



LAKE MEREDITH NATIONAL RECREATION AREA

FINAL OFF-ROAD VEHICLE MANAGEMENT PLAN /

ENVIRONMENTAL IMPACT STATEMENT

January 2015

EXECUTIVE SUMMARY

This Lake Meredith National Recreation Area Off-road Management Plan / Environmental Impact Statement (plan/EIS) analyzes a range of alternatives and actions for the management of off-road vehicle (ORV) use at Lake Meredith National Recreation Area (the national recreation area). The plan/EIS assesses the impacts that could result from continuing current management (the no-action alternative) or implementation of any of the three action alternatives.

Upon conclusion of this plan and decision-making process, the alternative selected for implementation will become the ORV management plan, which will guide the management and control of ORVs at the national recreation area for the next 15 to 20 years. The plan will also form the basis for a special regulation to manage ORV use at the national recreation area.

BACKGROUND

Lake Meredith was originally created by the construction of the Sanford Dam on the Canadian River in 1965, referred to as the Canadian River Project. The Sanford Dam was designed and built by the Bureau of Reclamation (BOR) to allow impoundment and diversion of water for municipalities in the Texas panhandle, including Amarillo, Borger, Brownfield, Lamesa, Levelland, Lubbock, O'Donnell, Pampa, Plainview, Slaton, and Tahoka. The National Park Service (NPS) became involved with the recreational use of the area in 1961 through a memorandum of understanding and agreement with the BOR (Contract No. 14-06-500-579). This agreement authorized the NPS to investigate, plan, and develop recreational resources for the Canadian River Project. In March 1964, another memorandum of agreement between the NPS and the BOR established that the public recreational use for the Canadian River Project area would be the responsibility of the NPS. By 1968, the BOR turned over the operation and maintenance of the Sanford Dam and associated facilities to the Canadian River Municipal Water Authority (CRMWA), resulting in a cooperative effort between the NPS and the CRMWA for the management of the reservoir and its facilities. This reservoir was referred to as the Sanford Recreation Area until 1974, when it was renamed to Lake Meredith Recreation Area in honor of A. A. Meredith, a civic leader and early promoter of the lake.

On November 28, 1990, Public Law 101-628, 16 U.S. Code (USC) 460eee, established the area as NPS land, stating, "In order to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters, there is hereby established the Lake Meredith National Recreation Area." The national recreation area, containing over 44,977 acres, preserves one of the largest manmade lakes in the Texas panhandle, many archeological sites, and flora and fauna of the area, making it a valuable part of American heritage. From 1971 through 2008, over 55 million people visited the national recreation area, which is an average of almost 1.5 million visitors annually.

PURPOSE OF THE PLAN

The purpose of this plan/EIS is to manage ORV use in the national recreation area for visitor enjoyment and recreation opportunities, while minimizing and correcting damage to resources.

NEED FOR ACTION

The Lake Meredith National Recreation Area provides a variety of visitor experiences, including the use of ORVs. In the 1970s, a special regulation in Title 36 of the Code of Federal Regulations (CFR),

Section 7.57, designated two authorized ORV use areas in the national recreation area: Blue Creek at the north end and Rosita (also known as Rosita Flats) at the south end. ORV use at the national recreation area has changed drastically since the establishment of the special regulation and the first use of ORVs, both in intensity and in the types of ORVs used. Modern all-terrain vehicles (ATVs) are the primary ORVs used today; however, they were not in use when the original regulations took effect. The intensity of ORV use at the national recreation area affects natural and cultural resources and results in visitor use conflicts.

As a result of these considerations, an ORV management plan for Lake Meredith National Recreation Area is needed at this time to

- Comply with Executive Order 11644, Use of Off-road Vehicles on Public Lands, as stated in *Friends of the Earth v. Department of Interior*
- Provide for sustainable recreational ORV use areas
- Address the lack of an approved plan, which has led to ORV use outside of authorized areas
- Address resource impacts resulting from ORV use
- Address the change in numbers, power, range, and capabilities of ORVs.

OBJECTIVES IN TAKING ACTION

Objectives are “what must be achieved to a large degree for the action to be considered a success.” All alternatives selected for detailed analysis must meet project objectives to a large degree and resolve the purpose of and need for action. Objectives must be grounded in the national recreation area’s enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided by the national recreation area’s general management plan (GMP), strategic plan, and/or other management guidance. National recreation area staff identified the following objectives for developing this plan/EIS.

VISITOR USE AND SAFETY

- Manage ORV use to minimize conflicts among different ORV users.
- Promote safe operation of ORVs and safety of all visitors.

MANAGEMENT

- Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.

NATURAL RESOURCES

- Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.
- Define effective strategies for soil erosion control and restoration of plant resources to support wildlife populations.

NATIONAL RECREATION AREA OPERATIONS

- Identify ORV plan implementation needs and costs.
- Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.

PURPOSE AND SIGNIFICANCE OF LAKE MEREDITH NATIONAL RECREATION AREA

All units of the national park system were established for a specific purpose and to preserve significant resources or values for the enjoyment of future generations. The purpose and significance identify uses and values that individual NPS plans should support. The following provides background on the purpose and significance of Lake Meredith National Recreation Area.

As stated in the national recreation area's enabling legislation, Congress established Lake Meredith National Recreation Area in 1990 "to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters" (16 USC 460eee) (Public Law 101-628).

A park significance statement captures the essence of the park's importance to the nation's natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to each park's purpose. The following significance statements recognize the important features of the national recreation area. As stated in the *Lake Meredith National Recreation Area General Management Plan*, the national recreation area has the following significance:

Lake Meredith National Recreational Area is the largest area of public lands in the Texas panhandle, providing opportunities for access to diverse, affordable outdoor land- and water-based recreation activities.

Lake Meredith and Canadian River basin in the recreation area provide aquatic, wetland, and riparian habitats, and one of the few areas in the region with trees. These habitats and the ecological transition zones between them and the surrounding landscape support diverse plant and animal species, including migratory waterfowl.

The natural and geologic resources of the recreation area have enabled human survival, subsistence, and adaptation that have resulted in a continuum of human presence in the Texas panhandle for more than 13,000 years. Cultural sites in Lake Meredith National Recreation Area and the adjacent Alibates Flint Quarries National Monument offer views of lifeways in every cultural period that have been identified.

The exposed geologic features of the Canadian River breaks in the recreation area reveal active geological processes that are easily visible to an extent not present elsewhere in the region. The topography and geography of the Canadian River breaks create a divergence from the surrounding landscape that offers scenic values and opportunities not found elsewhere in the region.

ISSUES AND IMPACT TOPICS

The national recreation area staff identified issues associated with implementing an ORV management plan at Lake Meredith National Recreation Area during the internal scoping meeting and the public identified issues during the public scoping process, including the three public meetings. Table ES-1 details the issues that were discussed and analyzed in the plan/EIS.

TABLE ES-1: ISSUES AND IMPACT TOPICS

Issue	Reason for Analysis
Soils	<p>Impacts on soils from ORV use have occurred and continue to occur in the designated area of Rosita, particularly between the entrance and Bull Taco Hill. Extensive soil erosion has occurred over the last 40 years, primarily due to the use of ORVs above the 3,000-foot elevation line. On hillsides with slopes of 15 degrees or more, soils often erode during and after rainfall events because of the steep slopes and the removal of vegetation by ORV use.</p> <p>In addition, this event generally continues through rainstorms, and the potential for damage to geologic resources increases considerably. The soils at the Blue Creek ORV use area remain in better condition than at Rosita Flats due to greater ranger presence and the rangers' ability to control ORV use and the associated impacts on hillsides and slopes. However, the potential for ORV use to impact geologic resources in the Blue Creek area remains, especially if such use increases or occurs outside designated routes or areas.</p>
Vegetation	<p>Use of ORVs in the Blue Creek and Rosita Flats areas has caused severe damage to plant communities, as documented in several planning documents and resource studies at Lake Meredith. At the Blue Creek ORV use area, ORV tracks parallel and cross Big Blue Creek several times, cutting through adjacent vegetation. Damage in the Rosita Flats area is extensive, both in geographic area and in the types of effects on the natural communities. Riparian area trees, including cottonwoods and tall grasses, have also been impacted by having their roots exposed by ORV traffic. Invasive species are a potential threat to the native vegetation communities of the national recreation area. Thirty-seven nonnative species have been documented in the national recreation area, 10 of which have been classified as "highly invasive" and are displacing native species and 8 of which are classified as "invasive and potentially problematic." Because ORVs have been found to spread the seeds of invasive species, this issue is addressed in the plan/EIS.</p>
Water Resources	<p>Lake Meredith National Recreation Area contains important water resources, including the surface of the lake and tributaries and groundwater in various aquifers beneath the national recreation area. The primary drainage in and out of the lake is the Canadian River, much of which flows underground. For drinking water supply, Lake Meredith water is blended with wellfield water from the Ogallala aquifer. The Blue Creek and Rosita Flats ORV use areas contain water features including rivers and streams. Current management allows the operation of vehicles within and adjacent to portions of Big Blue Creek, the Canadian River, and Bonita Creek. ORV use in riparian areas could impact water quality because of increased soil erosion, vehicle fluid leakage, and discarded trash, which could result in pollutants entering surface or groundwater resources.</p>
Soundscapes and the Acoustic Environment	<p>Impacts related to soundscapes could occur where ORVs are allowed in Rosita Flats or Blue Creek. A wide variety of ORV use occurs at the national recreation area (trucks, ORVs, utility terrain vehicles (UTVs), dune buggies, rock climbers, etc.), each emitting various levels of noise. Vehicular noise has the potential to impact other users in these areas, such as those camping, enjoying picnics with their families, or participating in other activities. ORV noise could also discourage wildlife from using these areas.</p>

Issue	Reason for Analysis
Wildlife and Wildlife Habitat	<p>Lake Meredith National Recreation Area provides important habitat for wildlife in the region, especially water-dependent species. Reservoirs, playa lakes, and the river systems are used as important stopover points for birds during migration. Common mammals known to live in and around the national recreation area include mule deer, white-tailed deer, coyotes, porcupines, raccoons, skunks, ground squirrels, rabbits, pocket gophers, moles, a few bat species, and several varieties of rats and mice. Pronghorn antelope may occasionally stray into the area, but are primarily found in the flatter topography in upland prairies away from the Canadian River. Prominent birdlife consists of wild turkeys, northern bobwhites, scaled quail, mourning doves, greater roadrunners, and red-winged blackbirds. The national recreation area lies along the Central Flyway, which is a major north–south bird migration route located between the arid region to the west and the moister landscapes to the east. Large numbers of ducks, geese, and other migratory birds come to use open water areas as well as wetland areas during the fall through spring months. Turtles, lizards, frogs, and snakes, including two poisonous species (prairie rattlesnake and western diamondback rattlesnake), can be found in the national recreation area. Extensive ORV use at the national recreation area has resulted in the loss of a considerable amount of ground vegetation, which is important to support native wildlife such as birds, deer, and mice. ORV use also has the potential to cause impacts on wildlife as a result of vehicle noise, which contributes to species disturbance or displacement, and habitat damage caused by vehicle use outside of permitted areas and within the riverbed in the Rosita ORV use area.</p>
Threatened and Endangered Species/Species of Concern	<p>Habitat for federally threatened and endangered species, such as the Arkansas River shiner (<i>Notropis girardi</i>), may be vulnerable to disturbances caused by recreational uses, including ORV use. Current and possible future management alternatives for ORV and other recreational uses would take into consideration the needs of federally listed threatened and endangered species, as well as species of concern, in determining management measures.</p>
Archeological Resources	<p>Due to its use as a major trade route, the Canadian River and its tributaries were a major focal point for prehistoric and historic activities, as demonstrated by a high density of sites located on the uplands, side drainages, and tributary drainages of the river. Archeological surveys conducted in the Rosita Flats area as part of a plan for prescribed burns in 2005 identified six archeological sites. ORV use has the potential to expose and disturb archeological sites through the erosion that can result from tire ruts and other ORV use. Because of known archeological sites in the Rosita Flats area and the potential for unknown sites in this area and in Blue Creek, impacts on archeological resources are analyzed in this plan/EIS.</p>
Visitor Use and Experience / Health and Safety	<p>ORV use has taken place at Rosita and Blue Creek since at least the 1950s and today this area is still popular with ORV enthusiasts. Because ORV use at the national recreation area is an integral component of the experience for some visitors, visitors may be affected by potential ORV management actions, especially if certain restrictions or user fees are involved. Visitors who do not use ORVs may also be impacted by ORV use, either through visitor conflicts or aesthetic/visitor experience issues. While there are no documented conflicts between ORV users, campers, fishermen, boaters, bird-watchers, and others, some public comments gathered through the public scoping process indicate visitors are concerned for their safety in ORV use areas, particularly due to speeding vehicles, reckless driving, and crime.</p>
Lake Meredith National Recreation Area Management and Operations	<p>The NPS manages natural and cultural resources, public recreation, and associated facilities in the national recreation area. The superintendent has overall authority and uses five divisions for managing the park unit: (1) resource management, (2) law enforcement and visitor protection, (3) facility management, (4) administration, and (5) interpretation. In addition to numerous other responsibilities, national recreation area staff members are charged with enforcing closures, monitoring motorized vehicle use for general violations, and providing interpretive and educational information to visitors. The implementation of additional management measures or regulations associated with this plan/EIS has the potential to impact the day-to-day operations and management of Lake Meredith National Recreation Area.</p>

ALTERNATIVES

The National Environmental Policy Act (NEPA) requires federal agencies to explore a range of reasonable alternatives that address the purpose of and need for the action. The alternatives under consideration must include the “no action” alternative as prescribed by 40 CFR 1502.14. Action alternatives may originate from the proponent agency, local government officials, or members of the public at public meetings or during the early stages of project development. Alternatives may also be developed in response to comments from coordinating or cooperating agencies.

The alternatives analyzed in this document, in accordance with NEPA, are the result of internal and public scoping. These alternatives meet the management objectives of the national recreation area while also meeting the overall purpose of and need for the proposed action. Alternative elements that were considered but were not technically or economically feasible, did not meet the purpose of and need of the project, created unnecessary or excessive adverse impacts on resources, and/or conflicted with the overall management of the national recreation area or its resources were dismissed from further analysis.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following describes alternative elements common to all alternatives, including the no-action alternative.

Operator/Vehicle Requirements

Vehicles operating in any ORV use area of the national recreation area must have an ORV use decal, per Texas state law.

ATV-specific operator and vehicle requirements, per Texas state law, include the following:

- ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation.
- ATV operators must possess valid safety certificates issued by the state of Texas under Section 663.031 of the Texas Transportation Code.
- ATV operators under the age of 14 must be accompanied by a parent or guardian.
- ATV operators may not carry passengers unless the vehicle is designed by the manufacturer for carrying a passenger.

National Park Service Regulations

Title 36 of the CFR, “Parks, Forests, and Public Properties,” is applicable in all national park units, including Lake Meredith National Recreation Area. These regulations include those in Title 36 applicable to the operation of ORVs in the park and those applicable to individuals visiting the park. Of particular note are the provisions of 36 CFR 1.5 and 1.6, which state that the superintendent may impose public use limits or may close all of the park or a portion of a park area to all public use or to a specific use or activity; may designate areas for a specific use or activity; may impose conditions or restrictions on a use or activity; and may establish a permit, registration, or reservation system.

Superintendent's Compendium

The provisions detailed in the Superintendent's Compendium define recreation area-specific regulations imposed under the discretionary authority of the superintendent of the recreation area. These provisions, as described below, are common to all alternatives, and may vary annually as the contents of the compendium change.

Campfires

The Superintendent's Compendium would continue to regulate camping-related activities, such as campfires, with additional restrictions during high fire-danger times (bans in Rosita Flats and Blue Creek follow county bans).

Education and Outreach

Under all alternatives, the park would continue to

- Provide a bulletin board at Blue Creek and Rosita Flats with campground rules and regulations and other national recreation area information
- Provide education through visitor contact with rangers, maintenance staff, and other national recreation area staff, and through on-site educational opportunities
- Provide trash bags to visitors on busy weekends
- Develop a bulletin on ORV use areas and regulations, available at the national recreation area headquarters and at ranger stations (this information would also be displayed on the Blue Creek and Rosita Flats bulletin boards on a larger scale).

NO-ACTION ALTERNATIVE

The Council on Environmental Quality (CEQ) requires that the alternatives analysis in an environmental impact statement (EIS) "include the alternative of no action" (40 CFR 1502.14[d]). The no-action alternative is developed for two reasons. First, a no-action alternative may represent the agency's past and current actions or inaction on an issue continued into the future, which may represent a viable alternative for meeting the agency's purpose and need. Second, a no-action alternative may serve to set a baseline of existing impacts against which to compare the impacts of the action alternatives.

Under alternative A (no action), the national recreation area would continue to manage ORV use at Rosita Flats and Blue Creek per the 2007 *Interim OHV Use Plan*, as well as through the regulations contained in 36 CFR 7.57 and the Superintendent's Compendium as authorized under the national recreation area's special regulation at 36 CFR 7.57. This alternative would maintain the ORV use areas at Blue Creek, along the creek bottom, officially known as "cutbank to cutbank" and at Rosita Flats below the 3,000-foot elevation line. No specific ORV routes would be established in either ORV use area.

User and operator requirements described under "Elements Common to All Alternatives" would continue to be implemented and enforced. There would also continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek. There would be no established speed limits for ORV use in Rosita Flats or Blue Creek other than those on park roads as established in the CFR.

Alternative A would include camping opportunities throughout Rosita Flats and Blue Creek. There are currently no officially designated camping areas at either site, and camping could occur anywhere the

visitor can access. Campfires would continue to be regulated under the Superintendent's Compendium, and could be restricted further during times of high fire danger, which follow when county burn bans are in effect. Existing amenities in these areas, such as picnic tables and trash receptacles, as well as pit toilets at Blue Creek, would be maintained, but none would be added.

The national recreation area would continue to provide waste disposal services at Blue Creek and Rosita Flats at the same frequency as under current conditions. At Blue Creek, trash pickup would occur on a daily basis from mid-April to September and as needed, typically two to three times per week, from October to April. At Rosita Flats, trash pickup would occur once a week year-round.

Rules and regulations related to ORV use at Rosita Flats and Blue Creek would be enforced by park law enforcement officers. Current methods of enforcement that would continue include patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. During high visitor-use times or special events, the NPS may coordinate with other agencies in the area for additional law enforcement support.

No additional ORV management measures, such as establishment of user zones, use limits, or a permit system (beyond what is already required by the state), would be established.

Interpretation services would not be provided in Rosita Flats and Blue Creek. Additional education, research, and monitoring would occur, as described under "Elements Common to All Alternatives."

ACTION ALTERNATIVES

Elements that are common to all action alternatives include the following:

Operator/Vehicle Requirements—Additional operator/vehicle requirements would be implemented and would include the following:

- All ORVs would be required to have a functioning muffler system, a qualified spark arrester (ATVs only), and functioning headlights and taillights. If a vehicle does not have functioning headlights or taillights, it would be permitted to operate during the day, but not after dark.
- Vehicle mufflers on ORVs that allow more than 96 decibels of sound would be prohibited. Noise levels would be measured 20 inches from the vehicle exhaust, pursuant to the SAE J1287 standard.
- All ATVs would be required to have a triangular orange flag on top of an 8-foot pole attached to the back of the vehicle.
- All ORVs would be required to display lighted headlights and taillights after dark.

Waste Disposal—The NPS would continue to provide waste disposal services at Blue Creek and Rosita Flats and would develop new educational programs/materials for clarifying issues such as proper waste disposal techniques.

Hours of Vehicle Operation—Under the action alternatives, there would continue to be no limitation on the operating hours of vehicles in Rosita Flats and Blue Creek, except for in the designated camping areas, where non-registered motorized vehicles (such as ATVs/UTVs, dune buggies, etc.) would be prohibited from operating between 10:00 p.m. and 6:00 a.m. Visitors would be able to use their vehicles to access their camping site entrances and exits, but otherwise, quiet hours in campground areas would be between 10:00 p.m. and 6:00 a.m.

Glass Bottle Ban—All action alternatives would include a glass bottle ban in the Rosita Flats and Blue Creek ORV use areas.

Speed Limits—Speed limits in Rosita Flats and Blue Creek would be 35 miles per hour (mph) on designated routes and areas, on sandy bottom flats the speed limit would be 55 mph, and in designated camping areas the speed limit would be 15 mph.

Temporary Route and Area Closures—The Superintendent may temporarily close ORV routes and areas if resource conditions warrant. This could include closing areas that become overly rutted or closing an area after heavy rains to prevent resource damage. Once the resource condition has been corrected or conditions improve, the area would be reopened to ORV use.

Arkansas River Shiner Protection Measures

Under the action alternatives, the national recreation area would take additional steps to ensure the protection of the Arkansas River shiner. These include, but are not limited to, the following:

- Parking or staging of vehicles of any kind would be confined to areas outside the wetted channel of the Canadian River.
- ORV use within park boundaries would be restricted to designated routes. Access to the river would be allowed only from designated access points.
- ORV use zones would be established in Rosita Flats in two areas currently devoid of vegetation. One is south of the Canadian River and the other is east of Bull Taco Hill. Outside of these areas, ORVs would be permitted only on designated, marked routes. ORVs may access the riverbed area only from marked and designated access points off the designated ORV routes (alternative D only).
- A resource protection zone of approximately 1,040 acres would be established north and east of the Bull Taco Hill ORV use area to protect vegetation and reduce soil erosion. This zone would permit only vehicles with a wheel width of 64 inches or less (applies to alternatives B and D only).
- Every two to four years, aerial photography would be used to determine if use is occurring outside of designated routes and areas.
- Educational materials would be provided when the visitor receives a permit (either with cost or at no cost, depending on the alternative). Educational messages would include information about the prohibition of driving in isolated pools or entering and leaving the river at undesignated access points, as well as other information about the Arkansas River shiner. These materials could also contain the statement, “The U.S. Fish and Wildlife Service recommends during low water that ORV users do not drive in the river or isolated pools but may cross the channel when needed.”

Isolated pools are areas of water that have no connectivity between them, thus no flow entering or leaving the pool.

- Four to six times per week, on-the-ground NPS law enforcement would patrol and monitor for prohibited driving in isolated pools and the wetted channel, as well as other ORV violations. Monitoring for incidental take of Arkansas River shiner would occur at this time. Additional law enforcement patrols may occur as funding from ORV permits becomes available under the various alternatives.

- The national recreation area would monitor the shiner population every three to five years to ensure that additional management is not necessary.
- The superintendent always retains the authority to close any portion of the national recreation area for protection of park resources.
- The NPS shall develop and implement an appropriate monitoring plan for reporting progress in development of the property and implementation of the reasonable and prudent measures. Population monitoring for the Arkansas River shiner would occur every three to five years, as funding permits. The content, schedule, and format of the monitoring plan would be at the discretion of the NPS, but would take place no less than once every five years.
- The NPS would provide sufficient guidance to its employees and contracted employees to minimize incidental take and to ensure compliance with the terms and conditions of the biological opinion (USFWS 2014).
- Additional educational materials concerning Arkansas River shiner protection could be provided on existing park bulletin boards and any boards or kiosks added to campground areas to further awareness of Arkansas River shiner conservation.

Cultural Resource Protection—Archeological resources in ORV routes or areas would be protected and access to these resources would be restricted. Should additional resources be discovered within ORV routes or areas, the resources would also be protected from ORV use.

Education and Outreach

The current education and interpretation efforts related to ORV use at Blue Creek would be expanded under all action alternatives to also include

- Providing literature and trash bags to users. Literature would contain basic safety messages (speed limits, etc). ATV rules and other national recreation area rules could be printed directly on the trash bags. NPS field staff would visit each campsite to provide this information and increase visitor contacts.
- Providing ATV safety programs in schools, including more education about ORV use at community events the national recreation area staff attends, such as the Howdy Neighbor Day in Fritch.
- Including ORV education when providing information at the annual Water Safety Day program.
- Providing information containing Lake Meredith National Recreation Area ORV use area maps and rules to local retail establishments for display.
- Increasing the number of educational signs in ORV use areas and increasing patrols.
- Establishing a volunteer group to assist with cleanup and other efforts.
- Continuing to work with Texas Off-road Association on additional outreach efforts.
- Developing “tread lightly” pamphlets for ORV use.

Research and Monitoring

Under all action alternatives, national recreation area staff would monitor ORV use areas to identify ORV use outside designated routes and areas. National recreation area staff would monitor ORV use on the ground throughout the year and close visitor-created ORV routes and areas by using physical barriers,

signs, etc., as appropriate. During monitoring, national recreation area staff would look for new trails and new signs of disturbance, including broken fence lines. Monitoring would also include a review of law enforcement records to determine how many citations are being issued for off-trail use.

Additional monitoring would be done by aerial photography. Photos would be taken of both ORV use areas every two to four years, depending on funding. National recreation area staff would use these aerial photographs to identify ORV use occurring outside designated routes and areas. National recreation area staff would provide physical barriers, signs, etc., as appropriate to prohibit ORV use on any new visitor-created routes. Additional patrols would likely resume as well.

User Capacity

The NPS defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors but on where visitors go, and what they do. In managing user capacity, the NPS employs a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires an adaptive approach to user capacity management.

The ongoing GMP effort for Lake Meredith National Recreation Area and Alibates Flint Quarry National Monument establishes parkwide user capacity program. This program includes indicators and standards for ORV use areas in Lake Meredith National Recreation Area. Indicators and standards are measurable features that are monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the NPS ensure that desired conditions are being met.

Table ES-2 includes the indicators, standards, and potential future management strategies that could be implemented in the ORV use areas. After the most appropriate indicators were identified, standards that represent the minimum acceptable condition for each indicator were assigned. The standards incorporate qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. If ORV use levels and patterns change appreciably, NPS staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes— Under alternative B the national recreation area would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to be in conflict with one another. At Rosita Flats, two areas would be established as an ORV “area” and open to ORV use: 1) the area south of the river (currently denuded) and 2) the area east of Bull Taco hill. Access to the riverbed from the ORV use area south of the river would be from designated access points only. Outside of the two ORV use areas, ORV use would only be allowed on designated, marked routes. At Blue Creek, ORVs would only be allowed on sandy bottom areas and designated routes, with ORV use prohibited on vegetated areas. Alternative B would also institute a zoning system that would be a “layer” on top of these routes and areas, further managing use. Established zones could include camping only, hunting, resource protection, low-speed, and beginner.

**TABLE ES-2: SUMMARY OF USER CAPACITY INDICATORS,
STANDARDS, AND POTENTIAL MANAGEMENT STRATEGIES APPLICABLE TO ORV USE AREAS**

Indicator	Zone	Standard	Management Strategies
Number of breaches to the designated boundary per month	ORV Semi-primitive	No more than six breaches of designated ORV boundary per month	Educate users on impacts of leaving designated ORV use areas Remotely monitor trails (for example, with cameras) Require permits Implement temporary closures
Change in campsite condition class	Developed ORV Rural Semi-primitive	No less than 15% above condition class 4 based on site condition assessment (to be measured annually)	Educate visitors in a program that includes the use of designated sites and the prohibition on camping outside designated areas; tools could include flyers, press releases, public events such as with hunters, and information postings at the visitor contact station and on waysides Mark designated campsites, survey with global positioning system equipment, and incorporate the results in the geographic information system to provide a baseline Increase enforcement
Number of incidences of camping outside designated areas	Developed ORV Rural Semi-primitive	Zero tolerance for camping in undesignated areas	Same as strategies for change in campsite condition class
Number of ticketed incidents related to damage of park resources per six-month period	Park-wide	No more than one ticketed violations related to park resources per six-month period	Provide pre-incident education Increase patrols based on locations of incidents / increase number of signs Implement more intensive mitigation measures based on resource impacted, such as applying coating that prevents graffiti from sticking, or rerouting trails Close facilities or areas if incidents continue
Number of incidences of vehicles traveling outside the designated road or route	Cultural Developed ORV Rural	Three informal roads within 0.5 mile of designated road or route	Educate visitors to increase awareness of the impacts associated with travelling on undesignated roads Increase number of signs, with carsonite poles Increase the number of patrols Close area to mitigate resource damage Physical damage and productivity

Alternative C: Management through Use of a Permit System at Current ORV Use Areas—Under alternative C, the national recreation area would manage ORV use through a permit system as well as through the establishment of use limits. Permits would include a fee and initially there would be no limit on the number of permits issued. ORV routes and areas would be the same as those under alternative B, except that there would be one designated ORV use area in Rosita Flats, instead of two.

Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas—Under alternative D the park would, in part, base the designation of routes and areas on a zoning system, with one of the purposes being the separation of visitor uses that have the potential to conflict with one another, similar to the system under alternative B. In addition, a fee permit system would be instituted that would allow the national recreation area to provide additional enforcement and amenities in the ORV use area but would not establish use limits. Management would include designating routes and areas, zones, and the permit system.

ENVIRONMENTAL CONSEQUENCES

Impacts of the alternatives were assessed in accordance with NPS Director's Order 12 and Handbook: Conservation Planning, Environmental Impact Analysis and Decision-Making. This handbook requires that impacts on park resources be analyzed in terms of their context, duration, and intensity. The analysis provides the public and decision-makers with an understanding of the implications of ORV management actions in the short and long term, cumulatively, and in context, based on an understanding and interpretation by resource professionals and specialists.

For each impact topic, methods were identified to measure the change in the park's resources that would occur with the implementation of each management alternative. Intensity definitions were established for each impact topic to help understand the severity and magnitude of changes in resource conditions, both adverse and beneficial.

Each management alternative was compared to baseline conditions (Alternative A: No Action – Continuation of Current Management) to determine the context, duration, and intensity of resource impacts.

The elements of all four alternatives are detailed in table ES-3. Table ES-4 details how each of these alternatives meets the objectives of the plan/EIS. Table ES-5 summarizes the results of the impact analysis for the impact topics that were assessed.

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TABLE ES-3: ALTERNATIVE ELEMENTS SUMMARY

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative A: No Action – Continuation of Current Management	Continuation of management by the 2007 <i>Interim OHV Use Plan</i> and regulations contained in the Superintendent's Compendium.	ORV use permitted at two designated areas: Rosita Flats—use authorized below the 3,000-foot elevation line. Blue Creek—use authorized in and along the creek bottom (cutbank to cutbank).	ORVs permitted in two areas in the national recreation area (Rosita Flats and Blue Creek)—in those areas, no separation of visitor uses.	No NPS vehicle permit required to operate an ORV at Rosita or Blue Creek ORV use area. A decal would be required by the state for all motorized vehicles, but not administered by the national recreation area.	No use limits in designated ORV use areas.	No limitations on the times when vehicles can operate in Rosita Flats and Blue Creek ORV use areas.	Each ATV user younger than 14 must be accompanied by a parent or guardian. ORVs may not carry passengers unless the ORV is designed by the manufacturer for carrying passengers.	All ATV operators must wear eye protection and helmets approved by the Texas Department of Transportation. Each ATV operator must possess a valid safety certificate issued by the state of Texas under Section 663.031 of the Texas Transportation Code.	No speed limits other than on national recreation area roads, as established in the CFR.	No interpretation provided at Rosita Flats or Blue Creek. Bulletin boards with campground rules and regulations and other national recreation area information located at Blue Creek and Rosita Flats. Education through visitor contact with rangers, maintenance staff, other national recreation area staff, and on-site educational opportunities. Trash bags provided on busy weekends. A site bulletin regarding ORV use at headquarters and at ranger station, and also at the Blue Creek and Rosita Flats bulletin boards on a larger scale. The bulletin boards are currently out of date.	Camping permitted at Rosita Flats and Blue Creek, without designated camping areas. Campfires regulated under the Superintendent's Compendium. Further restrictions in place during high fire-danger times (following the county burn bans). Amenities provided: Blue Creek: picnic tables, trash receptacles, pit toilets. Rosita Flats: picnic tables, trash receptacles (at entrance).	Blue Creek: Trash pickup from mid-April to September on a daily basis and as needed (two to three times per week) from October to April. Rosita Flats: Trash pickup once per week.	Rules and regulations related to ORV use at Rosita Flats and Blue Creek enforced by national recreation area law enforcement officers. Continuation of current methods of enforcement, including patrolling Rosita Flats, with more frequent patrols at Blue Creek due to the remote nature of Rosita Flats. Interagency law enforcement at large events.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Create zones in Rosita Flats and Blue Creek for various uses. In addition, implement a permit system for educational purposes that would be easy for the visitor to obtain and at no cost.	<p>ORV use permitted at Blue Creek.</p> <p>The use area at Blue Creek redefined as</p> <ul style="list-style-type: none"> • ORVs would only be allowed on sandy bottom areas and designated routes (figures 6 and 7 in the “Description of the Action Alternatives”) section. • ORV use prohibited on vegetation. • Designated routes and camping areas marked by carsonite posts. <p>ORV use permitted at Rosita Flats and redefined as</p> <ul style="list-style-type: none"> • Area south of river (currently denuded) open to ORV use, with no designated access points to the riverbed area. • Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. <p>Zoning system applied as a “layer” to these use areas, as described in the next column.</p>	<p>Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include</p> <ul style="list-style-type: none"> • ORV routes/areas. • Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the “Description of the Action Alternatives” section. • Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months). • New low-speed, beginner zone at loop in Rosita Flats area. • At Blue Creek a new low-speed zone for family use on either side of the Farm to Market (FM) 1913 bridge (see speed limits). • A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted. 	<p>No-cost educational permit required for access to ORV use areas.</p> <p>Same permit for both ORV use areas. No limit on the number of permits issued. Permit could be obtained easily (i.e., online, at the visitor’s center, and at local shops, like existing boat permits), or from rangers in the field.</p> <p>Permit would consist of a piece of paper or brochure and would contain ORV regulations and information. The permit would need to be signed by the operator and kept in the vehicle.</p>	Same as alternative A.	<p>No operation of non-registered motorized vehicles in designated campground zones/areas 10:00 p.m.–6:00 a.m.</p> <p>All ORVs must display lighted headlights and taillights after dark.</p>	<p>Same as alternative A, plus:</p> <p>All ORVs must have a muffler, spark arrester, and functioning headlights and taillights.</p> <p>Muffler requirements—96 decibel limit for ORVs. Park rangers to use decibel meters to measure.</p>	<p>Same as alternative A, plus:</p> <p>All ATVs must have a triangular orange flag on top of an 8-foot pole attached to the back of the ATV.</p>	<p>Speed limit of 15 mph in camping-only zones.</p> <p>Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see “zone system” column).</p> <p>In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).</p>	<p>Same as alternative A, plus:</p> <ul style="list-style-type: none"> • Provide safety literature and trash bags to users. ORV and other rules could be printed on the trash bags. Rangers seek out visitors and provide this information and increase visitor contacts. • Provide ORV safety programs in schools and attend Fritch Howdy Neighbor Day. • Increase education about ORVs at community events the national recreation area staff attends. • Add ORV education to Water Safety Day. • Provide signs to local businesses containing Lake Meredith National Recreation Area ORV use area map and rules. • Increase educational signs in ORV use areas. • Establish a volunteer group to assist with cleanup and other efforts. • Develop “tread lightly” pamphlet for ORV use. 	<p>Designated camping zones with lower speed limit.</p> <p>Picnic tables and fire pits in these areas as funding allows (not funded through the permit system).</p> <p>No camping in designated ORV routes or areas.</p> <p>No additional amenities provided beyond alternative A (except for designated camping areas).</p>	<p>Same as alternative A, plus:</p> <p>Add waste management issues to educational components.</p>	<p>Law enforcement staff levels increased.</p> <p>ORV use outside designated routes and areas could cause routes/areas to close temporarily.</p> <p>Post signs prohibiting ORV use in areas of isolated pools during times of drought.</p>

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Manage ORV use (including level of use) with a permit system with a fee at Rosita Flats and Blue Creek. Develop a monitoring plan and criteria for use limits.	Blue Creek: Same as alternative B. Rosita Flats: Same as alternative B, except there is no designated ORV use area east of Bull Taco Hill.	Same as alternative A.	Fee permit required to access the ORV use areas. Price structure consistent with boat permits. Permits available for \$4/day, \$10/three days, and \$40/year. Same permit for both ORV use areas. Potential for limits on number of permits based on results of use limit studies. Permits available via mail, at headquarters, online, or at other vendors. A kiosk and “Iron Ranger” could be used to supply daily permits. Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer). Provide permit holders with a Lake Meredith National Recreation Area ORV regulations brochure.	Develop use limits based on indicators and standards developed through the GMP planning process. Criteria developed and monitored to determine when the use limit is reached. Develop monitoring plan to describe these studies and how the implementation of use limits would be achieved.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B.	Same as alternative B, plus: interpretive wayside program starting at Blue Creek and expanding as necessary. Cost of program covered by permit fee.	Designated camping areas with lower speed limits would be established for tent and vehicle camping. Establish fire pits and designated campsites using funds from permit fees. No camping on designated ORV routes. Outside designated camping areas, tent camping would be permitted in areas that have no vegetation or previously disturbed vegetation. Visitors in these areas would be required to walk into their campsites because vehicles must be parked off vegetation along designated ORV routes or areas. Pit toilets, fire rings, and picnic tables in the designated camping areas would be provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.	Same as alternative B.	Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees. Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area. Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors. Aerial imagery to track new visitor-created routes/ noncompliance. ORV use outside designated routes and areas could cause routes/areas to close temporarily.

Alternative	Brief Alternative Description	Designated Vehicle Routes/Areas – Land Management	Zone System (separation of visitor uses)	Permit Requirements	Use Limits	Hours of Vehicle Operation	Vehicle Requirements	Equipment Requirements	Speed Limits	Education/ Outreach Component	Camping, Campfires, and Other Amenities	Waste Disposal	Monitoring and Enforcement
Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas	Develop a permit system with a fee to allow NPS to provide additional amenities and increase enforcement in the two ORV use areas. No user capacity established.	<p>ORV use permitted at Blue Creek as described under alternative B.</p> <p>ORV use permitted at Rosita Flats and redefined as</p> <ul style="list-style-type: none">• Area south of river (currently denuded) open to ORV use. Designated access points to the riverbed area would be established.• Area east of Bull Taco Hill open to ORV use.• Other ORV use (outside the area described above) allowed only on designated, marked routes. ORVs could access the riverbed area only from marked and designated access points off designated ORV routes. Driving on vegetation prohibited. <p>A zoning system would be applied as a “layer” to these use areas, as described in the next column.</p>	<p>Establish a zone system in Blue Creek and Rosita Flats ORV use areas to provide for a separation of visitor uses. Zones include</p> <ul style="list-style-type: none">• ORV routes/areas.• Camping-only zones with vehicle access provided to the area but no recreational vehicle use allowed. Speeds limited to 15 mph within camping-only zones. Camping-only zones are shown on figures 6 and 7 in the “Description of the Action Alternatives” section.• Designated hunting areas zoned for an ORV closure during rifle season (would not apply to ORV use for hunting). On average, these closures would last two to eight weeks (up to two months).• New low-speed, beginner zone at loop in Rosita Flats area.• At Blue Creek a new low-speed zone for family use on either side of the FM 1913 bridge (see speed limits).• A resource protection zone in Rosita Flats where vehicles with a wheel width greater than 64 inches would not be permitted.	<p>Fee permit required to access the ORV use areas.</p> <p>Price based on consistency with boat permits.</p> <p>Permits available for \$4/day, \$10/three days, and \$40/year.</p> <p>Same permit for both ORV use areas.</p> <p>Permits available via mail, at headquarters, online, or at other vendors. A kiosk and “Iron Ranger” could be used supply daily permits.</p> <p>Permit would take the form of a bumper sticker on the ORV (even those brought in by trailer).</p> <p>Permit holders would also receive a Lake Meredith National Recreation Area ORV regulations brochure.</p>	Same as alternative A.	Same as alternative B.	Same as alternative B.	Same as alternative B.	<p>Speed limit of 15 mph in camping-only zones.</p> <p>Outside these areas, a speed limit of 35 mph on all ORV routes and 55 mph on sandy bottom flats. A lower speed limit (could be 15 mph) within sight of the bridge at Blue Creek (about a half mile in either direction)—signs painted on bridge pillars (creates a low-speed use zone for families to play in the water; see “zone system” column).</p> <p>In Rosita Flats, provide a lower speed limit for beginner loop (less than 20 mph).</p>	<p>Same as alternative B, plus: Install fencing and signs around ORV use boundary at Rosita Flats to better define ORV use in this area.</p>	<p>Designated camping zones with lower speed limit.</p> <p>Picnic tables and fire pits as funding allows (through the permit system) in these areas.</p> <p>No camping in designated ORV routes or areas.</p> <p>Pit toilets, fire rings, and picnic tables in the designated camping zones provided, on a phased basis. While these would be the priority, other amenities could include shade shelters, emergency call stations, and additional kiosks and bulletin boards for more information.</p>	Same as alternative B.	<p>Law enforcement staff levels increased and additional law enforcement resources provided using funds from permit fees.</p> <p>Explore options for having law enforcement staff located closer to the Rosita Flats ORV use area.</p> <p>Develop a monitoring plan that looks at vegetation, erosion, and other predetermined factors.</p> <p>Aerial imagery to track new visitor-created routes/ noncompliance.</p> <p>ORV use outside designated routes and areas could cause routes/areas to close temporarily.</p>

TABLE ES-4: ANALYSIS OF HOW ALTERNATIVES MEET OBJECTIVES

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Safety				
Manage ORV use to minimize conflicts among different ORV users.	Does not meet this objective because there would be no separation of uses (e.g., camping) in the ORV use areas, no established ORV routes, and no speed limits. Visitors with varying skills, interests, and expectations would use the areas together.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speed. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts.	Meets this objective to a large degree by designating ORV routes in both Blue Creek and Rosita Flats. Establishes designated camping areas, improves visitor amenities, and could provide “camp hosts” to assist visitors. An ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. If conditions warrant, a use limit could be implemented.	Fully meets this objective by establishing routes for ORV use in both Blue Creek and Rosita Flats. Camping-only zones would be designated, with reduced ORV speeds. Low-speed and beginner zones would also be designated to provide areas for riders of specific skill levels. Recreational ORV use would be prohibited during hunting season. These options would separate users, allow increased variety of ORV use, and eliminate the recreational ORV / hunting conflict; a revocable ORV permit would increase the NPS's ability to manage for inappropriate use and could result in reduced visitor conflicts. In addition, an ORV permit would increase NPS ability to manage for inappropriate use, and could result in reduced visitor conflict.
Promote the safe operation of ORVs and safety of all visitors.	Meets this objective to some degree by requiring standard rider protection, Texas safety certification, and parental presence for young riders. However, alternative A would not implement speed limits, riders of varying skill level would not be separated, and there would be no requirements for safety items on ORVs.	Fully meets this objective by implementing measures common to alternatives B, C, and D, separating users of various skill levels, establishing speed limits and use zones, and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.	Meets this objective to a large degree by implementing measures common to alternatives B, C, and D; camping and riding areas would be separated; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area; and visitor capacity could be established if conditions warrant.	Fully meets this objective by implementing measures common to alternatives B, C, and D; separating users of various skill levels; establishing speed limits and use zones; and requiring safety items on ORVs and riders. Camping and riding areas would be separated, and recreational ORV use would not be allowed in hunting areas during hunting season; an ORV permit would allow the NPS to better manage unsafe uses in the national recreation area.
Management				
Build stewardship through public awareness and understanding of NPS resource management and visitor use policy and responsibilities as they pertain to the national recreation area and ORV management.	Meets this objective to some degree by continuing NPS education, interpretation, and enforcement in the ORV use areas.	Meets this objective to a moderate degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. Establishes resource protection zones that would reduce impacts on vegetation and soils and fence ORV use areas, which would reduce impacts on wildlife.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.	Meets this objective to a large degree by increasing education and outreach regarding ORV safety and resource protection, increasing signs in the national recreation area, and establishing a volunteer group to assist with ORV use area cleanup. The implementation of a permit system with an educational emphasis would also promote further understanding of national recreation area resources.
Natural Resources				
Minimize adverse impacts on threatened, endangered, and other protected species and their habitats.	Does not meet this objective because formal plans to reduce direct and indirect impacts on the Arkansas River shiner and its habitat would not be implemented.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.	Meets this objective to a large degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources (including threatened and endangered) to be identified in ongoing GMP process and would implement species protection measures outlined in the biological opinion.	Meets this objective to a large degree by establishing resource protection zones that would reduce impacts on vegetation and soils, indirectly benefiting the Arkansas River shiner by reducing erosion and impacts on water quality and through implementation of the measures outlined in the biological opinion. Restricting ORV traffic from isolated pools of water during drought would reduce direct impacts on the Arkansas River shiner and its habitat.
Define effective strategies for soil erosion control and the restoration of plant resources to support wildlife populations.	Does not meet this objective because no formal plans to reduce erosion or impacts on vegetation would be established.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORVs from vegetated areas, and clearly marking areas where ORV use is allowed.	Meets this objective to a moderate degree by allowing ORV travel only on sandy bottoms and designated routes in Blue Creek and confining ORVs to denuded areas and designated routes in Rosita Flats. Would establish a use limit based on desired conditions for resources to be identified in ongoing GMP process.	Meets this objective to a moderate degree by establishing resource protection zones, designating routes for a variety of ORV uses, restricting ORV from vegetated areas, and clearly marking areas where ORV use is allowed.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
National Recreation Area Operations				
Identify ORV plan implementation needs and costs.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Meets objective to a large degree. Through the ORV planning process, all costs for plan implementation would be identified.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee-permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.	Fully meets this objective. Through the ORV planning process, all costs for plan implementation would be identified. In addition, a fee permit system would allow for a level of cost recovery for administering ORV management at the national recreation area.
Minimize national recreation area operations and cost impacts as the result of implementing an ORV plan.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Does not meet this objective because ORV users would not pay fees to support services or restore damage done by ORV use.	Meets this objective to a large degree by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.	Fully meets this objective by implementing a fee structure to cover costs of ORV visitor amenities, resource monitoring, and restoration needs associated with ORV use.

TABLE ES-5: ENVIRONMENTAL IMPACT SUMMARY BY ALTERNATIVE

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Soils	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized major adverse impacts on soils. Incremental contributions to soil erosion would be most notable at the extreme edges of the cutbanks and the eastern extent of the Blue Creek ORV use area and at the edges of the Rosita Flats ORV use area. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term major adverse impacts of alternative A, would result in long-term moderate adverse cumulative impacts on soil resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from educational measures provide increased awareness and behavior modification among ORV users. Incremental contributions to soil erosion would result from the intensification of uses in certain areas, such as the proposed beginner zone and designated camping areas, and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative B, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in localized long-term moderate adverse impacts on soils. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses at certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in-only camping. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative C, would result in long-term moderate adverse cumulative impacts on soils.	Under alternative D, continued ORV use and management at Blue Creek and Rosita Flats would result in localized long-term minor to moderate impacts. There would also be long-term beneficial impacts on soils accruing from enhanced resource protection measures. Incremental contributions to soil erosion would result from intensification of uses in certain areas and would impact soils at those locations. However, this impact would potentially be mitigated by the establishment of no-camping zones around vegetated areas. The long-term minor adverse effects of past, present, and reasonably foreseeable future actions, when combined with the long-term minor to moderate adverse impacts of alternative D, would result in long-term minor to moderate adverse cumulative impacts on soils.
Vegetation	Localized short- and long-term moderate adverse effects on vegetation would occur under alternative A as a result of localized impacts, including damage to plants; erosion, which can result in further loss of vegetation; reduction in soil productivity, which can affect natural recovery; and the potential introduction or spread of nonnative plants. The parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the localized short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in localized long-term moderate adverse cumulative impacts on vegetation.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. These adverse impacts would occur in fewer vegetated areas under alternative B because more of the land would be closed to ORVs compared to under alternative A. The designation of ORV routes and areas would allow previously disturbed vegetated areas the opportunity to recover. As a result, there would be long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation would occur in areas open to ORV use. However, there would be impacts in fewer vegetated areas because several areas would be closed to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.	Localized short- and long-term minor adverse impacts on vegetation could occur in areas open to ORV use. However, impacts would occur in fewer vegetated areas because only designated routes and specific areas would be open to ORVs. Vegetation in these closed areas would have the opportunity to recover, resulting in long-term beneficial impacts on vegetation associated with closed routes and areas. In combination with the parkwide long-term minor to moderate adverse impacts of past, present, and reasonably foreseeable future actions, cumulative impacts on vegetation would be parkwide, long term, minor, and adverse.
Water Resources	Under alternative A, continued ORV use at Blue Creek and Rosita Flats would result in long-term localized moderate adverse impacts on water quality due to ongoing disturbances under current management that would continue to impact surface water quality in the ORV use areas. Sedimentation of surface waters in Lake Meredith would continue to result from the ongoing erosion of soils due to ORV use. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the long-term moderate adverse impacts of alternative A, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative B, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor to moderate adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative B, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative C, continued ORV use at Blue Creek and Rosita Flats would result in short- to long-term localized minor to moderate adverse impacts on water resources. Impacts on water quality would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be mitigated by the establishment of use restrictions such as hike-in -only camping. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor to moderate adverse impacts of alternative C, would result in long-term minor adverse cumulative impacts on water resources.	Under alternative D, continued ORV use at Blue Creek and Rosita Flats would result in short- and long-term localized minor adverse impacts on water resources. Incremental contributions to erosion and resulting sediment delivery to streams would result from the intensification of uses in certain areas and would impact water resources at those locations. However, this impact would potentially be offset by the establishment of zoning restrictions. The short- and long-term minor adverse and long-term beneficial effects of past, present, and reasonably foreseeable future actions, when combined with the short- to long-term minor adverse impacts of alternative D, would result in long-term minor adverse cumulative impacts on water resources.
Soundscapes and the Acoustic Environment	The effects of alternative A on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative A on soundscapes at Rosita Flats would be long term, moderate, and adverse. Cumulative impacts on soundscapes would be long term, minor to moderate, and adverse.	The effects of alternative B on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative B on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative C on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative C on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.	The effects of alternative D on soundscapes at Blue Creek would be long term, minor, and adverse. The effects of alternative D on soundscapes at Rosita Flats would be long term, minor, and adverse. Cumulative impacts on soundscapes would be long term, minor, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Wildlife and Wildlife Habitat	Localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat would result from species disturbance and displacement, habitat damage and fragmentation, and individual mortality. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to continued use of ORVs in the Rosita Flats and Blue Creek ORV use areas, impacts would be less than under alternative A as a result of increased resource management. The use of a zone system, including a resource protection zone, as well as restrictions on driving in isolated pools in times of drought, designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Therefore, overall impacts under alternative B would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although short- and long-term moderate adverse impacts on wildlife and wildlife habitat could occur due to the continued use of ORVs in the Blue Creek and Rosita Flats ORV use areas, the impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative C. The development of a monitoring plan and interpretive wayside program, the implementation of use limits and permitting system, the designation of ORV access points at the riverbed at Rosita Flats, and implementing other protection measures for the Arkansas River shiner (which would also benefit other species) would result in long-term beneficial impacts on wildlife and wildlife habitat at both ORV use areas. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term minor adverse impacts of alternative C, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.	Although the continued use of ORVs at Blue Creek and Rosita Flats would result in localized short- and long-term moderate adverse impacts on wildlife and wildlife habitat, impacts would be less than under alternative A due to increased resource management, resulting in short- and long-term minor adverse impacts under alternative D. The implementation of a zoning system and fee-based permitting system, as well as the enactment of resource protection rules, such as the headlight/taillight and muffler requirements and the prohibition on driving on vegetation, would result in long-term beneficial impacts on wildlife and wildlife habitat at the Blue Creek and Rosita Flats ORV use areas. Additional beneficial impacts would result from prohibitions on driving through isolated pools, establishing designed access point to the river, and implementing protection measures for the Arkansas River shiner (which would also benefit other species). Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor adverse impacts under alternative D, would result in long-term minor adverse and long-term beneficial cumulative impacts on wildlife and wildlife habitat.
Threatened and Endangered Species / Species of Concern	Under alternative A, short- and long-term moderate adverse effects on the Arkansas River shiner could occur as a result of localized impacts including disturbance, mortality, or damage to/loss of habitat. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the short- and long-term moderate adverse impacts from continued ORV use under alternative A, would result in long-term moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse impacts on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the use of a zone system, including a resource protection zone, as well as designating ORV access points at the riverbed and restrictions on driving in isolated pools in times of drought, and the other protection measures outlined in the biological opinion would help mitigate these adverse impacts on Arkansas River shiner habitat. Therefore, overall impacts under alternative B would be short and long term, minor to moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Short- and long-term moderate adverse effects on the Arkansas River shiner could occur in localized areas due to the continued use of ORVs in the Rosita Flats area. However, the implementation of use limits, a fee-based permit system, the designation of ORV access points at the riverbed, and increased resource management, as well as other protection measures resulting from the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the Arkansas River shiner and its associated habitat. Therefore, the overall impacts of implementing alternative C would be short and long term, minor, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor to moderate adverse cumulative impacts on the Arkansas River shiner.	Although the continued use of ORVs at Rosita Flats would result in short- and long-term moderate adverse impacts on the Arkansas River shiner in localized areas, impacts would be less than under alternative A due to increased resource management which would result in long-term beneficial impacts, but there would be long-term minor adverse impacts. The implementation of a zoning system and fee-based permit system as well as the resource protection measures that would be implemented as part of the biological opinion (USFWS 2014), would help mitigate the adverse impacts of ORV use on the shiner at Rosita Flats. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the overall short- and long-term minor to moderate adverse impacts under alternative D, would result in long-term minor to moderate adverse impacts on the Arkansas River shiner.
Archeological Resources	Alternative A would result in continued potential long-term major adverse impacts on archeological resources along or near open ORV use areas, routes, or access points. Cumulative impacts would be long term, major, and adverse.	Alternative B would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Measures would be implemented to restrict access to the sensitive areas. Cumulative impacts would be long term, minor to moderate, and adverse.	Alternative C would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points; where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.	Alternative D would result in long-term minor adverse potential impacts on archeological resources along or near open ORV areas, routes, or access points. Where sites do exist, they would be protected with access restrictions. Cumulative impacts would be long-term, minor to moderate, and adverse.

	Alternative A: No Action – Continuation of Current Management	Alternative B: Zone System – Separation of Visitor Uses, with a Permit for Educational Purposes	Alternative C: Management through Use of a Permit System at Current ORV Use Areas	Alternative D: Management through Use of a Zoning and Permitting System at Current ORV Use Areas
Visitor Use and Experience / Health and Safety	Under alternative A there would be no change to the current visitor use and experience, access, or recreational opportunities. The current safety risk of unregulated ORV use in the national recreation area would remain the same. As a result, impacts on visitor use and experience / health and safety would be long term, moderate, and adverse. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the long-term moderate adverse impacts under alternative A, would result in long-term minor to moderate adverse cumulative impacts on visitor use and experience / health and safety.	Although the establishment of zones and the implementation of a permit system would have adverse impacts for the majority of visitors by requiring visitors to obtain an ORV permit, beneficial impacts would result from the separation of visitor uses, improved safety, and enhanced resource conditions at the national recreation area. A minority of users would experience moderate adverse effects by loss of access to the resource protection zone and temporary loss of the hunting zone in Rosita Flats. Some users could experience long-term negligible to minor adverse impacts because the potential for user conflicts may arise with hunters not using ORVs in the hunting zone. Overall, impacts under alternative B would be long term, minor to moderate, and adverse as well as long term and beneficial for ORV users at the national recreation area. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative B, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would create more visitor amenities that would enhance visitor use and experience at the national recreation area. Additionally, a greater presence of law enforcement, as well as the rangers' ability to revoke ORV permits, may cause visitor violations and illegal activity to decrease. As a result, impacts under alternative C would be long term, minor, and adverse, because users would need to adjust to a user fee, as well as long term and beneficial from enhanced safety and additional amenities, ORV rules, and education. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative C, would result in long-term minor adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.	The proposed permit fee, while being an additional cost to visitors, would fund more visitor amenities that would enhance visit use and experience at the national recreation area. Additionally, a greater presence of law enforcement and the rangers' ability to revoke ORV permits may cause visitor violations and illegal activity to decrease, which would have beneficial effects on visitor health and safety. Additionally, the establishment of zones and implementation of a permit system would have beneficial impacts for the majority of visitors by separating uses, implementing rules (speed limits, headlights, and orange flags for ATVs), education, improving safety, and enhancing resource conditions at the national recreation area. Overall, impacts under alternative D would be long term, minor to moderate, and adverse, because users would need to adjust to a user fee and a zoning system, and long term and beneficial due to improvements to visitor use and experience / health and safety. Past, present, and reasonably foreseeable future actions both inside and outside the national recreation area, when combined with the impacts of alternative D, would result in long-term minor to moderate adverse and long-term beneficial cumulative impacts on visitor use and experience / health and safety.
Lake Meredith National Recreation Area Management and Operations	Staffing and funding levels would continue at the same levels as currently managed. The total approximate cost of implementing alternative A would be \$315,000. Actions under alternative A would result in long-term negligible adverse impacts because there would be no noticeable change in national recreation area management and operations. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative A, would result in parkwide long-term negligible to minor adverse impacts on national recreation area management and operations.	The implementation of alternative B would require additional efforts from park staff. Law enforcement staff levels would be increased to ensure compliance with the additional regulations under alternative B. Additionally, there would be an increase in responsibilities for the interpretation and resource management staff. The total approximate cost of implementing alternative B would be \$1,775,000. The implementation of alternative B would result in long-term minor to moderate adverse impacts on national recreation area management and operations, with impacts more moderate than minor because a fee permit system would not be in place to help offset additional expenses. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative B, would result in long-term minor to moderate adverse impacts.	The implementation of alternative C would require additional efforts from national recreation area staff in the areas of law enforcement, resource management, interpretation, and facilities management, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative C would be \$442,500 and would be offset, in part, by money collected in the proposed fee system. The implementation of alternative C would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative C, would result in long-term minor to moderate adverse cumulative impacts.	The implementation of alternative D would require additional efforts from park staff in the area of law enforcement, which would in part be offset by fees from the ORV permit. The total approximate cost of implementing alternative D would be \$1,775,000. The implementation of alternative D would result in long-term minor to moderate adverse impacts, which would be more minor than moderate due to the funding from the permit system. Past, present, and reasonably foreseeable future actions, when combined with the impacts of implementing alternative D, would result in long-term minor to moderate adverse cumulative impacts.

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Acronyms

ASMIS	Archeological Sites Management Information System
ASU	Arizona State University
ATV	all-terrain vehicle
BOR	Bureau of Reclamation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRMWA	Canadian River Municipal Water Authority
dBA	A-weighted decibel
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FM	farm to market
GIS	Geographical Information System
GMP	general management plan
mph	miles per hour
MTBE	methyl tertiary butyl ether
NEPA	National Environmental Policy Act
NPOMA	National Parks Omnibus Management Act
NPS	National Park Service
OHV	off-highway vehicle
ORV	off-road vehicle
PEPC	Planning, Environment and Public Comment
plan/EIS	ORV Management Plan / Environmental Impact Statement
ROI	region of influence
TCEQ	Texas Department of Environmental Quality
TMDL	total maximum daily load
TPWD	Texas Parks and Wildlife Department
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
UTV	utility terrain vehicle