seasonal	7.1	-	-100	-	-100	-	-100
	Closed	282.0	547.7	94	744.4	164	344.2	22

No Action
This alternative would leave open: 0.3 miles of routes in VRM class I; 224.1 miles in VRM class II, with an additional 4.8 miles limited seasonally; 623.5 miles in VRM class III, with an additional 23.3 miles limited seasonally; and 852.3 miles in VRM class IV, with an additional 7.1 miles limited seasonally.

Proposed Action
The Proposed Action would designate 0.3 miles of open routes in VRM class I; 110.8 miles of open routes in VRM class II, with an additional 5.2 miles "limited to authorized users with management", which could be opened at a future time; 428.5 miles of open routes in VRM class III, with an additional 4.5 miles "limited to authorized users with management", which could be opened at a future time; and 451.4 miles of open routes in VRM class IV, with an additional 24.9 miles "limited to authorized users with management", which could be opened at a future time.

Resource Protection Alternative
This alternative would designate 0 miles of open routes in VRM class I; 49.8 miles of open routes in VRM class II, 4196.7 miles of routes in VRM class III, and 208.6 miles of open routes in VRM class IV.

Access Alternative
This alternative would designate 0.4 miles of open routes in VRM class I; 159.8 miles of open routes in VRM class II, with an additional 1.8 miles "limited to authorized users with management", which could be opened at a future time; 547.2 miles of open routes in VRM class III; and 710.3 miles of open routes in VRM class IV, with an additional 16.4 miles "limited to authorized users with management", which could be opened at a future time.

3.3.19 Wild Burro Management

Affected Environment

There are portions of two wild burro Herd Management Areas (HMAs), Alamo and Havasu, within the Project Area. The Havasu HMA is split into two parts by the Colorado River, one on the California side and the other on the Arizona side. Burros do not cross the river.

Three Rivers Complex

The Havasu, Alamo, and Big Sandy HMAs are being managed as the Three Rivers Complex because of known animal migration behavior. The animals have access to the adjoining HMAs within the Three Rivers Complex. Alamo HMA adjoins both the Big Sandy HMA to the north and Havasu HMA to the west. Managing the HMA as a complex simply means coordinating census and removal efforts, thus producing more accurate and effective results and improved chances for funding.

Major physical features of the Three Rivers Complex include the Santa Maria and Big Sandy Rivers, Alamo Lake, Bill Williams River, Lake Havasu, Colorado River, and adjoining mountain ranges. The majority of the area is public land; with additional lands including state, private, Bill Williams River and Havasu National Wildlife Refuges, Alamo Lake State Park, and Alamo Wildlife Area. The private lands include several private farms along the rivers.

Alamo HMA

The Alamo HMA currently surrounds Alamo Lake and includes lands in Mohave, La Paz, and Yavapai Counties. The Alamo Interim Herd Management Area Plan became effective in 1977. It was an interim plan because it was in effect prior to the 1983 Lower Gila North Management Framework Plan. The Management Framework Plan effectively revised this plan. A herd gather conducted in July 2003 reduced the population to 200, which is the Appropriate Management Level (AML) for this area. Approximately five miles of the extreme western portion of the Alamo HMA is located within the Project Area.

Havasu HMA

Havasu Arizona Side

The Havasu HMA (Arizona side) was established in 1979 and includes an approximately 15-mile-wide strip that runs south from I-40, surrounds Lake Havasu City, and meets the Alamo HMA on the southeast side of the area. The HMA is bounded by the Colorado River on the west side and includes part of the Bill Williams River. The HMA is within Mohave and La Paz Counties. The estimated population in March 2004 was approximately 300 animals, based on the last census in 2001; the AML for this area is 170.

Havasu California Side

The California side of the Havasu HMA was added to the Havasu HMA in 1980 and includes a 1- to 6-mile strip of public lands on the California side of the Colorado River that is managed by LHFO. This portion of the Havasu HMA adjoins the Chemehuevi HMA, which is managed by the Needles, California, BLM Field Office. These two HMAs have common burro herds.

The Northern and Eastern Colorado Desert Coordinated Management Plan was approved for California in December 2002. The Plan combines the California side of the Havasu HMA with

the Chemehuevi HMA, renaming the combined HMA as Chemehuevi HMA, changing the boundary, and reducing the AML from 150 to 108.

Environmental Consequences

Effects Common to All Alternatives

Direct effects on wild burros from travel route designations include disturbance to wild burros, and collisions and injury from motorized vehicles. Travel route designations also provide beneficial access for wild burro herd management, such as monitoring and herd gathers.

Indirect effects include those that could damage support components of grazing forage, such as damage to soils and vegetation from unauthorized and illegal off-route use, soil disturbance and loss leading to propagation of invasive species and increased risk of wildfire, etc.

Table 3.31 below shows miles of routes in HMAs within the Project Area and their designations under each alternative.

Table 3.30. *Miles of Routes in Herd Management Areas*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Miles**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**	**Miles**	**% Δ from No Action**
Open	319.5	204.5	-36	113.8	-64	259.9	-19
Limited to authorized users	-	10.9	n/a	10.9	n/a	9.8	n/a
Limited to authorized users (w/mgmt.)	-	1.8	n/a	1.8	n/a	1.8	n/a
Limited to foot travel	-	0.9	n/a	0.9	n/a	0.9	n/a
Limited to non-mechanized travel	-	32.2	n/a	32.2	n/a	32.2	n/a
Limited - seasonal	27.3	-	-100	-	-100	-	-100
Closed	2.2	98.6	4,422	98.6	4,422	44.4	1,936

No Action

The No Action alternative would leave open 319.5 miles of routes in HMAs; an additional 27.3 miles of routes in HMAs would be limited seasonally.

Proposed Action

The Proposed Action would designate 204.5 miles of open routes in HMAs. An additional 1.8 miles of routes would be would be limited to authorized users with management, and could be opened to the public in the future.

Resource Protection Alternative

This alternative would designate 113.8 miles of open routes in HMAs. An additional 1.8 miles of routes would be would be limited to authorized users with management, and could be opened to the public in the future.

Access Alternative
This alternative would designate 259.9 miles of open routes in HMAs. An additional 1.8 miles of routes would be would be limited to authorized users with management, and could be opened to the public in the future.

3.3.20 Abandoned Mine Lands (AML)

Affected Environment

Internal scoping from the BLM ID team identified abandoned mines as a resource that could affect route designation and public safety. Abandoned Mine Lands (AML) include features including but not limited to: open adits, shafts, declines, trenches, pits, and high walls, and were abandoned prior to January 1, 1981, the effective date the CFR 3809 surface management regulations were established. These AML sites are public safety hazards as well as points of historical interest and rock collecting spots.

Public safety hazards present include physical safety hazards (i.e. open features) and environmental safety hazards due to heavy metals and acids found in mill tailings. Mitigating these safety hazards range from posting public information ("Stay Out, Stay Alive" signage) to fencing, steal hard-closures, backfilling open features, or closing access routes. Environmental contaminants can be removed after they are identified in detailed surveys.

The full extent of all these AML hazards is unknown as a comprehensive survey has not been conducted. However, several AML features were identified during route inventory, which are outlined in the table below (Table 3.32).

Table 3.32. *Number of Routes Providing Access to AML Sites*

	No Action	Proposed Action		Resource Protection Alternative		Access Alternative	
Designation	**Number**	**Number**	**% Δ from No Action**	**Number**	**% Δ from No Action**	**Number**	**% Δ from No Action**
Open	57	44	-22.8	13	-77.2	68	19.3
Limited seasonally	1	-	-100.0	-	-100.0	-	-100.0
Limited to authorized users w/ mgmt.	-	17	n/a	-	n/a	-	n/a
Limited to authorized users	2	-	-100.0	10	400.0	5	150.0
Limited to non-mechanized travel	-	3	n/a	3	n/a	3	n/a
Closed	27	23	-14.8	61	125.9	11	-59.3

Environmental Consequences

No Action

The No Action alternative would provide the greatest number of open routes providing access to mining features. This alternative would leave access to the greatest number of AML sites open, which may not be safe for the public to visit. The No Action alternative would designate all routes open regardless of open abandoned mine features.

Proposed Action
This alternative would leave 44 routes open that provide access to AML sites. Of routes providing access to AML sites, it would limit 20 routes to authorized users and limit three routes to non-mechanized travel. This alternative would minimize the potential for the public to encounter AML-related dangers, but it would not eliminate motorized and non-mechanized travel near AML sites.

Resource Protection Alternative
This alternative would leave 13 routes open that provide access to AML sites. Of routes providing access to AML sites, it would limit 10 routes to authorized users and limit three routes to non-mechanized travel. This alternative would greatly minimize the potential for the public to encounters AML-related dangers, but it would still provide motorized and non-mechanized travel near AML sites.

Access Alternative
This alternative would leave 68 routes open that provide access to AML sites. Of routes providing access to AML sites, it would limit five routes to authorized users and limit three routes to non-mechanized travel. This alternative would minimize the potential for the public to encounters AML-related dangers while still providing non-mechanized travel and relatively high levels of motorized travel near AML sites.

3.4 MITIGATION COMMON TO MULTIPLE RESOURCES

Some mitigation needs were taken into consideration during route evaluation to mitigate detrimental impacts travel route designations may have on biological resources. Mitigation could include, but would not necessarily be limited to: route closure, seasonal use restriction, rerouting, vehicle type restrictions, vehicle speed restrictions, or other mitigation measures appropriate to the nature of the conflict (BLM Lake Havasu Field Office 2007).

During evaluation, similar considerations were taken into account for plants and other resources. Routes with planned mitigation have some form of “open with management” or “limited with management” designation, and specific details on this mitigation management can be found in route reports (see Appendix D). For details on travel route designation-related monitoring (often an aspect of mitigation) that may be undertaken in the Project Area, see the Bouse and Cactus Plain Travel Management Plan.

Moreover, for situations in which human use on routes degrades particular habitats, the following mitigation measures from the RMP would be applicable:

1. Request certain behavior from route users through signs and other information.
2. Place limitations of use on the route (time of season of use, type of use, number of users, behavioral requirements).
3. Reroute the route.
4. Replace habitat to offset problems caused by human use; some methods could be:
    a. Augment food/water sources.
    b. Place barriers along route to protect specific habitat features.
    c. Relocate or expand reproduction sites to be away from the route.
5. Close route if no suitable mitigation is possible; make plan for reclamation.

Land may be acquired by the BLM to expand or replace species habitat as part of mitigating travel route designations' impacts.

3.5 RESIDUAL EFFECTS COMMON TO MULTIPLE RESOURCES

Residual effects are those that remain after mitigation measures are applied. They are not discussed for the No Action alternative because no new mitigation is proposed. For the action alternatives, after mitigation implementation, some detrimental residual effects may remain, including persistent invasive species that never completely go away, continued erosion and soil destabilization caused by natural forces that are difficult or impossible to control, route proliferation, off-road vehicle travel, and other illegal activities on/near routes. Residual effects are more likely to occur if mitigation is infrequent and or minimal.

4.0 CUMULATIVE EFFECTS ANALYSIS

4.1 CUMULATIVE EFFECTS OVERVIEW AND BACKGROUND

The Council on Environmental Quality regulations define cumulative impacts as the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Past, present, and reasonably foreseeable future actions are analyzed to the extent that they are relevant and useful in determining whether the reasonably foreseeable effects of the Proposed Action and/or Alternatives may have an additive relationship to those effects. The resources considered in this analysis include:

- Air quality
- Soils, vegetation, and invasive/non-native weed species
- Water resources, water quality and riparian resources;
- General wildlife;
- Special status species;
- Cultural resources
- Livestock grazing and wild burros
- Recreation and travel management;
- Special management designations;
- Lands with Wilderness Characteristics;
- Socioeconomics; and
- Abandoned Mine Lands (AML)

4.1.1 Cumulative Effects Analysis Methodology

Because of the lack of detailed information available for the broad scope of cumulative effects analysis, the cumulative effects discussion for this analysis is generalized and primarily qualitative. The incremental level of effects of the action alternative's travel management networks are discussed through a comparison of past, present, and reasonably foreseeable future known or anticipated conditions presented below in Tables 4.1 and 4.2, against the baseline conditions of the No Action Alternative.

4.1.2 Timeframe of Effects

The cumulative effects analysis considers past, present, and reasonably foreseeable plans, projects, or actions of other Federal, non-federal agencies, persons or groups identified as having the potential to result in incremental impacts when taken together with the Proposed Action. The timeframe for analysis is 10 years, the expected life of the project.

4.1.3 Cumulative Effects Study Area

The cumulative effects analysis discussion considers the impacts of the alternatives in the context of the broader human environment that extends beyond the scope and general vicinity of BLM lands in the Project Area. Since much of the past and present development and use of the area, as well as the area's biological resources, are tied closely to the Colorado River and Bill Williams River corridors, the analysis area will consist of *all* the lands within the Lake Havasu Field Office, which will be referred to as the cumulative effects study area (CESA).

4.1.4 Past, Present, and Reasonably Foreseeable Future Actions

Plans

The LHFO RMP is the only past or current land-use level plan in the CESA. The following management plans are in the CESA: Gibraltar Interdisciplinary Management Plan, La Posa Interdisciplinary Management Plan, and the Parker Strip Recreation Area Management Plan. Project-level plans in the CESA include the Bouse and Cactus Plain TMP, Havasu TMP, La Posa TMP, and Bullhead TMP.

Socioeconomics

The 2007 LHFO ARMP and ROD selected the travel management alternative with the largest area of designated 'open' OHV use. LHFO continues to be a popular area for OHV use, perhaps more so because of additional open areas, and this use contributes to the local and regional tourism industry.

The Project Area is primarily located in La Paz County and Mohave County in Arizona with its northwestern portion spilling into San Bernardino County. San Bernardino County's large population routinely engages in Project Area visits. According to the *LHFO Proposed RMP and Final EIS*: "The area of residence of at least 70% of the summer visitors to the BLM lands in the [LHFO] planning area is San Bernardino and Riverside, (California) Counties" (BLM Lake Havasu Field Office 2006). It is assumed for this cumulative effects analysis that the 70% share would remain constant throughout the foreseeable future (BLM Lake Havasu Field Office 2006). Communities in the CESA have large numbers of seasonal (winter) residents; these numbers have been increasing and are expected to continue to do so.

Population growth within La Paz County decreased 0.9 percent between the 2010 and 2016 census, while growth in Mohave County increased a modest 1.7 percent. Population growth in San Bernardino County, CA increased by 3.4 percent. Overall, Arizona's population growth increased by 5 percent during the 2010-2016 time period, while California's growth increased by 3.6 percent (U. S. Census Bureau 2018). Population growth and development within the CESA would likely continue to occur at levels similar to the past several years. Public lands provide recreational opportunities for increasingly larger numbers of local and regional users. At current

rates, by 2020, it is conceivable that the Lake Havasu area could experience visitation as high as 1,000,000 annually

Air Quality
Development in and upwind of the Project Area has disturbed soils and created airborne dust and particulates in areas of use. With the increase in traffic both on and off highway, noise has also increased. Growth in the LHFO area should continue into the foreseeable future. Within the Colorado River corridor, the majority of lands are comprised of private, tribal, and Arizona State Trust properties. Growth is concentrated in the river corridor, and most growth would continue there. With the continued use and development of BLM neighboring lands, dust is likely to persist as a problem in the CESA into the foreseeable future. Air resources on public lands may continue to be affected by uses and development outside of the Project Area.

Water Resources, Water Quality, and Riparian Resources
The construction of the Parker and Alamo Dams have altered the natural riparian renewal processes that initially existed below these dam areas on the Bill Williams and Colorado Rivers, resulting in riparian resources in these areas being classified as Functional at Risk, with increasing propagation of exotic species such as the invasive saltcedar. A few of these areas have been targeted for treatment and replanting of native species such as cottonwood, willow, quailbush, and mesquite. Two extreme flood releases of Alamo Lake in the 1990s have resulted in a more natural revegetation of native riparian habitat below Alamo Dam and this stretch of river is in an upward trend.

Water quality testing of ground and surface water resources in the Project Area has indicated that quality generally meets or exceeds standards for beneficial uses in most areas. Some testing has been inconclusive, and testing of groundwater wells in the Ranegras Plain Groundwater Basin indicated concentrations that exceeded primary maximum concentration levels for arsenic, chromium, fluoride, and nitrates (AZ Department of Environmental Quality 2012). Water quality in Lake Havasu adjacent to and north of the Project Area has generally tested as acceptable for all beneficial uses including full-body-contact.

Cultural Resources
Designations of areas as open, limited, or closed in the 2007 LHFO ARMP and ROD and the decision to develop travel management plans has limited travel to existing routes in some areas, and closed others. Travel management plans have been completed for portions of the CESA. These decisions and actions have curtailed cross-country OHV travel, reducing potential for cumulative effects on cultural resources in these adjoining areas to some extent.

Livestock Grazing and Wild Burros
The Project Area's grazing allotments comprise about 22 percent of the CESA's allocated grazing AUMs. In the ten-year period preceding the 2007 LHFO RMP, two of the ephemeral allotments bordering the Bill Williams River had not been used. Numerous springs, water catchments, wells etc. have been developed to provide water for livestock and wildlife.

Wild burros are being managed within three Habitat Management Areas (HMAs) known collectively as the Three Rivers Complex. The majority of the complex is public land; with

additional lands including state, private, Bill Williams River and Havasu National Wildlife Refuges, Alamo Lake State Park, and Alamo Wildlife Area. The private lands include several private farms along the rivers.

The Alamo Herd Management Area Plan was established in 1977, and revised by the Lower Gila North Management Framework Plan in 1983. A herd gather conducted in 2003 reduced the burro population to 200, which is the appropriate management level (AML) for the area.

The Havasu (Arizona side) HMA was established in 1979. Estimated burro population in 2004 was about 300 animals with an AML of 170.

The California side of the Havasu HMA was added in 1980 and is managed by the Needles, California BLM Field Office. The Northern and Eastern Colorado Desert Coordinated Management Plan was approved in 2002, combining the California side of the Havasu HMA with the Chemehuevi HMA and establishing an AML of 108 animals.

Recreation and Travel Management

Other Travel Management Plans near or adjacent to the Project Area have been completed: Havasu TMP/EA was completed by the Lake Havasu Field Office in 2013; LaPosa TMP/EA was completed by the Yuma Field Office in 2010; Bullhead TMP was completed by the LHFO in 2009. Travel management plans implemented within the CESA would provide designated access for recreation users as well as resource managers (i.e. BLM, AZGFD, BR, etc.). It is likely that these plans would help to mitigate effects from increased visitation somewhat by providing for designated non-motorized use access, limited to authorized user access, as well as open OHV access.

The Proposed Arizona Peace Trail could be designated within the foreseeable future providing for a unique OHV opportunity through most of the CESA, which would be expected to increase use of those particular routes.

Special Designations

The Project Area includes two ACECs: the Swansea Historic District which is eligible for inclusion in the National Register of Historic Places (NHRP); and a 1,500 acre portion of the 10,240 acre Three Rivers Riparian Area. Both of these areas are subject to disturbance and potential degradation from recreational use; however, access to the riparian ACEC is currently limited.

The Project Area also includes two of three river segments of the Bill Williams River designated as ‘suitable’ in 1994 for inclusion into the National Wild and Scenic River System. Current access is primarily limited to non-motorized use, particularly the lower ‘Segment 3’ of the river which is in the designated Swansea Wilderness, and generally inaccessible except by trail or float.

Lands with Wilderness Characteristics

Two blocks of public lands outside of designated wilderness were proposed to be protected for their wilderness characteristics by the Arizona Wilderness Coalition in 2003 and documented in

Wilderness and General Management Proposals to the Bureau of Land Management Lake Havasu Field Office (AZ Wilderness Coalition 2003). BLM updated their wilderness characteristics inventory in 2004.

Abandoned Mine Lands (AML)
Any mining activity considered part of Abandoned Mine Lands was abandoned prior to 1981. Due to the implementation of surface management regulations, present mining operators are required to post a financial guarantee and held to reclamation standards. AML features would continue to be inventoried, monitored, and reclaimed in high use areas.

4.2 CUMULATIVE EFFECTS ANALYSIS BY RESOURCE OR RESOURCE USE

4.2.1 Air Quality

No Action
Past and present actions such as those presented above for air quality, together with developments in OHV technology, population growth and associated development in the CESA have disturbed soils and created airborne dust and particulates. Population growth, development and recreation use in the foreseeable future in and around the Project Area would continue to exacerbate current air quality concerns of airborne particulates. The No Action alternative would result in the highest levels of OHV use, adding to airborne particulates. Some locations in the Project Area in San Bernardino County, already in non-attainment for PM-10, could experience similar air quality effects during high use periods.

All Action Alternatives Including the Proposed Action
Designating travel routes and limiting motorized travel to designated routes under all action alternatives would reduce OHV use, thereby reducing overall levels of airborne dust.

4.2.2 Biological Resources (Including: Soil, Water, Riparian Areas, Vegetation, Invasive Species, Wildlife, and Special Status Species)

No Action
Past and present actions such as those discussed above for individual biological resources, together with developments in OHV technology, population growth, development and use on public, private, and state lands have contributed to ever-increasing adverse effects on the biological resources within the CESA.

Under the No Action alternative, which allows for the highest number of travel routes open to OHV use, and lowest number of limited-use routes, there would be more motorized travel-related effects, and an increase in the overall level of cumulative effects on the CESA's biological resources.

All Action Alternatives Including the Proposed Action
Under all action alternatives, there would be decreases in open network miles available for OHV use and corresponding decreases in effects on the Project Area's biological resources as compared to the No Action alternative. This would result in a decrease in overall cumulative effects on biological resources within the CESA.

4.2.3 Cultural Resources

No Action

Past and present actions such as those discussed above for cultural resources, together with developments in OHV technology, population growth, development and use on public, private, and state lands within and adjacent to the Project Area have contributed to effects on cultural resources within the CESA.

Under the No Action alternative, which allows for the highest number of travel routes open to OHV use, and least amount of limited use, there would be increased potential for damage to cultural resources from the human use associated with enhanced access. This would result in a increase in overall cumulative effects on cultural resources.

All Action Alternatives Including the Proposed Action

Under all action alternatives, there would be decreases in open network miles available for OHV use resulting in decreased access and human use. Reduced access would lower the potential for damage to cultural sites and provide for a decrease in the overall cumulative effects on cultural resources within the CESA.

4.2.4 Livestock Grazing and Wild Burros

No Action

Past and present actions such as those discussed above for livestock grazing and wild burros, together with developments in OHV technology, population growth, development, and use on public, private, and state lands within and adjacent to the Project Area have contributed to effects on grazing and wild burros within the CESA.

Under the No Action alternative, which allows for the highest number of travel routes open to OHV use, and lowest number of limited use-routes, there would be continued effects on forage used by livestock and burros within the Project Area, as well as increased incidence of disturbance and potential for injury to livestock and burros from collisions with vehicles. OHV access can also result in damage to watering facilities, fences, etc.

All Action Alternatives Including the Proposed Action

Under all action alternatives, there would be decreases in open network miles available for OHV use and corresponding decreases in effects on livestock grazing and wild burros. Reduced access and would result in fewer effects on forage and disturbance and lead to a decrease in cumulative effects on grazing and burro management within the CESA.

4.2.5 Recreation and Travel Management

No Action

Past and present human actions within the CESA on public, private, and state lands that have affected recreation include the 2007 LHFO RMP and Interdisciplinary Plans included in it, developments in OHV technology, growth in outdoor recreation, and development in and around the Project Area. Reasonably foreseeable future actions that could affect recreation and travel management including the designation of the Proposed Arizona Peace Trail, future travel management plans, and continued population growth and economic development.

Under the No Action alternative, there would be more travel routes that are open to OHV, while fewer routes are limited to non-motorized use or closed. The amount of motorized use would likely continue to increase in conjunction with population growth and development.

Under the No Action alternative, continuation of the current management travel network would not offer much opportunity in the way of diverse user experiences (e.g. ATV only, non-motorized, non-mechanized, etc.), resulting in a decrease in overall user experiences or opportunities within the CESA.

For motorized users, the No Action alternative could result in an overall increase in user satisfaction for those CESA users not seeking diverse travel-related experiences, however, there would be no signs placed or maps produced, limiting the utility of the route network.

All Action Alternatives Including the Proposed Action
Under all of the action alternatives, there would be a reduction in Project Area network miles designated as open for all users and travel modes. This would result in a decrease in motorized access throughout the Project Area; however, the signing of routes and availability of maps would enhance the recreational opportunities afforded by the route network. In addition, there would be an increase in limited access opportunities and experiences that would benefit non-motorized uses such as hiking, equestrian, bicycling, and backpacking. This would allow for an overall increase in recreational experiences and opportunities within the CESA.

Reasonably foreseeable future actions include development of additional travel management plans within the CESA. These plans would provide for more diverse recreational experiences. In addition, the reasonably foreseeable designation of the Proposed Arizona Peace Trail would add a diverse recreational opportunity for those OHV enthusiasts seeking an extended travel route experience within the CESA. Together these foreseeable future actions would enhance overall outdoor recreation user experiences and satisfaction within the CESA as compared to the No Action alternative.

4.2.6 Special Designations

No Action
Past and present actions such as those discussed above for special designations, together with developments in OHV technology, population growth, development and use on public, private, and state lands within and adjacent to the Project Area have contributed to effects on special designations.

Under the No Action alternative, there would be a number of travel routes open to OHV, while relatively few routes would be limited to non-motorized use. The amount of motorized use would likely continue to increase in conjunction with population growth and development, placing more stresses on specially designated areas within the Project Area.

All Action Alternatives Including the Proposed Action
Under all of the action alternatives, there would be an overall reduction in the number of miles designated as open for all users and travel modes. This would result in a decrease in motorized access throughout the Project Area, and an increase in limited access opportunities and

experiences benefitting non-motorized uses such as hiking, equestrian, bicycling, and backpacking. Access that is more limited would help reduce stress on the two ACEC areas within the Project Area, and result in an overall increase in protection to specially designated areas within the CESA.

4.2.7 Wilderness, Wilderness Study Areas, and Lands with Wilderness Characteristics

No Action

Past and present actions such as those discussed above for lands with wilderness characteristics, together with developments in OHV technology, population growth, development and use on public, private, and state lands within and adjacent to the Project Area are contributing to effects on lands with wilderness characteristics.

Under the No Action alternative, there would be a number of travel routes that are open to OHV, while relatively few routes are limited to non-motorized use. The amount of motorized use would likely continue to increase in conjunction with population growth and development, placing more pressure on the lands determined to contain wilderness characteristics within the Project Area.

All Action Alternatives Including the Proposed Action

Under all of the action alternatives there would be an overall reduction in Project Area network miles designated as open for all users and travel modes. This would result in a decrease in overall motorized access throughout the Project Area, and an increase in limited access opportunities benefitting non-motorized uses such as hiking, equestrian, bicycling, and backpacking. More limited non-motorized access, and in some cases, non-mechanized access, would help mitigate impacts that could adversely affect or degrade wilderness characteristics for the two blocks of public lands within the Project Area. From a cumulative effects standpoint limiting access to that consistent with protection of wilderness characteristics would lead to a decrease in cumulative effects on wilderness characteristics overall within the CESA.

4.2.8 Socioeconomics

No Action

Past and present actions such as those discussed above for socioeconomics, together with developments in OHV technology, population growth, development and use on public, private, and state lands within and adjacent to the Project Area have contributed to positive effects on socioeconomic development.

Under the No Action alternative, there would be continuing economic growth within the Project Area, incrementally adding to growth within the CESA.

All Action Alternatives Including the Proposed Action

Under all of the action alternatives, there would be an overall reduction for Project Area network miles designated as open for all users and travel modes. This would result in a decrease in motorized access throughout the Project Area; however, there would be an increase in limited access opportunities and experiences that would benefit non-motorized uses such as hiking, equestrian, bicycling, and backpacking since it would segregate these non-motorized activities from motorized activities. More diverse travel-related recreation opportunities and experiences

are likely to attract more users while protecting many of the resources that users visit the area to enjoy. It is likely that any of the action alternatives would result in an overall similar level of incremental growth in economic development as that of the No Action alternative.

4.2.9 Abandoned Mine Lands

No Action

Past and present actions such as those discussed above for cultural resources, together with developments in OHV technology, population growth, development and use on public, private, and state lands within and adjacent to the Project Area have contributed to effects on AML.

Under the No Action alternative, which allows for the highest number of travel routes open to OHV use, and least amount of limited use, there would be increased potential for access to AML sites, damage to AML resources, and an increased risk to public health and safety. This would result in an increase in overall cumulative effects on AML resources.

All Action Alternatives Including the Proposed Action

Under all action alternatives, there would be decreases in open network miles available for OHV use resulting in decreased access and human use. Reduced access would lower the potential for public safety risks, damage to AML sites, and provide for a decrease in the overall cumulative effects on AML resources within the CESA.

5.0 CONSULTATION AND COORDINATION

A scoping letter was posted on the project website. Scoping information was emailed or mailed to interested parties and local, state, and federal agencies.

There were 13 public comment letters, emails, or forms received during the 2017 scoping period, six of which contained substantive comments. Substantive comments are those that suggest an action or provide additional information. These comments, along with written comments on the project maps during the scoping meetings, were considered during development of this TMP/EA and incorporated as appropriate.

6.0 LIST OF PREPARERS

The tables below show all BLM staff, other agency staff and ARS staff that were involved and participated in scoping, route evaluation (since initial work in 2010), and preparation of the TMP and EA. Some of the individuals listed in each table no longer work in those positions. Titles listed are the individual's position at the time of their involvement as noted.

Table 6.1. *BLM Preparers*

Name	Title
Doug Adams	Acting Wildlife Biologist*
Mike Ahern	Assistant Field Manager*
Sheri Ahrens	Realty Specialist
Shawna Aitken	Intern
Victoria Anne	NEPA Coordinator*
Jason Barangan	Assistant Manager*
Brad Baron	Law Enforcement*
Craig Beck	Outdoor Recreation Planner*

Name	Title
Vincent Beresford	Geologist
Kristen Cox	GIS Analyst Intern
Amanda Deeds	Outdoor Recreation Planner*
Amanda Dodson	Geologist*
Kerry Gaiz	GIS Specialist
Bill Gibson	State Travel Management Coordinator
Jessica Han	Archaeologist
James Honeycutt	GIS Analyst Intern
Jen House	Travel Management Coordinator*
Shari Ketcham	Wildlife Biologist*
Caroline Kilbane	Outdoor Recreation Planner
Myron McCoy	Outdoor Recreation Planner*
Jennifer Frederick McGuire	Archeologist*
Paul Misiaszek	Geologist
Eyn Philips	GIS Analyst Intern
Dave Roan	Outdoor Recreation Planner*
Angelica Rose	Planning and Environmental Coordinator
George Shannon	Archaeologist*
Lisa Stapp	Realty Specialist
Amy Titterington	Geologist*
Victor Vizcaino	GIS Specialist*
Jason West	Assistant Field Office Manager
Brandon Zimmerman	GIS Specialist*

* this was their title at the time of their participation

***Table 6.2**. Other Agency Participants*

Name	Title	Agency
Lainie Antolik	Wildlife Biologist	AZ Game and Fish Dept.
Suzy Ehret	Wildlife Manager	AZ Game and Fish Dept.
Bill Knowles	Habitat Program Manager	AZ Game and Fish Dept.
Stew Kohnke	Wildlife Manager	AZ Game and Fish Dept.
Scott Ozborn	Game Warden	AZ Game and Fish Dept.
Dee Pfleger	Wildlife Manager	AZ Game and Fish Dept.

***Table 6.3**. ARS (Contractor) Participants*

Name	Title
Les Allert	Programmer
Brian Bishop	Route Evaluation Facilitator/GIS Specialist/Planner
Tom Folks	Route Evaluation Facilitator/Planner
Dennis Gale	Planner
Derek Givens	GIS Specialist/Planner
Nate Holland	Route Evaluation Facilitator/Planner
Tristan Howard	Planner/GIS Specialist
Ernie McKenzie	Route Evaluation Facilitator
Becky Riley	Route Evaluation Facilitator
Les Weeks	Planner