LIST OF APPENDICES

Appendix A:	Stipulations and Environmental Best Practices Applicable to Oil and Gas Leasing and Other Surface-disturbing Activities
Appendix B:	U.S. Fish and Wildlife Service Biological Opinion Memorandum
Appendix C:	State Historic Preservation Office Letter of Concurrence
Appendix D:	Utah Standards for Rangeland Health and Guidelines for Grazing Management
Appendix E:	Moab RMP Monitoring Plan
Appendix F:	Tentative Implementation Schedule
Appendix G:	Land Tenure Adjustments and Withdrawal Criteria
Appendix H:	Film Permits: Minimum Impact Criteria
Appendix I:	Lands Identified for Disposal in the Moab RMP
Appendix J:	Letter from the State of Utah Regarding Air Quality Mitigation Strategies
Appendix K:	Identification of Wilderness Characteristics on Non-WSA Lands Managed by the Moab BLM
Appendix L:	Moab Field Office Recreation Rules
Appendix M:	Special Recreation Management Areas: Goals, Settings, Outcomes, and Management Prescriptions
Appendix N:	Travel Plan Development
Appendix O:	Hydraulic Considerations for Pipelines Crossing Stream Channels
Appendix P:	Wild and Scenic Rivers Study Process
Appendix Q:	Conservation Measures for Threatened and Endangered Species of Utah from the Use Plan Programmatic BAs and Section 7 Consultation
Appendix R:	Best Management Practices for Raptors and their Associated Habitats in Utah
Appendix S:	Desired Future Conditions for Vegetation
Appendix T:	Drought Classification System
Appendix U:	Additional Wildlife Information

APPENDIX A.
STIPULATIONS AND ENVIRONMENTAL BEST PRACTICES APPLICABLE TO OIL AND GAS LEASING AND OTHER SURFACE-DISTURBING ACTIVITIES

A.1
STIPULATIONS APPLICABLE TO OIL AND GAS LEASING AND OTHER SURFACE-DISTURBING ACTIVITIES

This appendix lists the stipulations for oil and gas leasing referred to throughout this Record of Decision and Approved RMP. These stipulations will also apply, where appropriate and practical, to other surface-disturbing activities (and occupancy) associated with land-use authorizations, permits, and leases issued on BLM lands. The stipulations would not apply to activities and uses where they are contrary to laws, regulations, or specific program guidance. The intent is to maintain consistency, to the extent possible, in applying stipulations to all surface-disturbing activities.

Surface-disturbing activities are those that normally result in more than negligible disturbance to public lands and accelerate the natural erosive process. Surface disturbance may, but does not always, require reclamation. These activities normally involve use and/or occupancy of the surface, cause disturbance to soils and vegetation, and are usually caused by motorized or mechanical actions. They include, but are not limited to: the use of mechanized earth-moving equipment; truck-mounted drilling and geophysical exploration equipment; off-road vehicle travel in areas designated as limited or closed to off-road vehicle use; vegetation treatments; construction of facilities such as power lines, pipelines, oil and gas wells; recreation sites, improvements for range and wildlife; new road construction; and use of pyrotechnics and explosives. Surface disturbance is not normally caused by casual-use activities. Activities that are not considered surface-disturbing include, but are not limited to: livestock grazing, cross-country hiking, minimum impact filming, and vehicular travel on designated routes.

A.1.1
DESCRIPTION OF STIPULATIONS

The following tables show resources of concern and stipulations including exceptions, modifications, and waivers by alternative. Three types of stipulations could be applied to land-use authorizations: 1) no surface occupancy (NSO), 2) timing limitations (TL), and 3) controlled surface use (CSU). Although not a stipulation, areas that are closed to oil and gas leasing and other surface-disturbing activities are also identified in the tables. All other areas are open to oil and gas leasing subject to standard terms and conditions.

Areas identified as NSO are open to oil and gas leasing but surface-disturbing activities can not be conducted on the surface of the land. Access to oil and gas deposits would require horizontal drilling from outside the boundaries of the NSO areas. NSO areas are avoidance areas for rights-

of-way; no rights-of-ways would be granted in NSO areas unless there are no feasible alternatives. Where necessary in the future, NSO areas could be recommended for withdrawal from operations conducted under the mining laws (locatable minerals) if unacceptable resource impacts are occurring or could occur. A NSO stipulation cannot be applied to operations conducted under the mining laws without a withdrawal. A withdrawal is not a land-use planning decision because it must be approved by the Secretary of Interior. Therefore, unless withdrawn, areas identified as NSO are open to operations conducted under the mining laws subject only to TL and CSU stipulations, which are consistent with the rights granted under the mining laws.

Areas identified as TL are open to oil and gas leasing but would be closed to surface-disturbing activities during identified time frames. This stipulation would not apply to operation and maintenance activities, including associated vehicle travel, unless otherwise specified.

Areas identified as CSU are open to oil and gas leasing but would require proposals for surface-disturbing activities to be authorized only according to the controls or constraints specified.

Areas identified as closed are not open to oil and gas leasing. Exceptions, modifications, and waivers do not apply to closed areas. Closed areas are exclusion areas for rights-of-way. WSAs and wilderness areas are closed to oil and gas leasing by the regulations found at 43 CFR 3100.0-3(a)(2)viii and xi. Also, areas identified with wilderness characteristics are closed in Alternative B. Other areas are partially closed to oil and gas leasing where it is not reasonable to apply a NSO stipulation across the entire area. This includes areas where the oil and gas resources are physically inaccessible by current directional drilling technology (1 mile) from outside the NSO area. These lands closed to oil and gas leasing are retained with a NSO stipulation for all other surface-disturbing activities and exceptions, modifications, and waivers apply to these activities. Closed areas identified with wilderness characteristics in Alternative B could be recommended for withdrawal of operations conducted under the mining laws. WSAs and wilderness areas are already protected from these activities by withdrawal or existing laws, regulations, and policies.

A.1.2
EXCEPTIONS, MODIFICATIONS, AND WAIVERS

Stipulations could be excepted, modified, or waived by the authorized officer. An exception exempts the holder of the land-use authorization document from the stipulation on a one-time basis. A modification changes the language or provisions of a surface stipulation, either temporarily or permanently. A waiver permanently exempts the surface stipulation. The environmental analysis document prepared for site specific proposals such as oil and gas development (i.e., APDs, sundry notices) also would need to address proposals to exempt, modify, or waive a surface stipulation.

A.1.3
STANDARD TERMS AND CONDITIONS

All surface-disturbing activities are subject to standard terms and conditions. These include the restrictions that are required for proposed actions in order to protect special status species and to comply with the Endangered Species Act. The requirements for individual species are found at the end of Table C.1. Standard terms and conditions for oil and gas leasing provide for relocation of proposed operations up to 200 meters, and provide for prohibiting surface-disturbing operations for a period not exceeding 60 days. The stipulations addressed in the table that are within the parameters of 200 meters and 60 days are considered open to oil and gas leasing subject to standard terms and conditions.

The placement of production facilities on hilltops and ridgelines will be prohibited where they are highly visible.

A.1.4
ENVIRONMENTAL BEST MANAGEMENT PRACTICES (BMP) FOR OIL AND GAS OPERATIONS

Best Management Practices (BMP) are state-of-the-art mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse environmental or social impacts. BMPs are applied to management actions to aid in achieving desired outcomes for safe, environmentally sound, resource development by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. For each proposed action, a number of BMPs may be applied as necessary to mitigate expected impacts. The following typical environmental BMPs will be applied on individual Applications for Permit to Drill and associated rights-of-way in the Moab Field Office. These procedures are consistent with current national guidance and the Surface Operating Standards and Guidelines for Oil and Gas Development (Gold Book), 2007. This list is not comprehensive and may be modified over time as conditions change and new practices are identified.

- Interim reclamation of the well and access road will begin as soon as practicable after a well is placed in production. Facilities will be grouped on the pads to allow for maximum interim reclamation. Interim reclamation will include road cuts and fills and will extend to within close proximity of the wellhead and production facilities.
- All aboveground facilities including power boxes, building doors, roofs, and any visible equipment will be painted a color selected from the latest national color charts that best allows the facility to blend into the background.
- All new roads will be designed and constructed to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use. Roads will follow the contour of the land where practical. Existing oil and gas roads that are in eroded condition or contribute to other resource concerns will be brought to BLM standards within a reasonable period of time.

- Final reclamation of all oil and gas disturbance will involve re-contouring of all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography and revegetating all disturbed areas.
- Raptor perch avoidance devices will be installed on all new power lines and existing lines that present a potential hazard to raptors.
- All power lines to individual well locations (excluding major power source lines to the operating oil or gas field) and all flow lines will be buried in or immediately adjacent to the access roads.
- In developing oil and gas fields, all production facilities will be centralized to avoid tanks and associated facilities on each well pad.
- The use of submersible pumps will be strongly encouraged, especially in VRM Class I, II or III areas or any area visible by the visiting public.
- The use of partial or completely below-grade wellheads will be strongly encouraged in high visibility areas as well as VRM Class I, II or III areas.
- Multiple wells will be drilled from a single well pad wherever feasible.
- Noise reduction techniques and designs will be used to reduce noise from compressors or other motorized equipment.
- Seasonal restrictions on public vehicular access will be evaluated where there are wildlife conflict or road damage/maintenance issues.
- The placement of production facilities on hilltops and ridgelines will be prohibited where they are highly visible.
- Monitoring of wildlife will occur to evaluate the effects of oil and gas development.
- The placement of production facilities on hilltops and ridgelines will be avoided.
- Facilities will be screened from view.
- Oil field wastes and spills will be bio-remediated.
- Common utility or right-of-way corridors containing roads, power lines, and pipelines will be used.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Floodplains, Riparian Areas, Springs, and Public Water Reserves	Planning Area	CSU Open with standard terms for oil and gas leasing. The 200 meter rule would apply.	Allow no surface-disturbing activities within 100 year floodplains or within 100 meters of riparian areas. Also, no surface-disturbing activities within public water reserves or within 100 meters of springs. **Purpose:** To protect floodplains, riparian areas, springs, and public water reserves. **Exception:** An exception could be authorized if: (a) there are no practical alternatives, (b) impacts could be fully mitigated, or (c) the action is designed to benefit and enhance the resource values. **Modification:** None **Waiver:** None
River Corridors , including suitable Wild and Scenic River Segments	Green, Colorado, and Dolores, Rivers (65,037 acres including 151.5 miles of suitable Wild and Scenic river segments along the Colorado, Green, and Dolores Rivers)	NSO	There will be no surface-disturbing activities within the area of the Three Rivers and Westwater mineral withdrawals which includes suitable Wild and Scenic River segments. Where the NSO area is physically inaccessible to oil and gas drilling by current directional drilling technology (1 mile from outside the NSO area), it will be closed to oil and gas leasing. However, these lands remain NSO for all other surface-disturbing activities. **Purpose:** To protect riparian, wildlife, scenic, and recreational values along the major river corridors. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of the applicable resources. No exception for oil and gas leasing. Exceptions could be made on the Colorado River along Highways 128 and 279, along Kane Creek Road, along the Green River from Swasey's Rapid to Ruby Ranch, and along the Dolores River from Entrada Ranch to the Colorado River confluence to maintain or improve infrastructure. These exceptions (subject to appropriate mitigation to minimize impacts to the applicable resources) could include minor rights-of-way to service private land and temporary use authorizations. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Sensitive Soils/Slopes	Bookcliffs	TL	Where slopes are greater than 30% in the Bookcliffs, BLM approved surface-disturbing activities are not allowed from November 1 to April 30. This restriction includes heavy equipment traffic on existing roads associated with drilling operations. **Purpose:** To minimize watershed damage in fragile soils on steep slopes. **Exception:** An exception could be granted if the operator can provide a plan of development demonstrating that the proposed action would be properly designed and constructed to support the anticipated types and levels of use. Roads must be designed to meet BLM road standards for drainage control and surfaced to support heavy equipment and tractor trailers. Adjustments to the timing restriction could be considered by the Field Manager on a case-by-case basis, depending on current soil and weather conditions. **Modification:** None **Waiver:** None
Fragile Soils/Slopes	Saline Soils in the Mancos Shale 330,142 acres	TL	No surface-disturbing activities are allowed during the period from December 1 to May 31. This restriction includes heavy equipment traffic on existing roads associated with drilling operations. **Purpose:** To minimize watershed damage including compaction, rutting, and topsoil loss on saline soils derived from the Mancos Shale. **Exception:** An exception could be granted if the operator can provide a plan of development demonstrating that the proposed action would be properly designed and constructed to support the anticipated types and levels of use. Roads must be designed to meet BLM road standards for drainage control and surfaced to support heavy equipment and tractor trailers. Adjustments to the timing restriction could be considered by the Field Manager on a case-by-case basis, depending on current soil and weather conditions. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Visual Resources	VRM II Areas 349,683 acres	CSU	Surface-disturbing activities must meet the objectives of VRM II class objectives. **Purpose:** To protect high quality visual resources. **Exception:** The level of change to the landscape should be low; management activities may be seen, but should not attract attention of the casual observer. Any change to the landscape must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Surface-disturbing activities that are determined to be compatible and consistent with the protection or enhancement of the resource values are exempted. Also, recognized utility corridors are exempted only for utility projects which would be managed according to VRM III objectives. **Modification:** None **Waiver:** None
Visual Resources	Scenic Driving Corridors Highways 128, 279, 313, north U.S. 191; Needles, Anticline and Kane Creek Roads	CSU	Surface-disturbing activities within the corridor (0.5 miles from center line) must meet VRM II class objectives. **Purpose:** To protect the visual resources along scenic corridors. **Exception:** An exception could be granted if: (a) a view shed analysis indicates no impairment of the visual resources from the driving corridor or (b) the action is determined to be consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of these resources. **Modification:** None **Waiver:** None
Visual Resources and Recreation	Sand Flats SRMA 6,246 acres	NSO	No surface-disturbing activities are allowed within the Sand Flats SRMA. **Purpose:** To protect recreation and scenic values. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of the applicable resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Visual Resources and Recreation	Goldbar/Corona Arch Focus Area 4,191 acres	NSO	No surface-disturbing activities are allowed in the Goldbar/Corona Arch area. The acreage changes by alternative. **Purpose:** To protect primitive hiking opportunities and scenic values. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of the applicable resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None
Developed Recreation Sites	Planning Area	NSO	No surface-disturbing activities are allowed within 0.5 miles of developed recreation sites (current and planned). **Purpose:** To protect federal investment in facilities, to provide for recreational use, and to protect the view shed from the facility. **Exception:** An exception could be granted if a viewshed analysis indicates no impairment of the visual resources from the recreation site. Also, an exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of the applicable resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None
Private Property with Federal Minerals	Areas within Spanish Valley	NSO	No surface-disturbing activities are allowed on private surface/Federal minerals within unincorporated areas of Spanish Valley. **Purpose:** To reduce potential surface use conflicts with homes and viewsheds. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Private Property with Federal Minerals	City of Moab and Town of Castle Valley (Incorporated areas totaling 2,540 acres)	Closed	The incorporated areas of the City of Moab and the Town of Castle Valley are closed to mineral leasing (oil and gas, potash). **Purpose:** Incorporated cities and towns are closed to oil and gas leasing by Federal regulation at 43 CFR 3100.0-3(a)(2)(iii). **Exception:** None. **Modification:** None **Waiver:** None
Moab Airport	Moab Airport	NSO	No surface-disturbing activities are allowed within the Moab Airport area. **Purpose:** To eliminate potential safety issues and surface use conflicts. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts. **Modification:** None **Waiver:** None
Moab Landfills (Klondike and Sand Flats)	Moab Landfills	NSO	No surface-disturbing activities are allowed within the Moab landfill area. **Purpose:** To eliminate potential safety issues and surface use conflicts. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts. **Modification:** None **Waiver:** None
Dead Horse Point State Park	Dead Horse Point State Park (Split estate with Federal minerals)	NSO	No surface-disturbing activities are allowed within Dead Horse Point State Park. **Purpose:** To protect visual resources and to facilitate management of the State Park. **Exception:** None. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Mayberry Orchard	Split estate with Federal minerals along the Colorado River,	NSO	No surface-disturbing activities are allowed on private surface/Federal minerals within Mayberry Orchard. **Purpose:** To reduce potential surface use conflicts with homes and view sheds. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts. **Modification:** None **Waiver:** None
Thompson Springs	Thompson Springs (Split estate with Federal minerals)	NSO	No surface-disturbing activities are allowed on private surface/Federal minerals within Thompson Springs. **Purpose:** To reduce potential surface use conflicts with homes. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts. **Modification:** None **Waiver:** None
Castle Valley Municipal Watershed	BLM lands within the watershed. Includes split estate lands (private surface/Federal minerals) within Castle Valley 10,321 acres	NSO	No surface-disturbing activities are allowed within the Castle Valley watershed. **Purpose:** To protect the sole source, unconfined, surficial aquifer of Castle Valley. **Exception**: An exception could be granted for activities where it can be demonstrated that the proposed action would not result in a negative impact to the aquifer. No exception for oil and gas leasing. **Modification**: None **Waiver**: None
Mill Creek-Spanish Valley Watershed (Moab area aquifer excluding the watershed within the WSA)	BLM lands within the watershed. Includes split estate lands (private surface/Federal minerals). 9,667 acres	NSO	No surface-disturbing activities are allowed within the Mill Creek-Spanish Valley watershed. **Purpose:** To protect the Moab area aquifer. **Exception**: An exception could be granted for activities where it can be demonstrated that the proposed action would not result in a negative impact to the aquifer. No exception for oil and gas leasing. **Modification**: None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Moab Canyon Utility Corridor	Highway 191 Utility Corridor within Moab Canyon	NSO	No surface-disturbing activities are allowed within the utility corridor other than those associated with utilities. **Purpose:** To prevent future surface use conflicts along Highway 191 and within the utility corridor. **Exception:** An exception could be granted if it can be demonstrated that the action would not result in any surface use conflicts with utilities. **Modification:** None **Waiver:** None
Areas with Wilderness Characteristics (non-WSA lands).	Beaver Creek, Fisher Towers, and Mary Jane Canyon	NSO	No surface-disturbing activities are allowed. Certain lands within the Fisher Towers, Mary Jane, and Beaver Creek areas would be physically inaccessible to oil and gas drilling operations under a NSO stipulation and therefore are closed to oil and gas leasing. These lands remain NSO for all other surface-disturbing activities. **Purpose:** To protect areas with wilderness characteristics. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of the applicable resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None
ACEC	Behind the Rocks 5,201 acres	NSO	No surface-disturbing activities are allowed in the Behind the Rocks ACEC (outside of the WSA). **Purpose:** To protect scenic values, cultural resources, and sensitive plants. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or if the use would provide a public benefit or the use would provide suitable opportunities for public enjoyment of the resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
ACEC	Cottonwood-Diamond Watershed 35,830 acres (34,005 acres are within a WSA and are closed to leasing)	NSO	No surface-disturbing activities are allowed within the Cottonwood-Diamond ACEC. **Purpose:** To provide for public safety and watershed stabilization. **Exception:** When the hazard is no longer present, manage according to the other management provisions for the area. **Modification:** None **Wavier:** None
ACEC	Highway 279/Shafer Basin/Long Canyon 13,500 acres	NSO	No surface-disturbing activities are allowed in the Highway 279/Shafer Basin/Long Canyon ACEC, **Purpose:** To protect rare plants, scenic, wildlife, and cultural resources. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of these resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None
ACEC	Mill Creek Canyon 3,721 acres	NSO	No surface-disturbing activities are allowed in the Mill Creek Canyon ACEC. **Purpose:** To protect scenic, cultural, wildlife, and riparian values. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of these resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
ACEC	Ten Mile Wash 4,980 acres	NSO	No surface-disturbing activities are allowed within the Ten Mile ACEC. **Purpose:** To protect cultural and riparian values. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of these resources. No exception for oil and gas leasing. **Modification:** None **Wavier:** None
Mesa-top Relict Vegetation	Upper Courthouse Wash Area 3,162 acres	NSO	No surface-disturbing activities are allowed on the mesa-tops in the upper Courthouse Wash area. **Purpose:** To protect relict vegetation. **Exception:** An exception could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or the use would provide suitable opportunities for public enjoyment of these resources. No exception for oil and gas leasing. **Modification:** None **Waiver:** None
Special Status Species: Greater Sage-grouse	Lek Sites within Sage-grouse habitat 3,068 acres	CSU	If Greater Sage-grouse leks are discovered within sage grouse habitat, no surface-disturbing activities will be allowed within 0.5 miles of a lek. **Purpose:** To protect occupied lek sites within Greater sage-grouse habitat. **Exception:** An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, or (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined area; as determined by the BLM. **Waiver:** A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or destroyed or occur outside current defined area, as determined by the BLM.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Special Status Species: Greater Sage-grouse	Nesting and Brood Rearing Habitat 3,068 acres	TL	Allow no surface-disturbing activities in occupied nesting and brood rearing habitat within 2.0 miles of a lek from March 15th to July 15th. **Purpose:** To protect occupied nesting and brood rearing habitat for the Greater sage-grouse. **Exception:** An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the brooding/nesting habitat is not active. **Modification:** The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include brooding/nesting habitat, or (2) the brooding/nesting habitat has been completely abandoned or destroyed, or (3) occupied brooding/nesting habitat occurs outside the current defined area; as determined by the BLM. **Waiver**: A waiver may be granted if there is no active brooding/nesting habitat in the leasehold and it is determined the habitat has been completely abandoned or destroyed or occurs outside the current defined area, as determined by the BLM.
Special Status Species: Greater Sage-grouse	Winter Habitat 3,068 acres	TL	Allow no surface-disturbing activities in occupied winter habitat from November 15th to March 14th. **Purpose:** To protect occupied winter habitat for the Greater sage-grouse. **Exception:** An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not occupied during the winter season. **Modification:** The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include winter habitat, or (2) the brooding/nesting habitat has been completely abandoned or destroyed, or (3) occupied winter activity occurs outside the current defined area; as determined by the BLM. **Waiver**: A waiver may be granted if the winter habitat in the leasehold has been completely abandoned or destroyed or occurs outside the current defined area, as determined by the BLM.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Special Status Species: Gunnison Sage-grouse	Lek Sites within Sage-grouse habitat 175,727 acres	CSU	If Gunnison sage-grouse leks are discovered within sage-grouse habitat, no surface-disturbing activities will be allowed within 0.6 miles of a lek . **Purpose:** To protect occupied lek sites within Gunnison sage-grouse habitat. **Exception:** An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the boundaries of the stipulation area if (1) portions of the area do not include lek sites, or (2) the lek site(s) have been completely abandoned or destroyed, or (3) occupied lek site(s) occur outside the current defined area, as determined by the BLM. **Waiver**: A waiver may be granted if there are no active lek site(s) in the leasehold and it is determined the site(s) have been completely abandoned or destroyed or occur outside current defined area, as determined by the BLM.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Special Status Species: White-tailed Prairie Dog	White-tailed prairie dog habitat 117,481 acres	CSU Open with standard terms for oil and gas leasing. The 200 meter rule can be applied.	Do not allow surface-disturbing activities within 660 feet of prairie dog colonies identified within prairie dog habitat (the size of the habitat varies by alternative). No permanent aboveground facilities are allowed within the 660 feet buffer. **Purpose:** To protect white-tailed prairie dog habitat. **Exception:** An exception may be granted if the applicant submits a plan that indicates that impacts of the proposed action can be adequately mitigated or, if due to the size of the town, there is no reasonable location to develop a lease and avoid colonies the Field Manager will allow for loss of prairie dog colonies and/or habitat to satisfy terms and conditions of the lease. **Modification:** The Field Manager may modify the boundaries of the stipulation area if portions of the area does not include prairie dog habitat or ***active*** colonies are found outside current defined area, as determined by BLM. **Waiver:** May be granted if in the leasehold if is determined that habitat no longer exists or has been destroyed.
Special Status Species: Gunnison Prairie Dog	Gunnison prairie dog habitat 10,740 acres	CSU Open with standard terms for oil and gas leasing. The 200 meter rule can be applied.	Do not allow surface-disturbing activities within 660 feet of active prairie dog colonies identified within prairie dog habitat. No permanent aboveground facilities are allowed within the 660 feet buffer. **Purpose:** To protect Gunnison prairie dog habitat. **Exception:** An exception may be granted if the applicant submits a plan that indicates that impacts of the proposed action can be adequately mitigated or, if due to the size of the town, there is no reasonable location to develop a lease and avoid colonies the Field Manager will allow for loss of prairie dog colonies and/or habitat to satisfy terms and conditions of the lease. **Modification:** The Field Manager may modify the boundaries of the stipulation area if portions of the area does not include prairie dog habitat or ***active*** colonies are found outside current defined area, as determined by BLM. **Waiver:** May be granted if it is determined that the habitat no longer exists or has been destroyed within the leasehold.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Wildlife : Desert Bighorn Sheep	Desert Bighorn Lambing Grounds and Migration Corridors 101,897 acres	NSO	No surface-disturbing activities are allowed within desert bighorn lambing grounds and migration corridors. **Purpose:** To minimize disturbance within desert bighorn lambing grounds and migration corridors. **Exception:** Within migration corridors, pipeline and road construction and geophysical exploration for oil and gas development would be allowed from June 16th through October 14th and from December 16th through March 31st. The Field Manager may also grant an exception if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated. **Modification:** The Field Manager may modify the boundaries of the stipulation area if a portion of the area is (1) not being used as desert bighorn lambing grounds or migration corridors (2) if habitat is being utilized outside of stipulation boundaries for and needs to be protected. **Waiver:** A waiver may be granted if the habitat is determined as unsuitable for lambing or migration and there is no reasonable likelihood of future use as desert bighorn lambing and/or rutting grounds and migration corridors.
Wildlife: Pronghorn	Pronghorn Fawning Grounds within Cisco Desert & Hatch Point (LaSal Wildlife Management Units) 293,741 acres	TL Open with standard terms for oil and gas leasing. The 60 day rule can be applied	Allow no surface-disturbing activities from May 1 to June 15 within fawning grounds. The acreage of habitat varies by alternative. **Purpose:** To minimize stress and disturbance during critical antelope birthing time. **Exception:** May be granted to these dates by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or if it is determined the habitat is not being utilized for fawning in any given year. **Modification:** The Field Manager may modify the boundaries of the stipulation area if a portion of the area is not being used as fawning grounds or if habitat is being utilized outside of stipulation boundaries as crucial fawning grounds and needs to be protected. **Waiver:** May be granted if the fawning grounds are determined to be unsuitable or unoccupied and there is no reasonable likelihood of future use of the fawning grounds.

Table A1 Resources of Concern and Stipulations Including Exceptions, Modifications, and Waivers

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Wildlife : Deer & Elk	Deer and Elk Winter Range 349,955 acres	TL	Do not allow surface-disturbing activities from November 15 to April 15. **Purpose:** To minimize stress and disturbance to deer and elk during critical winter months. **Exception:** This stipulation does not apply to the maintenance and operation of existing and ongoing facilities. An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not being utilized during the winter period for any given year. **Modification:** The Field Manager may modify the boundaries of the stipulation area (1) if a portion of the area is not being used as winter range by deer/elk or (2) if habitat is being utilized outside of stipulation boundaries as winter range and needs to be protected or (3) if the migration patterns have changed causing a difference in the season of use. **Waiver:** May be granted if the winter range habitat is unsuitable or unoccupied during winter months by deer/elk and there is no reasonable likelihood of future winter range use.
Wildlife – Deer & Elk	Deer and Elk Fawning and Calving Habitat (Bookcliffs and La Sal Wildlife Management Units) 105,636 acres	TL Open with standard terms for oil and gas leasing. The 60 day rule can be applied	Allow no surface-disturbing activities in deer and elk fawning and calving habitat from May 15 to June 30. **Purpose:** To minimize stress and disturbance during this critical period. **Exception:** This stipulation does not apply to the maintenance and operation of existing and ongoing facilities. An exception may be granted by the Field Manager if the operator submits a plan which demonstrates that impacts from the proposed action can be adequately mitigated or it is determined the habitat is not being utilized during the critical period for any given year. **Modification:** The Field Manager may modify the boundaries of the stipulation area (1) if a portion of the area is not being used as fawning and calving habitat or (2) if the habitat is being utilized outside of stipulation boundaries and needs to be protected or (3) if the migration patterns have changed causing a difference in the season of use. **Waiver:** May be granted if the fawning and calving habitat is unsuitable or unoccupied during winter months by deer/elk and there is no reasonable likelihood of future winter range use.

Table A2 Closed Areas (Nondiscretionary)

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Wilderness Study Areas	Behind The Rocks (12,635 acres), Black Ridge (52 acres), Coal Canyon (64,546 acres), Desolation Canyon (81,603 acres), Floy Canyon (72,605 acres, Flume Canyon (50,800 acres), Lost Spring Canyon (1,624 acres), Mill Creek Canyon (9,780 acres), Negro Bill Canyon (7,820 acres), Spruce Canyon (20,990 acres), West Water Canyon (31,160 acres). Total = 353,606 acres	Closed	Areas within Wilderness Study Areas are closed to oil and gas leasing and other surface-disturbing activities. **Purpose:** To protect wilderness values. **Exception:** None **Modification:** None **Waiver:** None
Designated wilderness	Black Ridge (5,200 acres)	Closed	The designated Black Ridge Wilderness is closed to oil and gas leasing and other surface-disturbing activities. **Purpose:** To protect wilderness values. **Exception:** None **Modification:** None **Waiver:** None

Table A3 Closed Areas (Discretionary)

Lands where a NSO stipulation is not reasonable because they would be physically inaccessible to oil and gas directional drilling operations.	Within areas of the Three Rivers Withdrawal, and within the Beaver Creek, Fisher Towers and Mary Jane areas with wilderness characteristics (25,306 acres).	Closed	The lands identified are closed to oil and gas leasing because they would be physically inaccessible by directional drilling operations using current technology if a NSO stipulation were to be applied. These areas remain NSO for all other surface-disturbing activities. **Purpose:** To protect the resource values within the areas identified. **Exception:** None **Modification:** None **Waiver:** None

Table A4 Standard Terms and Conditions (Oil and Gas Lease Notices) Applicable to all Surface-disturbing Activities which are Required to Protect Special Status and Federally Protected Species and to Comply with Endangered Species Act

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Special Status Species: Mexican Spotted Owl (MSO)	MSO Habitat and Nest Sites 121,686 acres	CSU/TL	In areas that contain suitable habitat for MSO or designated Critical Habitat, actions will be avoided or restricted that may cause stress and disturbance during nesting and rearing of their young. Appropriate measures will depend on whether the action is temporary or permanent and whether it occurs within or outside the owl nesting season. A temporary action is completed prior to the following breeding season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding season and/or causes a loss of owl habitat or displaces owls through disturbances, i.e., creation of a permanent structure. Current avoidance and minimization measures include the following: Surveys will be required prior to implementation of the proposed action. All surveys must be conducted by qualified individual(s) acceptable to the BLM. Assess habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the conservation measures below if project activities occur within 0.5 mile of suitable owl habitat. Determine potential effects of actions to owls and their habitat. Document type of activity, acreage and location of direct habitat impacts, type and extent of indirect impacts relative to location of suitable owl habitat. Document if action is temporary or permanent. Activities may require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated, and, if necessary, Section 7 consultation reinitiated. Any activity that includes water production should be managed to ensure maintenance of enhancement of riparian habitat. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in canyon habitat suitable for MSO nesting.

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			For all temporary actions that may impact owls or suitable habitat: a. If the action occurs entirely outside of the owl breeding season from **March 1 through August 31**, and leaves no permanent structure or permanent habitat disturbance, the action can proceed without an occupancy survey. b. If the action will occur during a breeding season, a survey for owls is required prior to commencing the activity. If owls are found, the activity should be delayed until outside of the breeding season. c. Rehabilitate access routes created by the project through such means as raking out scars, re-vegetation, gating access points, etc. For all permanent actions that may impact owls or suitable habitat: a. Survey two consecutive years for owls according to accepted protocol prior to commencing activities. b. If owls are found, no disturbing actions will occur within 0.5 mile of an identified site. If nest site is unknown, no activity will occur within the designated current and historic Protected Activity Center (PAC). c. Avoid permanent structures within 0.5 mile of suitable habitat unless surveyed and not occupied. d. Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 dBA at 0.5 mile from suitable habitat, including canyon rims. Placement of permanent noise-generating facilities should be contingent upon a noise analysis to ensure noise does not encroach upon a 0.5 mile buffer for suitable habitat, including canyon rims. e. Limit disturbances to and within suitable habitat by staying on designated and/or approved routes. f. Limit new access routes created by the project. Modifications to the Surface Use Plan of Operations may be required in order to protect the MSO and/or habitat in accordance with Section 6 of the lease terms, the Endangered Species Act, and the regulations at 43 CFR 3101.1-2. **Purpose:** To protect MSO habitat.

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			Exception: An exception may be granted by the Field Manager if authorization is obtained from USFWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature or the conduct of the actions would not impair the primary constituent element determined necessary for the survival and recovery of the MSO and USFWS concurs with this determination. **Modification:** The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates and USFWS (through applicable provisions of the ESA) determines a portion of the area is not being used as Critical Habitat. **Waiver:** A waiver may be granted if the MSO is de-listed and the Critical Habitat is determined by USFWS as not necessary for the survival and recovery of the MSO.
Federally Protected Species: Bald Eagles	Nest sites and winter roost areas within habitat for Bald Eagles 143,421 acres	CSU/TL	In areas that contain habitat for the bald eagle, actions will be avoided or restricted that may cause stress and disturbance during nesting and rearing of their young. Appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the bald eagle breeding or roosting season. A temporary action is completed prior to the following breeding or roosting season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding or roosting season and/or causes a loss of eagle habitat or displaces eagles through disturbances, i.e., creation of a permanent structure. Current avoidance and minimization measures include the following: 1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s), and be conducted according to protocol. 2. Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures would be evaluated. 3. Water production will be managed to ensure maintenance or enhancement of riparian habitat. 4. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season of **January 1 to August**

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			31, unless the area has been surveyed according to protocol and determined to be unoccupied. 5. Temporary activities within O.5 miles of winter roost areas, e.g., cottonwood galleries, will not occur during the winter roost season of **November 1 to March 31**, unless the area has been surveyed according to protocol and determined to be unoccupied. 6. No permanent infrastructure will be placed within 1.0 mile of nest sites. 7. No permanent infrastructure will be placed within 0.5 miles of winter roost areas. 8. Remove big game carrion to 100 feet from on lease roadways occurring within bald eagle foraging range. 9. Avoid loss or disturbance to large cottonwood gallery riparian habitats. 10. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable habitat. Utilize direction drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such direction drilling does not intercept or degrade alluvial aquifers. 11. All areas of surface disturbance within riparian areas and/or adjacent uplands should be re-vegetated with native species. Additional measures may also be employed to avoid or minimize effects to the species between the lease stage and lease development stage. **Purpose:** To protect bald eagle habitat. **Exception:** An exception may be granted by the Field Manager if authorization is obtained from USFWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the Bald Eagles and USFWS and UDWR concur with this determination.

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			Modification: The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and USFWS and UDWR (through applicable provisions of the ESA) determines that a portion of the area is not being used as Bald Eagle nesting territories. **Waiver:** May be granted if Bald Eagles are de-listed and if USFWS and UDWR determine it is not necessary to protect nesting territories according to the Endangered Species Act and The Bald Eagle Protection Act or if there is no reasonable likelihood of site occupancy over a minimum 10 year period.
Federally Protected Species: Golden Eagle	Golden Eagle nest sites and territories 12,902 acres	CSU/TL	No surface-disturbing activities will be allowed within a 0.5 miles radius of documented Golden Eagle nest sites within nesting territories from **February 1 to July 15th** or until fledgling and dispersal of young. Any access created by the action will be outside of nesting season and will be eliminated once action is complete. **Purpose:** To protect Golden Eagle nest sites and nesting territories. **Exception**: An exception may be granted by the Field Manager if authorization is obtained from USFWS and UDWR. The Field Manager may also grant an exception if an environmental analysis indicates that the nature or the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the Golden Eagle. **Modification:** The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates and USFWS and UDWR determine a portion of the area is not being used as Golden Eagle nesting territories. **Waiver:** A waiver may be granted if an individual Golden Eagle nest has been inactive (unoccupied) for at least a period of 3 years. Nest-monitoring data for a 3-year period will be required before the waiver could be granted.
Special Status Species: Southwestern Willow Flycatcher	Southwestern Willow Flycatcher Habitat (riparian areas)	CSU/TL	In areas that contain riparian habitat within the range for the Southwestern willow flycatcher, actions will be avoided or restricted that may cause stress and disturbance during nesting and rearing of their young. Appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside the nesting season. A temporary action

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			is completed prior to the following breeding season leaving no permanent structures and resulting in no permanent habitat loss. A permanent action continues for more than one breeding season and/or causes a loss of habitat or displaces flycatchers through disturbances, i.e., creation of a permanent structure. Current avoidance and minimization measures include the following: 1. Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s) and be conducted according to protocol. 2. Activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated. 3. Water production will be managed to ensure maintenance or enhancement of riparian habitat. 4. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat. Ensure that such directional drilling does not intercept or degrade alluvial aquifers. 5. Activities will maintain a 300 feet buffer from suitable riparian habitat year long. 6. Activities within 0.25 mile of occupied breeding habitat will not occur during the breeding season of **May 1 to August 15** 7. Ensure that water extraction or disposal practices do not result in change of hydrologic regime that will result in loss or degradation of riparian habitat. 8. Re-vegetate with native species all areas of surface disturbance within riparian areas and/or adjacent land. Additional measures to avoid or minimize effects to the species may be developed and implemented in consultation with the USFWS between the lease sale stage and lease development stage to ensure continued compliance with the ESA. **Purpose:** To protect southwestern willow flycatcher habitat.

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			Exception: An exception may be granted by the Field Manager if authorization is obtained from USFWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the southwestern willow flycatcher and USFWS concurs with this determination. **Modification:** The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and USFWS (through applicable provisions of the ESA) determines that a portion of the area is not being used as southwestern willow flycatcher habitat. **Waiver:** May be granted if the southwestern willow flycatcher is de-listed and if USFWS determines it is not necessary for the survival and recovery of the southwestern willow flycatcher.
Special Status Species: Yellow-billed Cuckoo	Yellow-billed Cuckoo Habitat	CSU/TL	No surface-disturbing activities will be conducted within 100 meters of Yellow-billed Cuckoo habitat (riparian areas) from May 15th through July 20th. **Purpose:** To manage Yellow-billed Cuckoo habitat. **Exception:** An exception may be granted by the Field Manager if authorization is obtained from USFWS (through applicable provisions of the ESA). The Field Manager may also grant an exception if an environmental analysis indicates that the nature of the conduct of the actions, as proposed or conditioned, will not impair the primary constituent element determined necessary for the survival and recovery of the Yellow-billed Cuckoo and USFWS concurs with this determination. **Modification:** The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and USFWS (through applicable provisions of the ESA) determines that a portion of the area is not being used as Yellow-billed Cuckoo habitat. **Waiver:** May be granted if the Yellow-billed Cuckoo is de-listed and if USFWS determines it is not necessary for the survival and recovery of the Yellow-billed Cuckoo.
Special Status Species–Sensitive Raptor Species:	Raptor Habitat Ferruginous Hawk	CSU/TL	In habitat for raptor species, no surface disturbances or occupancy will be conducted during the breeding and nesting

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
Ferruginous Hawk and Burrowing Owl	(158,928 acres) Burrowing Owl (1,652, 024 acres)		season (March 1 to August 31 for burrowing owl and March 1 – August 1 for ferruginous hawk) within spatial buffers (0.25 mile for burrowing owl and 0.5 mile for ferruginous hawk) of known nesting sites. **Purpose:** To protect raptor habitat. **Exception:** An exception would be granted if protocol surveys determine that nesting sites, breeding territories, and winter roosting areas are not occupied. **Modification:** The Field Manager may modify the boundaries of the stipulation area if portions of the area do not include habitat or are outside the current defined area, as determined by the BLM. **Waiver:** May be granted if it is determined the habitat no longer exists or has been destroyed.
Special Status Species: Critical Habitat of the Endangered Colorado River Fishes	Colorado River, Green River, Dolores River/Colorado River confluence, and all associated back waters 48,513 acres	NSO	Surface-disturbing activities within the 100 year floodplain of the Colorado River, Green River, and at the Dolores/Colorado River confluence will not be allowed. Other avoidance and minimization measures include: • Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individuals. • Lease activities will require monitoring throughout the duration of the project. To ensure desired results are being achieved, minimization measures will be evaluated and, if necessary, Section 7 consultation reinitiated. • Water production will be managed to ensure maintenance or enhancement of riparian habitat. • Avoid loss or disturbance of riparian habitats. • Conduct watershed analysis for leases in designated critical habitat and overlapping major tributaries in order to determine toxicity risk from permanent facilities • Implement the Utah Oil and Gas Pipeline Crossing Guidance. • In areas adjacent to 100 year floodplains, particularly in systems prone to flash floods, analyze the risk for flash

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			floods to impact facilities, and use closed loop drilling, and pipeline burial or suspension according to the Utah Oil and Gas Pipeline Crossing Guidance, to minimize the potential for equipment damage and resulting leaks or spills. **Purpose:** To protect critical habitat of the endangered Colorado River fishes. **Exception:** An exception may be granted by the Field Manager if: 1) There is no practical alternative, and 2) the development will enhance riparian/aquatic values. This exception will require consultation with the USFWS. The Field Manager may also grant an exception if an environmental analysis indicates that the nature or the conduct of the actions, as proposed or conditioned, would not impair the primary constituent element determined necessary for the survival and recovery of the Endangered Colorado River , fishes. **Modification:** The Field Manager may modify the boundaries of the stipulation area if an environmental analysis indicates, and USFWS (through applicable provisions of the ESA) determines a portion of the area is not being used as Critical Habitat. **Waiver:** A waiver may be granted if the Endangered Colorado River Fishes are de-listed and the Critical Habitat is determined by USFWS as not necessary for the survival and recovery of the Endangered Colorado River fishes.
Special Status Species: Kit Fox	Kit Fox Habitat Throughout planning area	CSU	In Kit Fox habitat, allow no surface disturbances within 200 meters of a kit fox den. **Purpose:** To protect Kit Fox habitat. **Exception:** An exception will be granted if protocol surveys determine that Kit Fox dens are not present. **Modification:** The Field Manager may modify the stipulation area if portions of the area do not contain habitat. **Waiver:** A waiver may be granted if it is determined that the habitat no longer exists.
Special Status Species: California Condor	California Condor Potential Habitat Throughout	CSU/TL	Avoidance or use restrictions may be placed on portions on areas known or suspected to be used by condors. Application of appropriate measures will depend on whether the action is temporary or permanent, and whether it occurs within or outside

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
	planning area		potential habitat. A temporary action is completed prior to the following important season of use, leaving for habitat functionality. A permanent action continues for more than one season of habitat use, and/or causes a loss of condor habitat function or displaces condors through continued disturbance (i.e. creation of a permanent structure requiring repetitious maintenance, or emits disruptive levels of noise). Current avoidance and minimization measures include the following: Surveys will be required prior to operations unless species occupancy and distribution information is complete and available. All surveys must be conducted by qualified individual(s) approved by the BLM, and must be conducted according to approved protocol. If surveys result in positive identification of condor use, all lease activities will require monitoring throughout the duration of the project to ensure desired results of applied mitigation and protection. Minimization measures will be evaluated during development and, if necessary, Section 7 consultation may be reinitiated. Temporary activities within 1.0 mile of nest sites will not occur during the breeding season. Temporary activities within 0.5 miles of established roosting sites or areas will not occur during the season of use, August 1 to November 31, unless the area has been surveyed according to protocol and determined to be unoccupied. No permanent infrastructure will be placed within 1.0 mile of nest sites. No permanent infrastructure will be placed within 0.5 miles of established roosting sites or areas. Remove big game carrion to 100 feet from on lease roadways occurring within foraging range. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in suitable habitat Utilize directional drilling to avoid direct impacts to large cottonwood gallery riparian habitats. Ensure that such directional drilling does not intercept or degrade alluvial aquifers. Reinitiation of section 7 consultation with the Service will be sought immediately if mortality or disturbance to California condors is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			minimize effects to the species. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA. Additional measures may also be employed to avoid or minimize effects to the species between the lease sale and lease development stages. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the Endangered Species Act.
Jones *cycladenia* (C. *humilis* var. *jonesii*)	Potential, suitable, and occupied habitat	TL/CSU	Potential, suitable, and occupied habitat are defined as follows: Potential habitat is defined as areas which satisfy the broad criteria of the species habitat description; usually determined by preliminary, in-house assessment. Suitable habitat is defined as areas which contain or exhibit the specific components or constituents necessary for plant persistence; determined by field inspection and/or surveys; may or may not contain clay reed-mustard; habitat descriptions can be found in Federal Register Notice and species recovery plan links at <http://www.fws.gov/endangered/wildlife.html>. Occupied habitat is defined as areas currently or historically known to support clay reed-mustard; synonymous with "known habitat." Current avoidance and minimization measures include the following: 1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat prior to any ground disturbing activities to determine if suitable Jones *cycladenia* habitat is present. 2. Site inventories will be conducted within suitable habitat to determine occupancy. Where standard surveys are technically infeasible and otherwise hazardous due to topography, slope, etc., suitable habitat will be assessed and mapped for avoidance (hereafter, "avoidance areas"); in such cases, in general, 300' buffers will be maintained between surface disturbance and avoidance areas. However, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat. Where conditions allow, inventories: a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols, b. Will be conducted in suitable and occupied habitat for all

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected (usually May 15st to June 30th, however, surveyors should verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower), c. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad, d. Will include, but not be limited to, plant species lists and habitat characteristics, and e. Will be valid until May 1st the following year. 3. Design project infrastructure to minimize impacts within suitable habitat: a. Where standard surveys are technically infeasible, infrastructure and activities will avoid all suitable habitat (avoidance areas) and incorporate 300' buffers, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat, b. Reduce well pad size to the minimum needed, without compromising safety, c. Where technically and economically feasible, use directional drilling or multiple wells from the same pad, d. Limit new access routes created by the project, e. Roads and utilities should share common right-of-ways where possible, f. Reduce the width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat, g. Place signing to limit off-road travel in sensitive areas, and h. Stay on designated routes and other cleared/approved areas. i. All disturbed areas will be revegetated with native species comprised of species indigenous to the area and non-native species that are not likely to invade other areas. 4. Within occupied habitat, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants: a. Follow the above recommendations (#3) for project design within suitable habitats, b. To avoid water flow and/or sedimentation into occupied habitat and avoidance areas, silt fences, hay bales, and similar

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			structures or practices will be incorporated into the project design; appropriate placement of fill is encouraged, d. Construction of roads will occur such that the edge of the right of way is at least 300' from any plant and 300' from avoidance areas, e. Roads will be graveled within occupied habitat; the operator is encouraged to apply water for dust abatement to such areas from May 15th to June 30th (flowering period); dust abatement applications will be comprised of water only, f. The edge of the well pad should be located at least 300' away from plants and avoidance areas, in general; however, site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat, g. Surface pipelines will be laid such that a 300' buffer exists between the edge of the right of way and plants and 300' between the edge of right of way and avoidance areas; use stabilizing and anchoring techniques when the pipeline crosses suitable habitat to ensure pipelines don't move towards the population; site specific distances will need to be approved by FWS and BLM when disturbance will occur upslope of habitat, h. Construction activities will not occur from May 15th through June 30th within occupied habitat, i. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc., j. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and k. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible. 5. Occupied Jones *cycladenia* habitats within 300' of the edge of the surface pipelines' right of ways, 300' of the edge of the roads' right of ways, and 300' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the Service. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.

Resource Of Concern	Applicable Area	Stipulation Code	Stipulation Description
			6. Reinitiation of section 7 consultation with the Service will be sought immediately if any loss of plants or occupied habitat for the Jones *cycladenia* is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA.

APPENDIX B.

U.S. FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION MEMORANDUM[1]

[1]The complete Biological Opinion is available as a separate CD.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
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WEST VALLEY CITY, UTAH 84119

OCT 29 2008

October 16, 2008

In Reply Refer To
FWS/R6
ES/UT
08-F-0058
6-UT-08-F-022

Memorandum

To: Field Office Manager, Bureau of Land Management, Moab Field Office, 82 East Dogwood, Moab, Utah 84532

From: for Utah Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services, West Valley City, Utah

Subject: Biological Opinion for BLM Resource Management Plan, Moab Field Office

This document transmits the Fish and Wildlife Service's (USFWS) Biological Opinion based on our review of potential activities described under the Resource Management Plans (RMP) of the Moab Field Office (MFO) Bureau of Land Management (BLM) and their potential effects on the federally threatened Mexican spotted owl (*Strix occidentalis lucida*), and Jones cycladenia (*Cycladenia humilis var. jonesii*), and federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). In addition, this document includes the Conference Opinion for the candidate species Yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and the experimental, non-essential population of the endangered California Condor (*Gymnogyps californianus*). Critical habitat was designated for the Mexican spotted owl on February 01, 2001, and was re-designated on August 31, 2004 (66 FR 8530, 69 FR 53181). Critical habitat was designated for the listed Colorado fish (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker) on March 21, 1994 (59 FR 13374). Critical habitat was designated for the southwestern willow flycatcher on October 12, 2004 (69 FR 60705); critical habitat for this species does not occur within the MFO planning area. Your July 18th, 2008 request for formal consultation for all aforementioned species was received on July 21st, 2008.

Utah BLM Resource Management Plan proposed activities are categorized into 18 programs, as follows:

Air Quality
Cultural Resources Management

Palentological Resources Management
Fire Management
Healthy and Safety Management
Lands and Realty Management
Livestock Grazing Management
Minerals Management
Recreation Management
Riparian Area Management
Soils and Watershed Management
Special Designations Management
Special Status Species Management
Travel Management
Vegetation Management
Visual Resource Management
Wildlife and Fisheries Management
Woodlands Resources Management

This Biological Opinion is based on information provided in the July 21st Biological Assessment, personal communications between the USFWS's biologists and the BLM's biologists, telephone conversations, email correspondence, conference calls, planning meetings, and other sources of information. A complete administrative record of this consultation is on file at this office.

Consultation History

This section summarizes significant steps in the consultation process. Additional correspondence, email transmissions, telephone conversation records, and conference calls that occurred between December 15, 2004, and April 20, 2007 are documented in the administrative record for this consultation.

- February 19th, 2008: The BLM electronically sent a draft Biological Assessment to determine impacts from the new Moab Resource Management Plan.

- April 7- July 14th 2008: The USFWS reviewed and provided comments on the draft Biological Assessment;

- July 21st, 2008: We received the final version of the MFO Biological Assessment and began formal consultation

APPENDIX C.

STATE HISTORIC PRESERVATION OFFICE LETTER OF CONCURRENCE

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Moab Field Office
82 East Dogwood
Moab, Utah 84532

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
8100 (UT-060)

DATE: July 2, 2008

Mathew Seddon
State Historic Preservation Officer
Utah State Historical Society
300 Rio Grande
Salt Lake City, Utah 84101-1182

2008 JUL 22 AM 9:

Case Number: 07-1472

Action: Bureau of Land Management, Moab Field Office Resource Management Plan Proposed Plan/Final EIS

The Moab Field Office has prepared a new Resource Management Plan to guide management of Public Lands. The Proposed Plan/Final EIS is scheduled to be issued in August 2008, with a Record of Decision planned for late October 2008. I have determined that the decisions in this plan will have no adverse effect on historic properties, and request SHPO concurrence with this determination. Please review the enclosed documentation, then sign and return this letter with your comments. Thank you.

Sincerely,

Shelley J. Smith
Moab Field Office Manager

X Concur ___ Do Not Concur

UTAH STATE HISTORIC PRESERVATION OFFICER — DSHPO — DATE 7/10/08

COMMENTS:

Received
JUL 11 2008
USHPO

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APPENDIX D.

UTAH STANDARDS FOR RANGELAND HEALTH AND GUIDELINES FOR GRAZING MANAGEMENT

FUNDAMENTALS OF RANGELAND HEALTH

The Bureau of Land Management has defined four Fundamentals of Rangeland Health, which are the basic ecological principles underlying sustainable production of rangeland resources. These Fundamentals are embodied in BLM's new Grazing Regulation (43 Code of Federal Regulations, Part 4100) which became effective in August of 1995. These four Fundamentals of Rangeland Health, which also serve as the basis for Standards and Guidelines for Grazing Management, are:

1) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian/wetland, and aquatic components; soil and plant conditions support water infiltration, soil moisture storage, and release of water that are in balance with climate and landform, and maintain or improve water quality, water quantity, and timing and duration of flow.

2) Ecological processes, including the hydrologic cycle, nutrient cycles, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

3) Water quality complies with State water quality standards and achieves, or is making progress toward achieving, established BLM management objectives such as meeting wildlife needs.

4) Habitats are, or are making significant progress towards being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Federal Candidate, other special status species, native species, and for economically valuable game species and livestock.

STANDARDS FOR RANGELAND HEALTH

STANDARD 1.

Upland soils exhibit permeability and infiltration rates that sustain or improve site productivity, considering the soil type, climate, and landform.

As indicated by:

a.) Sufficient cover and litter to protect the soil surface from excessive water and wind erosion, promote infiltration, detain surface flow, and retard soil moisture loss by evaporation.

b.) The absence of indicators of excessive erosion such as rills, soil pedestals, and actively eroding gullies.

c.) The appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community (DPC), where identified in a land use plan conforming to these Standards, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes.

STANDARD 2.

Riparian and wetland areas are in properly functioning condition. Stream channel morphology and functions are appropriate to soil type, climate and landform.

As indicated by:

a.) Streambank vegetation consisting of, or showing a trend toward, species with root masses capable of withstanding high streamflow events. Vegetative cover adequate to protect stream banks and dissipate streamflow energy associated with high-water flows, protect against accelerated erosion, capture sediment, and provide for groundwater recharge.

b.) Vegetation reflecting: Desired Plant Community, maintenance of riparian and wetland soil moisture characteristics, diverse age structure and composition, high vigor, large woody debris when site potential allows, and providing food, cover, and other habitat needs for dependent animal species.

c.) Revegetating point bars; lateral stream movement associated with natural sinuosity; channel width, depth, pool frequency and roughness appropriate to landscape position.

d.) Active floordplain.

STANDARD 3.

Desired species, including native, threatened, endangered, and special-status species, are maintained at a level appropriate for the site and species involved.

As indicated by:

a.) Frequency, diversity, density, age classes, and productivity of desired native species necessary to ensure reproductive capability and survival.

b.) Habitats connected at a level to enhance species survival.

c.) Native species re-occupy habitat niches and voids caused by disturbances unless management objectives call for introduction or maintenance of non-native species.

d.) Habitats for threatened, endangered, and special-status species managed to provide for recovery and move species toward de-listing.

e.) Appropriate amount, type, and distribution of vegetation reflecting the presence of (1) the Desired Plant Community (DPC), where identified in a land use plan conforming to these Standards, or (2) where the DPC is not identified, a community that equally sustains the desired level of productivity and properly functioning ecological processes.

STANDARD 4.

BLM will apply and comply with water quality standards established by the state of Utah (r.317-2) and the federal clean water and safe drinking water acts. Activities on BLM lands will fully support the designated beneficial uses described in the Utah water quality standards (r.317-2) for

surface and groundwater.

As indicated by:

a) Measurement of nutrient loads, total dissolved solids, chemical constituents, fecal coliform, water temperature and other water quality parameters.

b) Macro invertebrate communities that indicate water quality meets aquatic objectives.

GUIDELINES FOR GRAZING MANAGEMENT

1) Grazing management practices will be implemented that:

a) Maintain sufficient residual vegetation and litter on both upland and riparian sites to protect the soil from wind and water erosion and support ecological functions;

b) Promote attainment or maintenance of proper functioning condition riparian/wetland areas, appropriate stream channel morphology, desired soil permeability and infiltration, and appropriate soil conditions and kinds and amounts of plants and animals to support the hydrologic cycle, nutrient cycle and energy flow.

c) Meet the physiological requirements of desired plants and facilitate reproduction and maintenance of desired plants to the extent natural conditions allow;

d) Maintain viable and diverse populations of plants and animals appropriate for the site;

e) Provide or improve, within the limits of site potentials, habitat for Threatened or Endangered species;

f) Avoid grazing management conflicts with other species that have the potential of becoming protected or special status species;

g) Encourage innovation, experimentation and the ultimate development of alternatives to improve rangeland management practices; and

h) Give priority to rangeland improvement projects and land treatments that offer the best opportunity for achieving the Standards.

2) Any spring and seep developments will be designed and constructed to protect ecological process and functions and improve livestock, wild horse and wildlife distribution.

3) New rangeland projects for grazing will be constructed in a manner consistent with the Standards. Considering economic circumstances and site limitations, existing rangeland projects and facilities that conflict with the achievement or maintenance of the Standards will be relocated and/or modified.

4) Livestock salt blocks and other nutritional supplements will be located away from riparian/wetland areas or other permanently located, or other natural water sources. It is recommended that the locations of these supplements be moved every year.

5) The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

6) When rangeland manipulations are necessary, the best management practices, including biological processes, fire and intensive grazing, will be utilized prior to the use of chemical or mechanical manipulations.

7) When establishing grazing practices and rangeland improvements, the quality of the outdoor recreation experience is to be considered. Aesthetic and scenic values, water, campsites and opportunities for solitude are among those considerations.

8) Feeding of hay and other harvested forage (which does not refer to miscellaneous salt, protein, and other supplements), for the purpose of substituting for inadequate natural forage will not be conducted on BLM lands other than in (a) emergency situations where no other resource exists and animal survival is in jeopardy, or (b) situations where the Authorized Officer determines such a practice will assist in meeting a standard or attaining a management objective.

9) In order to eliminate, minimize, or limit the spread of noxious weeds, (a) only hay cubes, hay pellets, or certified weed-free hay will be fed on BLM lands, and (b) reasonable adjustments in grazing methods, methods of transport, and animal husbandry practices will be applied.

10) To avoid contamination of water sources and inadvertent damage to non-target species, aerial application of pesticides will not be allowed within 100 feet of a riparian/wetland area unless the product is registered for such use by EPA.

11) On rangelands where a standard is not being met, and conditions are moving toward meeting the standard, grazing may be allowed to continue. On lands where a standard is not being met, conditions are not improving toward meeting the standard or other management objectives, and livestock grazing is deemed responsible, administrative action with regard to livestock will be taken by the Authorized Officer pursuant to CFR 4180.2(c).

12) Where it can be determined that more than one kind of grazing animal is responsible for failure to achieve a standard, and adjustments in management are required, those adjustments will be made to each kind of animal, based on interagency cooperation as needed, in proportion to their degree of responsibility.

13) Rangelands that have been burned, reseeded or otherwise treated to alter vegetative composition will be closed to livestock grazing as follows: (1) burned rangelands, whether by wildfire or prescribed burning, will be ungrazed for a minimum of one complete growing season following the burn; (2) rangelands that have been reseeded or otherwise chemically or mechanically treated will be ungrazed for a minimum of two complete growing seasons following treatment.

14) Conversions in kind of livestock (such as from sheep to cattle) will be analyzed in light of Rangeland Health Standards. Where such conversions are not adverse to achieving a standard, or they are not in conflict with land BLM use plans, the conversion will be allowed.

APPENDIX E.

MOAB RMP MONITORING PLAN

Resource	Goal/Objective	Monitoring
Cultural Resources	Identify, preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations (FLPMA, Section 103(c), 201(a) and (c); National Historic Preservation Act, Section 110(a); Archaeological Resources Protection Act, Section 14(a)). Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses (FLPMA, Section 103(c), National Historic Preservation Act, Sections 106, 110(a)(2)) by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.	Specific management plans would be developed for up to seven culturally sensitive areas unless integrated into other activity plans. These plans would include developing a site monitoring system. Areas to be considered include the Bookcliffs, Dolores Triangle, North Fork and South Fork of Mill Creek, Seven Mile, Ten Mile Wash and its tributaries, Bartlett/Hidden Canyon, and the Hell Roaring uplands. A periodic review of the cultural resource program will be conducted to ensure that the program is meeting established parameters for proactive cultural resources inventory under Section 110 of the National Historic Preservation Act. The number of acres inventoried by BLM under Section 110 will be reported in the Annual Program Summary and Planning Update.
Fire Management	Fire management would adopt the comprehensive Utah Land-use Plan Amendment for Fire and Fuels Management, September 2005 (LUP Amendment; BLM 2005c).	The monitoring program for the MFD includes sampling of established plots within areas treated for hazardous fuel removal as well as BLM lands that have received ES&R treatments. Collection and interpretation of qualitative and quantitative data is ongoing and data is recorded and compiled for analysis. The results from these ongoing analyses are then incorporated into fuels management decisions. For example, monitoring results can influence treatment methods in an area susceptible to invasive species or may determine

Resource	Goal/Objective	Monitoring
		which seed species are most likely to flourish in a particular treatment area. The MFD has also been proactive in collaborating with other federal agencies and local partners to map all fire-affected areas as well as those lands that have been treated with planned fire and non-fire activities. GIS data and maps are now shared among partners to support a landscape-scale approach to hazardous fuels reduction, fire prevention in WUI areas and ESR activities.
Health and Safety	BLM would strive to ensure that human health and safety concerns on public lands remain a major priority	Site clean-ups will be monitored to protect and safeguard human health, restore environmental damage, and limit the BLM's liability. Reclamation and mitigation work done on abandoned mine sites will be monitored to ensure compliance with laws and regulations.
Livestock Grazing	Achieve the attainment of Standards for Rangeland Health and other desired resource conditions by maintaining appropriate utilization levels of the range through management prescriptions and administrative adjustments of grazing permits. Achieve healthy, sustainable rangeland ecosystems that support the livestock industry while providing for other resource values such as wildlife habitat, recreation opportunities, clean water, and functional watersheds.	Identify appropriate utilization levels based on allotment or site-specific management practices, such as season-of-use, grazing intensity and duration, and utilization patterns, as well as vegetative conditions, the presence or absence of range improvements, and resource issues or concerns. Use utilization levels as an indicator to evaluate if current grazing use is appropriate to meet resource objectives for the area. Generally moderate utilization levels (40–60%) would be used to indicate if general management objectives can be met. Utilization levels above those identified as appropriate would be used to adjust livestock use on a yearly basis through pasture and possible early removal from allotments as needed. Utilization levels may be especially important during periods of drought. Long-term adjustments to livestock use (term permits adjustments) require the evaluation of monitoring data including climate, actual grazing use, current or historic impacts, utilization mapping, and long-term trend data, as well as utilization levels. Collect monitoring data, including trend, utilization, actual use, and climate data to determine if existing livestock management practices are meeting land-use planning and resource objectives. BLM policy regarding adjustments to the levels of livestock use authorized is to monitor and inventory range conditions under existing stocking levels and make adjustments to livestock use as indicated by this data to help assure that Rangeland Health Standards (RHS) and resource objectives are met. Regulations at 43 CFR

Resource	Goal/Objective	Monitoring
		4130.3 require that the terms and conditions under which livestock are authorized "ensure conformance with the provisions of subpart 4180" (Standards for Rangeland Health) and further that "livestock grazing use shall not exceed the livestock carrying capacity of the allotment." It would be inappropriate and unfeasible to estimate and allocate the available forage, design specific management practices and determine if changes to the kind of livestock are necessary for each allotment in the Moab Field Office or in the area as a whole in the RMP/EIS. Such changes would not be supportable considering the type and amount of data required and the analysis necessary to make such changes. Grazing will be allowed on a limited basis in Ten Mile Canyon ACEC downstream from Dripping Springs, with changes subject to future monitoring.
Non-WSA Lands with Wilderness Characteristics	Protect, preserve, and maintain wilderness characteristics (appearance of naturalness, outstanding opportunities for primitive and unconfined recreation or solitude) of non-WSA lands with wilderness characteristics as appropriate, considering manageability and the context of competing resource demands. Manage these primitive lands and backcountry landscapes for their undeveloped character, and to provide opportunities for primitive recreational activities and experiences of solitude, as appropriate	Monitor approximately 47,761 acres of non-WSA lands with wilderness characteristics during the months the areas are accessible by the public. These areas may be monitored more frequently if necessary because of potential use activities or other resource conflicts to ensure that naturalness is retained.
Paleontology	Protect paleontological resources from surface-disturbing activities. Promote the scientific, educational, and recreational uses of fossils.	Monitor high-potential areas for paleontological resources to determine condition, impacts, deterioration and use of sites. Monitor areas where collection of petrified wood is prohibited to assess

Resource	Goal/Objective	Monitoring
	Foster public awareness and appreciation of the MPA's paleontological heritage. Promote and facilitate scientific investigation of fossil resources.	condition, impacts, and deterioration of deposits. Scientific research by qualified institutions on paleontological resources will be encouraged.
Recreation	To provide for multiple recreational uses of the public lands and sustain a wide-range of recreation opportunities and potential experiences for visitors and residents, while supporting local economic stability and sustaining the recreation resource base and sensitive resource values.	Recreation monitoring will emphasize developed recreation sites and Special Recreation Management Areas. Monitoring will include checking on signing, visitor use, recreation-related impacts, and user conflicts. Monitoring will emphasize identification of areas where there may be problems with compliance with rules and regulations resulting in user conflicts or resource damage. Monitor recreation activity in the Moab ERMA to maintain recreation opportunities and protect resource values. Monitor recreation visitor numbers on a continual basis. Special Recreation Permits will be monitored for compliance with the terms of the permit.
Riparian	Manage riparian areas for properly functioning condition (PFC) and ensure stream channel morphology and functions are appropriate for local soil type, climate, and landform. Avoid or minimize the disturbance, loss, or degradation of riparian, wetland, and associated floodplains; preserve and enhance natural and beneficial values; and provide for	Camping in riparian areas would be monitored and modified as conditions dictate to reduce vegetation disturbance and sedimentation. Conduct proper functioning condition assessments using the procedures outlined in BLM Technical References 1737-15 and 1737-16.

Resource	Goal/Objective	Monitoring
	fish, wildlife and special status species habitats.	
Soils/Water	Manage watersheds to enhance ecosystem health and provide for public uses. Maintain and improve existing water quality by ensuring that all authorized uses on public lands comply with State water quality standards and with the Colorado River Basin Salinity Control Act. Manage watersheds to maintain or improve soil quality and long-term productivity.	BLM would work with partners to implement Best Management Practices (BMPs) and continue BLM's cooperative work with the Utah Divisions of Water Rights and Water Quality in accordance with the administrative memorandum of understanding (MOU) and the cooperative agreement addressing water quality monitoring. Develop watershed management plans for municipal watersheds to ensure water sources are protected adequately. Monitor municipal water quality/watershed conditions.
Special Designations: Areas of Critical Environmental Concern	The term "Area of Critical Environmental Concern" means areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards (FLPMA, 43 U.S.C. 1702(a)).	Each ACEC will have a management plan prepared for the ACEC that will include a monitoring component. Each of the 5 ACECs will be monitored for the relevant and important values for which they were established at a minimum of once per year. Periodically monitor the impacts of management actions on the relevant and important resource values. Ten Mile Canyon ACEC: Grazing will be allowed on a limited basis in Ten Mile Canyon downstream from Dripping Springs, with changes subject to future monitoring. Ten Mile Canyon ACEC: Permits for motorized recreational use may be required if monitoring indicates long-term damage in Ten Mile Wash.

Resource	Goal/Objective	Monitoring
National Historic Trail: Old Spanish Trail	Ensure compliance with the management actions in the Approved RMP.	Monitoring will be conducted on the Old Spanish Trail in accordance with the *Old Spanish Trail Comprehensive Management Plan.*
Special Designations: Wild and Scenic Rivers	To the extent of the BLM's authority (limited to BLM lands within the river corridor), maintain and enhance the free flowing character, preserve and enhance the outstandingly remarkable values, and allow no activities within the river corridor that would alter the classification of those river segments determined suitable for congressional designation in the NWSRS until Congress acts.	Conduct compliance monitoring to ensure that the outstandingly remarkable values are not compromised on the suitable Wild and Scenic River segments.
Special Designations: Wilderness Study Areas	Preserve the wilderness character of Wilderness Study Areas (WSAs) until Congress designates them wilderness or releases them.	There are two designated routes within the Behind the Rocks and Lost Spring Canyons WSAs totally 1.7 miles. These two routes (0.9 miles within the southeast corner of the Behind the Rocks WSA and 0.8 miles on the west side of the Lost Spring Canyon) will be monitored on a continual basis to ensure that impairment of wilderness values does not occur. If use and/or non-compliance are found to impair the area's suitability for wilderness designation, the BLM would take further action to limit use of the routes, or close them. Monitor approximately 350,000 acres of WSAs during the months the areas are accessible by the public, or more frequently if necessary because of potential use activities or other resource conflicts.
Special Status Species	Maintain, protect, and enhance habitats (including but not limited to designated critical habitat) of Federally listed threatened, endangered, or candidate plant or animal species to actively promote	As required by the Endangered Species Act, monitoring, using approved protocol, would be required on listed and non-listed special status species habitat that may be affected by BLM authorization of any activities within that habitat. As required by the Endangered Species Act, support and implement special

Resource	Goal/Objective	Monitoring
	recovery to the point that they no longer need protection under the Endangered Species Act. Maintain, protect, and enhance habitats of BLM (State) Sensitive plant and animal species to prevent the listing of these species under the Endangered Species Act. Implement management strategies that restore degraded riparian communities; protect natural flow requirements; protect water quality; manage for stable, non-eroding banks; and manage for year-round flows where applicable. Allow or participate in research of threatened and endangered (T&E) and Sensitive species and their habitats. Avoid practices that permanently convert sagebrush shrubland to invasive species.	status plant and animal Species Management Plans. Coordinate actions with UDWR and other involved entities. Support population and habitat monitoring. As required by the Endangered Species Act, support and implement current and future special status plant and animal species Conservation Plans, Strategies, and Agreements. Coordinate actions with USFWS and other involved entities. Support population and habitat monitoring. As of 2005, Conservation Plans Strategies and Agreements include: As required by the Endangered Species Act, develop cooperative agreements with other agencies or entities to inventory and/or monitor existing or potential habitat for listed and non-listed special status plant and animal species. As required by the Endangered Species Act, plan and implement assessment and monitoring plans for T&E and BLM Sensitive species. As required by the Endangered Species Act, allow translocations and population augmentation of special status species to aid in conservation and recovery efforts. Implement necessary habitat manipulations and monitoring to ensure successful translocation efforts. Monitor and protect known Protected Activity Center (PAC) sites according to USFWS recommendations and MSO Recovery Plan. Develop cooperative agreements with other agencies and entities to inventory and monitor existing potential habitat and annually schedule assessment plans of MSO habitat to determine quality of habitat and presence of species. Monitor and protect known nesting sites according to USFWS recommendations and SWFL Recovery Plan. Develop cooperative agreements with other agencies and entities to inventory

Resource	Goal/Objective	Monitoring
		and monitor existing potential habitat and annually schedule assessment plans of SWFL habitat to determine quality of habitat and presence of species. Monitor bald eagle nesting territories annually during breeding season (generally January 1 through August 31). Manage both prairie dog species and their habitats in coordination with the UDWR. Apply habitat management guidance and population monitoring strategies as recommended in the newly developed multi-agency White-tailed and Gunnison's Prairie Dog Management Plan. Develop cooperative agreements with other agencies to inventory prairie dog densities and identify suitable habitat for expansion.
Travel Management	Ensure compliance with management actions in the Approved RMP.	Travel management and OHV use monitoring within the planning area will focus on compliance with specific route and area designations and restrictions with primary emphasis on those routes or areas causing the highest levels of user conflicts or adverse impacts to resources. Monitoring will focus on the travel designation requirement that all motor vehicles remain on designated routes. Monitor the effect of the use of off-road vehicles. On the basis of information so obtained, and whenever necessary, the designations may be amended, revised, revoked, or other action taken. Monitor the White Wash Sand Dunes Open Area to assess the impacts of the managed open area on natural and cultural resources. Modifications to the route system in the Approved RMP will not be considered until implementation of the travel portion of the plan has been substantially completed which includes mapping, signing, monitoring, and evaluation. The process for considering route modifications will be detailed in the Implementation Plan developed for the RMP after completion of the ROD.

Resource	Goal/Objective	Monitoring
		BLM could impose limitations on types of vehicle allowed on specific designated routes if monitoring indicates that a particular type of vehicle is causing disturbance to the soil, wildlife, wildlife habitat, cultural or vegetative resources, especially by off-road travel in an area that is limited to designated roads. The RMP must include indicators to guide future plan maintenance, amendments, or revisions related to OHV area designations or the approved road and trail system within "Limited" areas. Indicators could include results of monitoring data, new information, or changed circumstances (IM 04-005, Attachment 2). Actual route designations within the "Limited" category can be modified without completing a plan amendment, although NEPA compliance is still required.
Vegetation	Manage vegetation resources for desired future conditions (DFC) ensuring ecological diversity, stability, and sustainability, including the desired mix of vegetation types, structural stages, and landscape/riparian function and provide for livestock grazing and for native plant, fish, and wildlife habitats (see Appendix S for Desired Future Conditions for Vegetation). Maintain existing vegetation treatment areas as appropriate. Control invasive and non-native weed species and prevent the introduction of new invasive species by	Monitor the control of invasive and non-native weed species in accordance with national guidance and in cooperation with local weed management plans. Conduct monitoring for new noxious weeds, concentrating in areas where ground disturbing activities have occurred. Visit known noxious weed sites and evaluate for effectiveness of control. Gather necessary vegetation information and continue monitoring to assess if planning objectives are being met. Monitor drought conditions to assess whether drought management actions should be implemented. Monitor trends towards DFC for vegetation using the rangeland health assessment process.

Resource	Goal/Objective	Monitoring
	implementing a comprehensive weed program (as per national guidance and local weed management plans in cooperation with state, federal affected counties), including: coordination with partners; prevention and early detection; education; inventory and monitoring; and using principles of integrated weed management. Manage for vegetation restoration, including control of weed infestations and control of invasive and undesirable nonnative species. Maintain, protect and enhance special status plant and animal habitats in such manner that the potential need to consider any of these species for listing as threatened or endangered under the Endangered Species Act does not arise. Develop management prescriptions for all surface-disturbing resource uses during times of extended drought (see description of Adaptive Drought Management, below). Maintain or enhance the integrity of current sagebrush and sage steppe	

Resource	Goal/Objective	Monitoring
	communities and identify areas in need of restoration. Initiate restoration and/or rehabilitation efforts to ensure sustainable populations of sage-grouse, mule deer and other sagebrush obligate species.	
Visual Resource Management	Manage public lands in a manner that protects the quality of scenic values. Recognize and manage visual resources for overall multiple use, filming, and recreational opportunities for visitors to public lands. Manage BLM actions to preserve those scenic vistas that are most important.	Any project design features or mitigation measures identified to address visual resource management concerns will be monitored to ensure compliance with established VRM classes.
Wildlife and Fisheries	Maintain, protect, and enhance habitats to support natural wildlife diversity, reproductive capability, and a healthy, self-sustaining population of wildlife and fish species. Manage crucial, high-value, and unfragmented habitats as management priorities.	Support and implement current and future animal species Conservation Plans, Strategies and Agreements. Coordinate actions with UDWR and other involved entities. Support population and habitat monitoring. In conjunction with other federal and state agencies, monitor wildlife populations. Assess quality and quantity of crucial, high-value, and unfragmented habitats, including riparian zones and sagebrush steppe communities.
Woodlands	Provide woodland products on a sustainable basis consistent with	Monitor small-sale public use permits to ensure compliance. Monitor areas where woodland harvest is prohibited to ensure compliance.

Resource	Goal/Objective	Monitoring
	maintaining ecosystem health and other resource management objectives to meet local needs where such use does not limit the accomplishment of goals for the management of other important resources.	

APPENDIX F.

TENTATIVE IMPLEMENTATION SCHEDULE

Fiscal Year 2009	
Lead Program	**Action**
Cultural	Complete one cultural management plan. Conduct Class III inventory for one Cultural ACEC.
Livestock Grazing	Complete four assessments and determinations for Rangeland Health to identify utilization levels and management practices such as grazing intensity and duration and season of use. Develop Allotment Management Plans (AMPs) for two of the allotments identified for AMPs in the RMP.
Recreation	Complete draft of River Management Plan for the Colorado River from the Colorado State Line to Castle Creek, and for the Dolores River. Complete a draft Recreation Area Management Plan (RAMP) for one SRMA.
Riparian	Evaluate one riparian area identified in the RMP for Proper Functioning Condition using Standards for Rangeland Health and Guidelines for Livestock Grazing.
Soils and Water	Develop one Watershed Management Plan for a watershed identified in the RMP.
Travel	Complete closing of non-designated ways within Wilderness Study Areas utilizing barriers and/or signs. Produce BLM maps of designated routes for public use within the Moab planning area. These maps would be available on the website, as well as in hard copy and electronic versions. Provide data to commercial map makers to facilitate early revision of their maps to conform with the Travel Plan. Post travel maps at key entry points to BLM lands. Complete on-the-ground marking of designated travel routes in two high priority use areas.
Vegetation	Reclaim and restore up to 50,000 acres of sagebrush habitat and shrub-steppe ecosystems.
Woodlands	Produce map of areas available and not available for woodland harvest.
Fiscal Year 2010	
Lead Program	**Action**
Cultural	Complete one cultural management plan. Conduct Class III inventory for one Cultural ACEC.
Livestock Grazing	Complete four assessments and determinations for Rangeland Health to identify utilization levels and management practices such as grazing

	intensity and duration and season of use. Develop Allotment Management Plans (AMPs) for two of the allotments identified for AMPs in the RMP.
Recreation	Complete River Management Plan for the Colorado River from the Colorado State Line to Castle Creek, and for the Dolores River. Complete one Recreation Area Management Plan for one SRMA. Complete draft of one Recreation Area Management Plan for an SRMA.
Riparian	Evaluate one riparian area identified in the RMP for Proper Functioning Condition using Standards for Rangeland Health and Guidelines for Livestock Grazing.
Soils and Water	Develop one Watershed Management Plan for a watershed identified in the RMP. Develop BMPs to address health and safety concerns with blowing dust along U.S.191 and I-70.
Travel	Complete on-the-ground marking of designated travel routes in two high priority use areas. Commence marking of routes in the Dee Pass Motorized Focus Area. Complete marking of designated routes within non-WSA lands with Wilderness Characteristics.
Vegetation	Reclaim and restore up to 50,000 acres of sagebrush habitat and shrub-steppe ecosystems.
Fiscal Year 2011	
Lead Program	**Action**
Cultural	Complete one cultural management plan. Conduct Class III inventory for one Cultural ACEC.
Livestock Grazing	Complete four assessments and determinations for Rangeland Health to identify utilization levels and management practices such as grazing intensity and duration and season of use. Develop Allotment Management Plans (AMPs) for two of the allotments identified for AMPs in the RMP.
Recreation	Complete one Recreation Area Management Plan for one SRMA. Complete draft of two Recreation Area Management Plans for two SRMAs.
Riparian	Evaluate one riparian area identified in the RMP for Proper Functioning Condition using Standards for Rangeland Health and Guidelines for Livestock Grazing.
Soils and Water	Develop one Watershed Management Plan for a watershed identified in the RMP.

	Develop BMPs for activities on saline and other sensitive soils.
Travel	Complete on-the-ground marking of designated travel routes in two high priority use areas. Sign and fence (if necessary) the White Wash Managed Open Area. Commence marking of routes in the Utah Rims area.
Vegetation	Reclaim and restore up to 50,000 acres of sagebrush habitat and shrub-steppe ecosystems.
Fiscal Year 2012	
Lead Program	**Action**
Cultural	Complete one cultural management plan.
Livestock Grazing	Complete four assessments and determinations for Rangeland Health to identify utilization levels and management practices such as grazing intensity and duration and season of use. Develop Allotment Management Plans (AMPs) for two of the allotments identified for AMPs in the RMP.
Recreation	Complete one Recreation Area Management Plan. Complete draft of two Recreation Area Management Plan
Riparian	Evaluate one riparian area identified in the RMP for Proper Functioning Condition using Standards for Rangeland Health and Guidelines for Livestock Grazing.
Soils and Water	Develop Watershed Management Plan for one priority area. Develop BMPs for road maintenance and construction in floodplains, riparian areas, or areas with sensitive soils.
Travel	Complete on-the-ground marking of designated travel routes in two high priority use areas. Complete marking of Dee Pass area and of Utah Rims area.
Vegetation	Reclaim and restore up to 50,000 acres of sagebrush habitat and shrub-steppe ecosystems.
Fiscal Year 2013	
Lead Program	**Action**
Cultural	Complete one cultural management plan.
Livestock Grazing	Complete four assessments and determinations for Rangeland Health to identify utilization levels and management practices such as grazing intensity and duration and season of use. Develop Allotment Management Plans (AMPs) for two of the allotments identified for AMPs in the RMP.
Recreation	Complete one Recreation Area Management Plan. Complete draft of one Recreation Area Management Plan and the ERMA

	plan.
Riparian	Evaluate one riparian area identified in the RMP for Proper Functioning Condition using Standards for Rangeland Health and Guidelines for Livestock Grazing.
Soils and Water	Develop Watershed Management Plan for one priority area.
Travel	Complete on-the-ground marking of designated routes in the Moab planning area.
Vegetation	Reclaim and restore up to 50,000 acres of sagebrush habitat and shrub-steppe ecosystems.

APPENDIX G.
LAND TENURE ADJUSTMENTS AND WITHDRAWAL CRITERIA

G. 1
LAND TENURE ADJUSTMENT CRITERIA

G.1.1.DISPOSAL CRITERIA (GENERAL)

1. Lands can be considered for disposal if they meet criteria described in Sections 203 & 206 of the Federal Lands Policy and Management Act of 1976 (FLPMA).
2. Lands with mining claims can be considered for disposal if the following apply: (a) the new surface owner is the mining claimant, or (b) the new surface owner agrees to accept the surface with the claim encumbrance.
3. Lands can be considered for disposal that are not encumbered by a withdrawal or other special designation.
4. Lands can be considered for disposal if disposal would not adversely impact National Register–eligible cultural sites unless mitigated.
5. Lands can be considered for disposal if they are not suitable for management by another Federal department or agency.
6. Lands in floodplains or containing wetlands can be considered for disposal if the BLM would acquire more or higher quality floodplains, wetlands, or riparian areas.
7. Lands listed in Appendix I and other lands not within specially designated areas can be considered for disposal, as necessary, to facilitate an exchange.
8. Lands will not be considered for disposal if they have: (a) any habitat for listed, endangered or special status species or (b) any habitat for any non-listed species if such action could lead to the need to list any species as threatened or endangered.
9. Lands in WSAs, ACECs, and SRMAs and other designated areas will be retained.
10. Lands identified for disposal that meet FLPMA Sec. 203 criteria are listed by tract in Appendix I, and are shown on Map 7.

G.1.2. ACQUISITION CRITERIA (GENERAL)

1. Acquired lands would meet program objectives for management of recreation resources, wilderness, cultural resources, wildlife habitat, riparian or wetland areas, or threatened or endangered species.
2. Acquisition would result in better Federal land management.
3. Where possible, acquisition would provide access to public lands.
4. Acquisitions through purchase or donation should meet general acquisition criteria.

G.1.3.EXCHANGES

To be in conformance with the plan, lands considered for disposal through FLPMA Section 206 must:

1. Be shown to be in the public interest and

2. Meet general disposal and acquisition criteria shown above.

Further, the resource values of acquisition must outweigh the resource values of disposal.

G.1.4. RECREATION AND PUBLIC PURPOSES (R&PP) ACT DISPOSALS

1. Lands are needed for community expansion.
2. Lands are needed for a public facility that cannot be accommodated on non-federal land.

G.2.
WITHDRAWAL CRITERIA

G. 2.1. NEW WITHDRAWALS

New withdrawals would be considered if:

1. Other methods are not available to protect valuable resources or
2. A withdrawal is necessary to transfer jurisdiction of lands to another federal agency.

G.2.2. WITHDRAWAL REVIEW

Review existing withdrawals on a case-by-case basis. Determine whether the use is consistent with the intent of the withdrawal and whether the withdrawal should be continued, modified, revoked or terminated. If it is determined by a withdrawal review that a withdrawal should be revoked or terminated, or a withdrawal expires, the land does not automatically open to operation of the law(s) to which the land was closed. An opening order will be published to notify the public when and to what extent the land will be opened. An opening order may be incorporated in a public land order or termination order that revokes or terminates a withdrawal or may be published in the Federal Register as a separate document. Any land becoming unencumbered by withdrawals will be managed in a manner consistent with adjacent or comparable public land within the planning area.

G.2.3.WITHDRAWAL REVOCATION

Following revocation of a withdrawal, the lands would be managed according to other provisions for these lands as specified in this RMP.

APPENDIX H.

FILM PERMITS: MINIMUM IMPACT CRITERIA

Filming is allowed in all areas provided the following criteria are met:

H .1

MINIMUM IMPACT CRITERIA FOR ALL BLM LANDS

1. Project would not adversely impact sensitive habitat or species.
2. Project would not adversely impact Native American sacred site(s) and/or National Register eligible sites.
3. Project does not involve use of pyrotechnics more than a campfire in an appropriate setting.
4. Filming allowed in all areas, provided impacts to land, air, or water can be avoided, mitigated, or reclaimed.
5. Project does not involve use of explosives.
6. Project, involving use of exotic animal species, includes provisions for containment and/or capture of animals.
7. Project does not involve extensive restriction of public access.
8. Limited filming would be allowed in areas with the following sensitive resources provided that impacts to these sensitive resources can be avoided, mitigated, or reclaimed:
    a. Historic, Cultural or Paleontological sites
    b. Sensitive soils
    c. Relict environments
    d. Wetlands, floodplains, or riparian areas
    e. Water quality
    f. Wildlife habitat
9. Use of heavy equipment would be allowed provided that any resource damage can be avoided, mitigated, or reclaimed.
10. Criteria for use of aircraft (helicopter, fixed wing, hot air balloons):
    a. No refueling requested within WSAs and Designated Wilderness Areas.
    b. Use of aircraft in an area with wildlife concerns would be allowed if a survey or inventory by an approved biologist demonstrates that animals are not present, or, if animals are present, aircraft use is not proposed for more than one day and does not exceed the frequency of 2 projects per 30-day period.
    c. Use of aircraft in areas with outstanding recreational opportunities, Wilderness Study Areas, designated Wilderness, or close to residential areas is proposed for no more than 2 days and does not exceed the frequency of 3 two-day projects per 30-day period.
    d. Aircraft use proposed within ½ mile of any designated campground would be during low-use times (i.e. weekdays and not during major holidays between 8:00 a.m. and 6:00 p.m.)

H.2
Additional Minimum-Impact Criteria for the Following Areas: Designated Wilderness, WSAs

1. Project does not involve use of more than 20 livestock in these locations. Impacts from livestock can be avoided, mitigated, or reclaimed.
2. Project does not involve 15 or more production vehicles. Vehicles would only be allowed on Wilderness Study Areas or designated Wilderness boundary roads.
3. Project does not involve 50 or more people within these areas.
4. The activity within these areas would not continue in excess of 10 days.

If filming projects do not meet the criteria listed above, site-specific NEPA will be required.

APPENDIX I.

LANDS IDENTIFIED FOR DISPOSAL IN THE MOAB RMP

The parcels listed below meet FLPMA Section 203 criteria for disposal by sale. These lands can also be considered for disposal under FLMPA Section 206 exchange or under the Recreation and Public Purposes Act (R&PP). See Map 7. However, Section 206 exchanges and R&PP disposals are not limited to this list if they meet the criteria for disposal outlined in Appendix A of this plan.

Parcel #*	Legal Description		Acres
R-1	T. 20 S., R. 16 E.	sec. 21, SE¼SW¼	40.00
		sec. 23, SW¼NW¼	40.00
		sec. 25, All	640.00
		sec. 26, SW¼SW¼, W½SW¼, SE¼	280.00
		sec. 27, SE¼SE¼	40.00
		sec. 28, lot 2, E½NW¼, S½	439.84
		sec. 33, lots 1-3, NE¼, E½NW¼, NE¼SW¼, N½SE¼	488.70
		sec. 34, W½NW¼	80.00
	T. 21 S., R. 16 E.	sec. 1, lots 1, 4, 5, 8, 9, 12, 13, 16	263.00
		sec. 3, lot 25	70.16
		sec. 12, S½SE¼	80.00
		sec. 13, NE¼NE¼	40.00
	T. 21 S., R. 17 E.	sec. 4, lots 11-14, N½SW¼, SW¼SW¼, NW¼SE¼, SE¼SE¼	360.00
		sec. 5, E½SE¼	80.00
		sec. 6, lots 2, 3, 4, 5, 7, 10	271.73
		sec. 7, lot 4, SE¼SW¼, SE¼	233.94
		sec. 8, NW¼SW¼, SE¼SW¼, SE¼	240.00
		sec. 9, NE¼, N½NW¼, SW¼NW¼, S½	600.00
		sec. 17, N½, N½S½, S½SW¼	560.00
		sec. 18, lots 1-4, E½W½, E½	615.60
		sec. 19, lot 1, E½NW¼, E½	434.03
		secs. 20, 21, All	1280.00
		sec. 22, N½NE¼, SW¼NW¼, E½SW¼, SE¼SW¼, S½SE¼	320.00
R-2	T. 21 S., R. 16 E.	sec. 22, NE¼SE¼	40.00
		sec. 23, SW¼, W½SE¼, SE¼SE¼	280.00
		sec. 25, NW¼, S½	480.00
		sec. 26, All	640.00
		sec. 35, N½, E½SW¼, SE¼	560.00
	T. 21 S., R. 17 E.	sec. 30, lot 4	35.40
R-3	T. 21 S., R. 20 E.,	sec. 21, N½NE¼	20.00
R-4	T. 19 S., R. 23 E.,	sec. 7, SW¼NE¼SW¼	10.00

R-5	T. 20 S., R. 24 E.,	sec. 18, SW¼NE¼, W½SE¼, SE¼SE¼	160.00
R-6	T. 21 S., R. 23 E.,	sec. 23, NE¼SE¼	40.00
R-7	T. 21 S., R. 24 E.,	sec. 27, E½NW¼SE¼, NE¼SW¼SE¼	30.00
		sec. 34, NE¼NE¼NE¼NE¼	2.50
		sec. 35, NE¼NW¼NW¼, N½NW¼NW¼NW¼, SE¼NW¼NW¼NW¼	17.50
R-8	T. 23 S., R. 19 E.,	sec. 14, N½NW¼, SW¼, E½	560.00
		sec. 15, All	640.00
		sec. 22, All	640.00
		sec. 23, All	640.00
R-9	T. 24 S., R. 23 E.,	sec. 21, within SE¼SE¼	3.51
		sec. 22, within NE¼SW¼, SW¼SE¼	3.85
		sec. 27, within NE¼NW¼NW¼	2.58
		NE¼NW¼SW¼NE¼, N½NE¼SW¼NE¼	7.43
R-10	T. 26 S., R. 21 E	sec. 12, lots 2, 6, NE¼ of lot 11, 12	129.25
		sec. 13, lot 1	22.47
	T. 26 S., R. 22 E	sec. 18, lot 1	39.23
		sec. 20, lot 1	39.47
		lot 89 (excluding the W½NW¼, SE¼NW¼, SW¼, and W½SE¼ of the lot)	17.12
		lot 8 (NE¼)	10.00
		NE¼NW¼NW¼, N½NW¼NW¼NW¼	15.00
		sec. 27, NW¼SW¼, N½SW¼SW¼, N½SW¼SW¼SW¼ SE¼SW¼SW¼SW¼, SE¼SW¼SW¼	77.50
		sec. 28, lot 6,	9.36
		SE¼NE¼, NE¼SW¼NE¼, E½NE¼SE¼	70.00
		sec. 34, W½NE¼, E½NE¼NW¼, NW¼NE¼NW¼ N½SW¼NE¼NW¼, N½NE¼NW¼NW¼ SE¼NE¼NW¼NW¼, E½NE¼SE¼NW¼ NE¼NW¼SE¼, NE¼NW¼NW¼SE¼ N½SE¼NW¼SE¼, SE¼SE¼NW¼SE¼ N½SE¼SE¼, N½SW¼SE¼SE¼ SE¼SW¼SE¼SE¼, SE¼SE¼SE¼	185.00
		sec. 35, SW¼SW¼	40.00
	T. 27 S., R. 22 E	sec. 2, lots 3 and 4, SE¼NW¼	126.82
		sec. 11, N½NE¼NE¼, N½SW¼NE¼NE¼ SE¼SW¼NE¼NE¼, SE¼NE¼NE¼	37.50
		sec. 12, SW¼NW¼	40.00

R-11 Has been deleted from the disposal list.

R-12	T. 28 S., R. 23 E	sec. 31, SE¼NW¼	40.00
R-13	T. 23 S., R. 17 E.,	sec. 31, NW¼NE¼, S½NE¼, E½SE¼	200.00

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APPENDIX J.

LETTER FROM THE STATE OF UTAH REGARDING AIR QUALITY MITIGATION STRATEGIES

State of Utah
JON M. HUNTSMAN, JR. *Governor*
GARY R. HERBERT *Lieutenant Governor*

June 6, 2008

Selma Sierra
State Director
BLM Utah State Office
P.O. Box 45155
Salt Lake City, Utah 84145-0155

Dear Director Sierra:

This letter addresses air quality mitigation strategies for the six proposed Resource Management Plans being updated within the State of Utah. The state appreciates BLM's interest in this important issue.

It is the policy of the State of Utah to protect public health and the environment from the harmful effects of air pollution, to ensure that the air in Utah meets standards established under federal and state law, and to maintain an environment that is conducive to continued economic vitality and growth.

The Department of Interior monitors ozone at National Parks in the intermountain west, including: Mesa Verde National Park in Colorado, Grand Canyon National Park in Arizona, Great Basin National Park in Nevada, and Canyonlands National Park in Utah. These sites reflect conditions in areas that have not been subject to intensive development and are therefore generally indicative of background conditions. Monitoring data at these locations demonstrates a gradual upward trend in ozone levels, raising questions about ozone levels region-wide. The state believes additional information is needed regarding current conditions and the potential impacts from increasing development activity, including oil and gas activity. This information should inform future BLM decision making, but managers should not defer management actions in anticipation of better information.

Fortunately, ozone related impacts can be reduced if certain mitigation measures are required on new oil and gas related emission sources. In fact, several neighboring states currently encourage application of just such measures. BLM should include interim nitrogen oxide control measures provided by the state as a required condition of lease approval. These control measures are consistent with control measures suggested by neighboring states and jurisdictions. The state recognizes that performance standards will continue to evolve and supports technological flexibility, provided control measures are at least as effective as those in place elsewhere within the region at the time of site-specific authorization. Performance standards representing the current regional standard can be

found in the *Four Corners Air* - 2 - *Quality Task Force Report of Mitigation Options, DRAFT: Version 7*, June 22, 2007. These standards are 2 g/bhp-hr for engines less than 300 HP and 1 g/bhp-hr for engines over 300 HP.

The State of Utah will continue to work with the BLM and others through efforts such as the Four Corners Task Force to address these issues. The state appreciates your cooperation in working to protect air quality related values. If you have any questions about our position, please contact me at (801) 537-9802.

Sincerely,

John Harja
Cheryl Heying
Public Lands Policy Coordination Division of Air Quality
5110 State Office Building 150 North, 1950 West
Salt Lake City, Utah 84114-1107 Salt Lake City, Utah 84114
(801) 537-9802 (801) 536-4000

APPENDIX K.

IDENTIFICATION OF WILDERNESS CHARACTERISTICS ON NON-WSA LANDS MANAGED BY MOAB BLM

K1. BACKGROUND

The BLM's manual for wilderness inventory, "Wilderness Inventory and Study Procedures Handbook" (H-1630-1), was rescinded on September 29, 2003 by Bureau of Land Management (BLM) Instruction Memorandum 2003-274, "BLM Implementation of the Settlement of Utah v. Norton Regarding Wilderness Study". On October 23, 2003, Instruction Memorandum 2003-275, Change 1, "Consideration of Wilderness Characteristics in Land Use Plans," was issued and became the sole guidance for the consideration of non-WSA lands with wilderness characteristics in the land use planning process until the revised Land Use Planning Handbook was published in 2005. Instruction Memorandum 2003-275, Change 1 states that "the BLM may consider information on wilderness characteristics, along with information on other uses and values, when preparing land use plans." The guidance also states that the consideration of non-WSA lands with wilderness characteristics in the land use planning process has the potential for three distinct outcomes:

1) to give priority to other uses over the protection of wilderness characteristics;
2) to give priority to other uses but applying management restrictions to protect some or all of the wilderness characteristics; or
3) to give priority to the protection of wilderness characteristics.

The current BLM Land Use Planning Handbook (H-1601-1, 2005) states that land use plans must:

> Identify decisions to protect or preserve wilderness characteristics (naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive and unconfined recreation). Include goals and objectives to protect the resource and management actions necessary to achieve these goals and objectives. For authorized activities, include conditions of use that would avoid or minimize impacts to wilderness characteristics.

The Land Use Planning Handbook also authorizes the BLM to consider wilderness proposals from the public during the land use planning process.

Prior to scoping for the Moab RMP, the BLM had received new information from the Southern Utah Wilderness Alliance (SUWA) concerning several areas, using guidelines from the now rescinded "Wilderness Inventory and Study Procedures Handbook". In response to this information, Moab BLM's Interdisciplinary Team reviewed the new information in conjunction with other available information, and made findings regarding the existence of non-WSA lands with wilderness characteristics. For three areas (Mexico Point, Hideout Canyon, Hells Hole), BLM concluded that there was a reasonable probability that these areas contained at least 5000 acres of non-WSA lands possessing wilderness characteristics. The areas were not reviewed in total – just the portions of the areas potentially affected by the actions proposed at the time of the interdisciplinary review. For two other areas, BLM found that the relatively small portions

potentially affected by the specific actions proposed at the time of the interdisciplinary review lacked wilderness characteristics. The remainder of these areas were not considered.

During scoping for the Moab RMP Revision, SUWA provided information to Moab BLM concerning that organization's wilderness proposals. In a document received December 30, 2003, SUWA identified all the areas encompassed in the proposed Redrock Wilderness Act as possessing wilderness characteristics, with the promise that additional information would be provided for areas not already established by BLM as wilderness study areas (WSAs) or as wilderness inventory areas (WIAs) with wilderness characteristics (*1999 Utah Wilderness Inventory*). In the December 30, 2003 communication, no information other than a list of the names of the proposed areas was provided. This list remains the only information on these areas received by BLM from SUWA specific to wilderness characteristics. However, SUWA did provide Moab BLM with proposals for creation of Areas of Critical Environmental Concern (ACECs), in which SUWA suggested wilderness characteristics as one of the values needing protection. All of the areas in the Moab Field Office that were identified by SUWA as being in the proposed America's Redrock Wilderness Act were included in these ACEC proposals.

K.2.2. Overview of Wilderness Characteristics Identification Process Subsequent to Receiving Scoping Comments on the RMP Revision

Moab BLM used an interdisciplinary team to review all the SUWA-proposed wilderness areas that had not been already established as WSAs or inventoried in the *1999 Utah Wilderness Inventory*. All five of the areas that had previously been reviewed in part were now reviewed in total.

In addition to reviewing digital aerial photos from 2006, BLM used other GIS information including county road data (previously verified as part of travel plan formulation), county intrusion data, and BLM files for such resource uses as range improvements and community pits. The review identified impacted areas, as well as those areas that appeared relatively free of impacts on naturalness. Moab BLM also made field trips to many of the areas. For these areas, the GIS review was used to confirm the field data.

IM 275-Change 1, unlike the revoked *Wilderness Inventory and Study Procedures Handbook*, does not mention size as an essential wilderness characteristic. However, Moab BLM took into consideration the language of the 1964 Wilderness Act, and concluded that a size criterion is an important indicator of whether or not outstanding opportunities for solitude and/or primitive recreation exist. Areas of less than 5,000 acres are generally not large enough to provide for these opportunities. Also, because the size criterion had been used for all previous wilderness inventories, applying it here allowed for consistency in both application and findings. BLM used the same criteria for determining Wilderness Characteristics as in the 1979 wilderness inventory. The 5,000 acre value was helpful to BLM in making preliminary judgments but it was not considered a limiting factor.

The size criterion of 5,000 acres was applied only to "stand-alone" units; that is, units not contiguous with other federal lands previously determined to possess wilderness characteristics (including designated wilderness, WSAs, WIAs with wilderness characteristics, and National Park Service and U.S. Forest Service lands that are administratively endorsed for wilderness). Units that are contiguous to federal lands with wilderness characteristics as identified above were

evaluated for naturalness alone. Opportunities for solitude and primitive recreation were assumed to be present in association with the larger contiguous area.

The acreage described in the following tables, when added to acreage within Wilderness Study Areas, encompasses the totality of acreage included in external wilderness proposals as of September 30, 2003.

Table K.1 presents the lands inventoried in the *1999 Utah Wilderness Inventory (revised 2003),* and BLM findings regarding wilderness characteristics.

Table K.1. Non-WSA Lands Inventoried in the *1999 Wilderness Inventory* (*revised 2003),* Total Acreage, and Acreage with and without Wilderness Characteristics

Name (areas marked with an asterisk are contiguous with a WSA of the same name)	Total Acreage of Inventoried Unit	Acreage with Wilderness Characteristics (WC)	Total BLM[1] Acres not Brought Forward (NWC)	Acres Lacking Naturalness[2]	Acres Not Practicable to Manage for Wilderness Characteristics[3]
Beaver Creek	33,357	25,722	7,635	5,539	2,096
*Behind the Rocks	7,961	3,381	4,580	4,578	2
*Coal Canyon	15,229	13,951	1,278	1,269	9
*Desolation Canyon	10,690	10,498	192	0	192
Fisher Towers	17,095	16,668	427	414	13
*Floy Canyon	12,228	9,983	2,245	0	2,245
*Flume Canyon	5,344	3,520	1,824	500	1,281
Goldbar	12,876	6,106	6,770	6,602	168
Gooseneck	5,540	805	4,735	4,735	0
Granite Creek	5,328	4,528	800	800	0
Harts Point (MFO)	5404	1,465	3,939	3,939	0
Hatch Wash	24,096	10,983	13,113	12570	543
Hunter Canyon	4,492	4,465	27	27	0
Labyrinth Canyon	68,717	24,832	43,885	43,885	0
*Lost Spring Canyon	12,661	11,456	1,205	1,160	45
Mary Jane Canyon	25,158	24,748	410	410	0
*Mill Creek Canyon	6,684	3,388	3,296	3,296	0
*Negro Bill Canyon	13,724	2,324	11,400	11,400	0
Shafer Canyon	3,045	1,842	1,203	1,203	0
*Spruce Canyon	2,213	1,131	1,082	0	1,082
*Westwater Canyon	2,328	2,328	0	0	0
Westwater Creek	9,100	7,188	1,912	1,912	0

[1] Although the 1999 inventory evaluated State lands for wilderness character, BLM has no authority to manage such areas for wilderness characteristics. Therefore, no State lands are being carried forward into the DEIS.

[2] Acreage found lacking naturalness either as part of the 1999 inventory findings, or by post-inventory field checks and reported in the 2003 revision document.

[3] Most of this acreage consists of public lands found to possess naturalness, but cut off from the larger unit (usually a WSA) by State lands, resulting in a lack of size as a stand-alone unit sufficient to provide these opportunities.

Table K.1. Non-WSA Lands Inventoried in the *1999 Wilderness Inventory* (*revised 2003),* Total Acreage, and Acreage with and without Wilderness Characteristics

Name (areas marked with an asterisk are contiguous with a WSA of the same name)	Total Acreage of Inventoried Unit	Acreage with Wilderness Characteristics (WC)	Total BLM[1] Acres not Brought Forward (NWC)	Acres Lacking Naturalness[2]	Acres Not Practicable to Manage for Wilderness Characteristics[3]
Totals	**303,270**	**191,312**	**111,958**	**104,239**	**7676**

Table K.2 displays all other non-WSA lands currently proposed for wilderness, and findings by the BLM Interdisciplinary review team.

Table K.2 Other Non-WSA Lands Proposed for Wilderness: Total Acreage, and Acreage with and without Wilderness Characteristics

External Proposal Area (Name)	Total Acres[4]	Acres possessing Wilderness Characteristics (WC)[5]	Acres not having Wilderness Characteristics (NWC)	Comments
Arches Adjacent	11,650	6,396	5,254	Adjacent to NPS/AE or WIA with WC
Beaver Creek	9,294	0	9,294	Adjacent to WIA with WC
Behind the Rocks	286	262	24	Adjacent to WIA with WC or WSA
Big Triangle	20,542	5200	15,342	Stand-alone unit
Coyote Wash	28,069	0	28,069	Heavily impacted by past mining activities, especially uranium.
Dead Horse Cliffs	2,346	797	1549	Adjacent to WIA with WC and NPS unit
Diamond Canyon	15,467	7,681	7,783	Adjacent to WIA with WC and WSA
Dome Plateau	25,818	14,207	11,611	Adjacent to WIA with WC or WSA or NPS unit;
Duma Point	14,698	0	14,698	Stand-alone unit; heavily impacted by roads, past mining activities, and OHV routes.
Fisher Towers	1,740	567	1173	Adjacent to WIA with WC
Goldbar Canyon	435	331	104	Adjacent to WIA with WC
Gooseneck	53	38	15	Adjacent to WIA with WC

[4] Public lands managed by Moab Field Office. Excludes acreage encompassed by State lands, Wilderness Study Areas, and lands inventoried in 1999 and found by BLM to lack wilderness character.
[5] Acres judged by BLM as likely to possess wilderness characteristics.

Table K.2 Other Non-WSA Lands Proposed for Wilderness: Total Acreage, and Acreage with and without Wilderness Characteristics

External Proposal Area (Name)	Total Acres[4]	Acres possessing Wilderness Characteristics (WC)[5]	Acres not having Wilderness Characteristics (NWC)	Comments
Hatch/Lockhart/ Hart	46,729	2,670	44,059	Shared boundary with BLM Monticello Field Office
Hells Hole	2,540	2,538	2	Stand-alone unit; proposal shared by 4 BLM offices
Hideout Canyon	12,269	11,607	662	Stand-alone unit; RPD completed addressing entire unit
Horsethief Point	14,172	8,358	5,814	Adjacent to NPS unit with AE
Labyrinth Canyon	21,189	529	20660	Adjacent to WIA with WC
Mary Jane Canyon	86	31	55	Adjacent to WIA with WC
Mexico Point	13,597	12,837	760	Stand-alone unit; RPD completed addressing entire unit
Mill Creek Canyon	1,028	0	1,028	
Morning Glory	96	6	90	Adjacent to WIA with WC or WSA
Porcupine Rim	67	3	64	Adjacent to WIA with WC or WSA
Renegade Point	6,635	0	6,635	Stand-alone unit
Survey Point	10	0	10	
Westwater	4,509	758	3751	
Yellow Bird	2,212	357	1855	Adjacent to WIA with WC or NPS unit
Totals	255,537	75,173	180,361	

A complete record of findings regarding non-WSA lands with wilderness characteristics can be found in the Administrative Record accompanying the Moab RMP Revision.

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APPENDIX L.
MOAB FIELD OFFICE RECREATION RULES

L.1 CAMPING

L.1.1 CAMPING IN RESTRICTED AREAS

Camping is restricted to improved recreation sites (i.e., campgrounds or camping areas) with facilities managed for overnight use. Fires are restricted to metal fire grills provided at the campgrounds. When camping in areas with developed facilities, camping is restricted to designated sites. Collection of firewood is prohibited (Colorado Riverway, Sand Flats, Ken's Lake/Flat Pass Highway 313 corridor, including road to Canyonlands National Park). Where indicated, camping in areas without developed facilities is restricted to designated, undeveloped campsites. Campers are required to carry out solid human body waste (unless toilets are provided), and must possess and utilize a toilet system that allows for the disposal of such waste through authorized sewage systems. Fires are restricted to the designated site, and collection of firewood is prohibited. The controlled camping areas (some of which may have zero sites designated) are: Bartlett/Courthouse/Dubinky area, Long Canyon road corridor, Gemini Bridges road corridor and within Little Canyon, Seven Mile Canyon, the BLM land west of Arches National Park, Blue Hill-Black Ridge area, Utah Rims, White Wash Sand Dunes, Ten Mile Wash (Dripping Spring Area), Mill Creek Canyon Management Area, areas within Spanish Valley, Kane Creek Crossing, land surrounding developed recreation areas in the Canyon Rims Recreation Area, the corridor of the Green River “Daily”. As campgrounds are constructed in the above or in other areas, camping would be restricted to improved recreation sites (i.e., campgrounds or camping areas) with facilities managed for overnight use.

L.1.2 DISPERSED CAMPING

In all other locations, dispersed camping is permitted on public land. Vehicles associated with such camping are restricted to the designated road system. Campers are required to clean up their campsites. When damage to an area from dispersed camping becomes obtrusive, that area would be added to the "controlled camping" category, where camping is restricted to designated, undeveloped campsites with rules as outlined above. Obtrusive can refer to any or all of the following problems: human sanitation, trash, hacked trees, trampled vegetation and fire danger from excessive campfires.

L.1.3 RIVER-TRIP CAMPING

Campers on all overnight river trips (Colorado, Green and Dolores Rivers) must carry out all solid human waste, campfire ash, and charcoal and dispose of them properly. Solid human body waste must be disposed of in authorized sewage systems. All overnight boating trips must possess a durable metal fire pan at least 12 inches wide with a 1.5-inch lip, and restrict all fires to this fire pan. Collection of firewood is prohibited, except for driftwood. Campers in Westwater Canyon are restricted to designated sites, which are assigned at the Ranger Station. In addition, no camping is allowed for a distance of two miles below Cisco Landing. Campers on the

Colorado River "Daily" must camp in the campgrounds provided if camping on the south side of the river.

L.2 CAMPSITE USE LIMITATIONS

Campsite occupancy is limited to posted numbers of vehicles and persons within campgrounds, camping areas, and controlled camping areas.

L.3 FEES

Fees may be charged for any and all campgrounds on BLM administered land, and within the following areas: Colorado Riverway, Sand Flats, Westwater Canyon of the Colorado River, the Green River, the Dolores River, and on the Kokopelli's Trail.

L.4 OCCUPANCY STAY LIMITATION

No person may occupy public lands for more than 14 days within a consecutive 28-day interval. Beyond the 14-day period, occupation of another site shall not be within a 30 mile air radius of the heretofore occupied location. When the 14 days have been reached, site occupation shall not reoccur until at least 14 days have expired from the last day of use.

Unattended personal property shall not be kept on public lands for a period of more than 48 hours, with the exception that vehicles may be parked in designated parking areas for up to 14 consecutive days.

L.5 FIRES

In addition to the campfire restrictions above, fires are also prohibited in the following areas: Mill Creek Canyon Management Area and Negro Bill Canyon.

L.6 FIREWOOD CUTTING AND GATHERING

Where indicated (Canyon Rims, Sand Flats, Green River "Daily" corridor, Colorado Riverway, Highway 313 corridor including Canyonlands National Park entrance road, Gemini Bridges Road corridor, Long Canyon road corridor, Black Ridge road corridor, Blue Hill road corridor, Ken's Lake, Mill Creek Canyon Management Area, Behind the Rocks, and Negro Bill) firewood cutting and gathering, Christmas tree cutting and firewood permits are prohibited, except for traditional and historic uses by Native Americans, BLM official uses, or military, fire, emergency or law enforcement actions.

If conditions warrant, areas of restricted firewood cutting and gathering may be enlarged.

L.7 FIREARMS DISCHARGE

The discharge of firearms for all purposes is prohibited at improved recreation sites. Discharge of firearms for non-hunting purposes is prohibited in the Colorado Riverway SRMA, along the Green River "Daily" section, in the Mill Creek Planning Area, and in the Sand Flats Recreation Management Area. As numbers of visitors increase to any area, discharge of firearms restrictions may be extended to these areas to protect human life and safety.

L.8 Spark Arrestors

Spark arrestors are required on all public lands in the Moab Field Office as per CFR 8343.1(c).

L.9 Possession of Alcohol by Minors

Persons under 21 years of age are prohibited from possessing alcoholic beverages consistent with State law.

L.10 River Use

L.10.1 Boating Permits

Noncommercial float trip permits are required for the Colorado River in Westwater Canyon, on the Dolores River from the Utah line to the Colorado River confluence, and on the Green River within Labyrinth Canyon. These permits require the possession of first aid kits, air pumps, repair kits, portable toilet systems, and fire-pans. In addition, boaters may not gather firewood (except driftwood), must dispose of trash properly, must use biodegradable soap, may not bathe with any soap in tributary streams, and may not remove, damage or destroy any archaeological, historical or ecological resource.

L.10.2 Motorized Boat Travel

No boats may be launched for upstream motorized travel at the Westwater Ranger Station from February 1 through October 15 for protection of bald eagle nests.

No boats may be launched for upstream or downstream motorized travel at Cisco Landing from February 1 through October 15 for protection of bald eagle nests.

L.11 Additional Special Rules

No casting of dinosaur tracks without a permit issued through the BLM Utah State Office.

No glass containers at the Moab Canyon Sand Hill and at the Powerhouse Lane Trailhead and lower Mill Creek for a distance of 1 mile from the trailhead.

No burning of wood pallets on public lands within the Moab Field Office.

No camping with vehicles within 200 feet of isolated springs and potholes to allow space for wildlife access to water.

No commercial or private equestrian use in Negro Bill Canyon. Commercial equestrian use in Mill Creek Canyon would only be allowed on the Steelbender Road.

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APPENDIX M.

SPECIAL RECREATION MANAGEMENT AREAS: GOALS, SETTINGS, OUTCOMES, AND MANAGEMENT PRESCRIPTIONS

M.1 DEFINITIONS

These definitions are used throughout this Appendix:

Physical – Land & Facilities: The Character of the Natural Landscape

Primitive	Back Country	Middle Country	Front Country	Rural
Undisturbed natural landscape	Naturally appearing landscape having modifications not readily noticeable; primitive roads made of native materials	Naturally appearing landscape except for obvious primitive roads; maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features; improved yet modest; rustic facilities such as campsites, restrooms, trails, and interpretive signs	Natural landscape substantially modified by agriculture or industrial development; modern facilities such as campgrounds and boat launches

Social – Visitor Use & Users: The Character of Recreation and Tourism Use

Primitive	Back Country	Middle Country	Front Country	Rural
Fewer than 3 encounters/day on travel routes; only footprints observed; no noise or litter	3-6 encounters per day; footprints and bicycle tracks observed; noise and litter infrequent; slight soil and vegetation disturbance at campsites and popular areas	7-14 encounters/day on travel routes; vehicle tracks observed; occasional noise and litter; vegetation and soils becoming worn at campsites and high-use areas	15-29 encounters/day on travel routes; vehicle tracks common; some noise and litter; vegetation and soils commonly worn at campsites, along travel routes, and at popular areas	People seem to be generally everywhere; frequent noise and litter; large but localized areas with vegetation damage and soil compaction

Administrative – Administration & Services

Primitive	Back Country	Middle Country	Front Country	Rural
No mechanized use; no visitor services available; no visitor controls apparent; no use limits; enforcement presence very rare	Mountain bikes; and mechanized use; basic maps, but area personnel seldom available to provide on-site assistance; signs at key access points on basic user ethics; may have back country use restrictions; enforcement presence rare	OHVs/mechanized use; area brochures and maps, area personnel occasionally present to provide on-site assistance; occasional regulatory signing; motorized and mechanized use restrictions; random enforcement presence	Two-wheeled drive vehicles predominant, but also OHV and mechanized use; information materials describe recreation areas and activities; area personnel are periodically available; rules clearly posted; periodic enforcement presence	Highway auto and truck traffic is characteristic; informational materials describe recreation areas and activities plus experience and benefit descriptions; area personnel do on-site education; regulations prominent; enforcement presence

M.2 SPECIAL RECREATION MANAGEMENT AREAS

Cameo Cliffs Special Recreation Management Area (Destination SRMA), 15,597 acres

Description		
Cameo Cliffs is located east of U.S. Highway 191 and south of Moab near Hook and Ladder Gulch. The SRMA has an OHV trailhead, an information kiosk; the SRMA is riddled with a series of old mining exploration roads. These roads are lightly marked for OHV travel. Recreation use of this area is very light, with ATV'ing, hiking and horseback riding occurring.		
Management Goals		
For a variety of visitor benefits, provide opportunities for ATV'ing and other motorized travel on old mining exploration roads; provide opportunities for equestrian use on the Old Spanish Trail and in other non-roaded locations; provide opportunities for hiking in Hook and Ladder Gulch.		
Setting		
Maintain the scenic qualities of the area to allow visitors to enjoy an uncrowded experience. Provide information and a management presence sufficient to ensure that travel occurs only on the designated route system. Physical: Middle Country: Social: Middle Country; Administrative: Middle Country.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
ATV Riding	Enjoying having easy access to natural landscapes	Positive contributions to local economic stability
Horseback Riding	Adventure and exploration on a National Historic trail	Increased sense of adventure and appreciation for history Increased local tourism revenue
Hiking	Enjoying an escape from crowds of people	Greater sense of adventure Increased local tourism revenue
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads (see Map 2 for Designated Routes) Visual Resource Management: VRM II, III, IV; (see Map 31) Oil and Gas Leasing: Primarily Open to Leasing with Special Stipulations (see Map 12)		

Canyon Rims Special Recreation Management Area (Destination SRMA), 101,531 acres

Description		
Canyon Rims is located west of U.S. Highway 191 and south of Moab on a large plateau overlooking the Colorado River. The SRMA has three developed overlooks of the Colorado River, a scenic byway, two developed campgrounds, and a network of backcountry roads. Use includes scenic driving to the overlooks, camping, hiking and backcountry driving. Use levels are currently moderate.		
Management Goals		
For a variety of visitor benefits, 1) Provide scenic driving opportunities on the Scenic Byway and on the backcountry road system; 2) provide facilities at the scenic overlooks to enhance visitor experience; 3) provide quality camping experiences in two developed campgrounds; 4) provide hiking and backpacking opportunities, especially in Hatch Wash. For specific recreation management prescriptions, see Recreation Decisions in ROD.		
Setting		
Maintain the scenic character and open spaces of Canyon Rims to allow visitors to enjoy an uncrowded experience. Provide information and a management presence sufficient to protect these scenic values. Physical: Middle Country; Social: Middle Country; Administrative: Front Country.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
Visiting overlooks and scenic driving	Enjoying having easy access to natural landscapes	Increased local tourism revenue Improved appreciation of nature's splendor
Hiking and backpacking	Enjoying escape from crowds of people	Improved capacity for outdoor physical activity Increased local tourism revenue
Camping at developed campgrounds	Savoring the sensory experience of the natural landscape	Greater family bonding Increased local tourism revenue
Management Prescriptions from Other Programs		

Travel Management: Limited to Designated Roads (See Map 2 for Designated Routes) Visual Resource Management (VRM): VRM II and III; (see Map 31 for VRM Classes) Oil and Gas Leasing: Open to Leasing with Special Stipulations; (See Map 12 for Oil and Gas Leasing)

Colorado Riverway Special Recreation Management Area (Destination SRMA), 89,935 acres

Description		
The Colorado Riverway consists of the lands accessed by Utah Highways 128 and 279 and Kane Creek, Entrada Bluffs, Onion Creek, Castle Valley and Potash Roads. The SRMA has 19 developed campgrounds, 6 boat ramps, and 7 developed hiking trails. The Riverway has a very high level of use, with at least 600,000 visitors per year. Recreation use includes driving for pleasure, camping, hiking, boating, BASE jumping, climbing and equestrian use.		
Management Goals		
For a variety of visitor benefits, 1) provide scenic driving opportunities on the scenic byways, as well as on the non-paved roads; 2) provide quality camping experiences in the developed campgrounds; 3) provide non-motorized opportunities, including hiking, boating, climbing, equestrian use and BASE jumping. For specific recreation management prescriptions, see Recreation Decisions in ROD.		
Setting		
Maintain the scenic character and important vistas of the Colorado Riverway to allow visitors to enjoy the unsurpassed visual resources. Provide information and a regular and continuous management presence to allow the large numbers of visitors to enjoy the area while protecting its natural resources. Physical: Middle Country; Social: Middle Country; Administrative: Front Country.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
Scenic driving	Enjoying having easy access to natural landscapes	Increased tourism revenue Improved appreciation of nature's splendor
Camping at developed campgrounds	Savoring the sensory experience of the natural landscape	Greater family bonding Increased local tourism revenue
Boating	Enjoying unique outdoor opportunities	Greater sense of adventure Improved local economy
Hiking/equestrian	Enjoying physical activity in a scenic setting	Enhanced awareness and understanding of nature
Climbing/BASE jumping	Enjoying risk taking and adventures	Improved skills for outdoor adventure
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads (Map 2) Visual Resource Management (VRM): VRM I and II; (see Map 31 for VRM Classes) Oil and Gas Leasing: No Surface Occupancy/Closed along the rivers and in the Richardson Amphitheater. Remainder of SRMA is Open to Leasing with Special Stipulations. (See Map 12)		

Dolores River Canyons Special Recreation Management Area (Destination SRMA), 31,661 acres

Description		
The Dolores River Canyons SRMA is located about 25 miles east and south of Moab. The area has a limited number of roads, making motorized access difficult. Recreation use of this area is very light, with rafting and hiking being the most common activities. The only current infrastructure consists of directional signs.		
Management Goals		
For a variety of visitor benefits, provide opportunities for non-motorized boating, hiking and backpacking in the mostly undeveloped areas of the SRMA. For specific recreation management prescriptions, see Recreation Decisions in ROD.		
Setting		
Maintain the backcountry character and primarily undisturbed natural landscape to allow visitors to enjoy opportunities for solitude. Provide a very low level of facilities and management presence. Physical: Back country; Social: Primitive; Administrative: Primitive.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**

Non-motorized boating	Enjoying/going exploring on my/our own; enjoying an escape from crowds of people	Greater sense of adventure
Hiking and backpacking	Savoring the total sensory experience of a natural landscape	Improved outdoor knowledge and self-confidence; closer relationship with the natural world
Management Prescriptions from Other Programs		
Visual Resource Management: Primarily VRM II (See Map 31) Travel Management: Limited to Designated Roads (See Map 2 for map of designated roads) Oil and Gas Leasing: Primarily Open to Leasing with No Surface Occupancy (See Map 12)		

Extensive Recreation Management, 1,162,732 acres

Description		
The Moab Extensive Recreation Management Area (ERMA) consists of the acreage of the Moab Field Office that is **not** managed as a Special Recreation Management Area. The Bookcliffs, Lisbon Valley, Black Ridge, Yellow Cat, the Dolores Triangle and the Cisco Desert are in the ERMA.		
Management Goals		
ERMAs are utilized for recreation management only where recreation use is very low. While BLM may manage the ERMA for low visitation, visitation numbers are often established regardless of BLM actions. That is, visitors may "discover" a portion of public lands, and recreation numbers may increase with no input from the BLM. This increase in visitation may be fueled by magazine articles, tourism promotion or simple word of mouth. However, ERMAs are to be managed for very low visitation, and to this end, the goal of the ERMA is to provide custodial management only for recreation use. The ERMA will allow recreation activities while protecting other resources. Facilities are to be provided only for public safety.		
Setting		
Maintain the public lands for other uses while allowing recreation to continue. Provide no information and minimal management presence.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
Backcountry driving	Adventure and exploration	Improved skills for outdoor enjoyment
Primitive hiking, backpacking and equestrian use	Backcountry exploration	Improved opportunity to get away from the everyday world
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads (See Maps 2 and 3 for Designated Routes) Visual Resource Management (VRM): All 4 VRM Classes are managed for in the ERMA (see Map 31 for VRM Classes) Oil and Gas Leasing: A combination of open with standard stipulations, open with special stipulations, open with no surface occupancy and closed; (See Map 12 for Oil and Gas Leasing)		

Labyrinth Special Recreation Management Area (Destination SRMA), 300,650 acres

Description
Labyrinth SRMA includes the area between Labyrinth Canyon of the Green River, Highway 191, and the southwestern boundary of the field office. Scenic Byway 313 is within the SRMA. The SRMA has one developed campground and multiple designated campsites, multiple day use areas and numerous popular backcountry routes. Use includes river recreation, camping, hiking, scenic driving, mountain biking and backcountry driving. Use levels are moderate overall with some areas receiving heavy seasonal use.
Management Goals
For a variety of visitor benefits, provide opportunities for 1) quality river recreation experiences on Labyrinth Canyon; 2) quality camping experiences in one developed campground and other designated sites; 3) quality hiking experiences on- and off-trail; 4) quality scenic driving experiences on Highway 313; 5) quality on-route mountain biking and backcountry driving experiences on established routes throughout the SRMA. For specific recreation management prescriptions, see Recreation Decisions in ROD.
Setting
Maintain the scenic character of Labyrinth SRMA to allow visitors to enjoy an unconfined experience. Provide information and a management presence sufficient to protect these scenic values. Physical: Middle – Front Country; Social: Middle – Front Country; Administrative: Front Country.

Targeted Outcomes		
Activity	**Experience**	**Benefit**
River recreation	Enjoying an escape from crowds of people	A more outdoor-oriented lifestyle
Scenic Driving	Learning more about things here	Greater sense of adventure
Mountain Biking	Enjoying/going exploring on my/our own	Restored mind from unwanted stress
Backcountry Driving	Developing your skills and abilities	Improved skills for outdoor enjoyment
BASE jumping	Enjoying outdoor challenge	Improved skills
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads (See Maps 2 and 3 for Designated Routes), Visual Resource Management (VRM): VRM II, III, IV (See Map 31 for VRM Classes) Oil and Gas Leasing: Open with Standard Stipulations, No Surface Occupancy. (See Map 12 for Oil and Gas Leasing)		

Lower Gray Canyon Special Recreation Management Area (Destination SRMA), 3,760 acres

Description
Lower Gray Canyon SRMA is located along the east side of the Green River near the City of Green River. The SRMA has one developed campground, two day use areas, and hiking/equestrian trails. Use includes whitewater boating, camping, hiking and horseback riding. Use levels are currently moderate.
Management Goals
For a variety of visitor benefits, provide opportunities for 1) scenic river recreation opportunities on the Green River Daily; 2) quality camping experiences in one developed campground and other designated sites; 3) quality hiking and horseback riding experiences on existing trails. For specific recreation management prescriptions, see Recreation Decisions in ROD.
Setting
Maintain the scenic character of Lower Gray Canyon to allow visitors to enjoy an unconfined experience. Provide information and a management presence sufficient to protect these scenic values. Physical: Middle Country; Social: Middle Country; Administrative: Front Country.

Targeted Outcomes		
Activity	**Experience**	**Benefit**
Whitewater boating	Enjoying having easy access to natural landscapes	Improved outdoor recreation skills and increased local tourism revenue
Camping	Enjoying the closeness of family	Stronger ties with my family and friends
Hiking	Enjoying an escape from crowds of people	Restored mind from unwanted stress
Horseback riding	Learning more about things here	Improved appreciation of nature's splendor
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads (See Map 2 for Designated Routes) Visual Resource Management (VRM): VRM I and II. (See Map 31 for VRM Classes) Oil and Gas Leasing: No Surface Occupancy and Closed (predominantly Closed). (See Map 12 for Oil and Gas Leasing)		

Sand Flats Special Recreation Management Area (Destination SRMA), 6,246 acres

Description
Sand Flats SRMA is located two miles east of the city of Moab. The area has 9 campgrounds with 120 sites, the Slickrock Bike Trail, the Porcupine Rim Trail and two well known jeep routes, Hell's Revenge and Fins and Things. Recreation use averages 100,000 visitors per year. Use includes camping, mountain biking, four wheel driving (including ATV's and dirt bikes), and hiking.
Management Goals

For a variety of visitor benefits, 1) provide facilities for quality camping experiences; 2) provide the unique experience of biking the Slickrock Trail; 3) provide four wheel drive challenge routes; 4) provide opportunities for hiking. Continue the partnership between Grand County and the BLM. For specific recreation management prescriptions, see Recreation Decisions in ROD.
Setting
Maintain the scenic character of Sand Flats to allow visitors to enjoy an outdoor adventure experience. Provide information and a high degree of management presence to protect the scenic values and to allow for a large number of visitors. Physical: Front Country; Social: Front Country; Administrative: Front Country.
Targeted Outcomes

Activity	Experience	Benefit
Mountain Biking	Enjoying a physical challenge	Improved skills for outdoor enjoyment and physical activity Increased local tourism revenue
Motorized touring	Enjoying the great outdoors and testing one's skills	Greater sense of adventure Increased local tourism revenue
Hiking	Enjoying an escape from crowds of people	Restored mind from unwanted stress
Camping in Developed Sites	Enjoying time with family and friends in an outdoor setting	Enjoying time with family and friends in an outdoor setting

Management Prescriptions from Other Programs
Travel Management : Limited to Designated Roads (See Map 2 for Designated Routes) Visual Resource Management (VRM): VRM II (see Map 31 for VRM Classes) Oil and Gas Leasing: No Surface Occupancy (See Map 12 for Oil and Gas Leasing)

South Moab Special Recreation Management Area (Destination SRMA), 63,999 acres

Description
The South Moab Special Recreation Management Area is located south of Moab, with US 191 being an approximate bisection. It includes popular day use areas such as Ken's Lake, as well as portions of the Mill Creek Canyon WSA. Most of the area is easily accessible from Moab, and receives moderate to heavy recreation use, both motorized and non-motorized. Infrastructure ranges from developed campgrounds to directional signing only.
Management Goals
For a variety of visitor benefits, provide opportunities for hiking, camping, motorized and mechanized touring. For specific recreation management prescriptions, see Recreation Decisions in ROD.
Setting
Maintain the mainly front country character to allow visitors to enjoy hiking, camping and scenic touring activities. Physical: Front country; Social: Front country: Administrative: Front country.
Targeted Outcomes

Activity	Experience	Benefit
Hiking	Enjoying having easy access to natural landscapes; enjoying getting some needed physical exercise	A more outdoor-oriented lifestyle
Camping	Experiencing a greater sense of independence; enjoying the closeness of family	Improved outdoor knowledge and self-confidence
Motorized touring	Developing your skills and abilities; enjoying having easy access to natural landscapes	Enlarged sense of community dependency on public lands
Mechanized touring	Enjoying strenuous physical exercise; experiencing a greater sense of independence	Improved physical capacity to do my favorite recreation activities

Management Prescriptions from Other Programs
Visual Resource Management: A combination of VRM I, II and III (See Map 31) Travel Management: Limited to Designated Roads (See Map 2 for map of designated roads) Oil and Gas Leasing: A combination of Open, Open with Special Stipulations, Open with No Surface Occupancy Stipulation and Closed (WSA's) (See Map 12)

Two Rivers Special Recreation Management Area (Destination SRMA), 29,838 acres

Description		
Two Rivers SRMA is located along the Colorado River (from the Colorado/Utah state line to Dewey Bridge) and the Dolores River. The SRMA contains river sections very popular for scenic floating and/or whitewater boating, including the lower portion of the Ruby/Horsethief Canyon trip and Westwater Canyon. Use includes river running, camping, and hiking. Use levels are moderate to high.		
Management Goals		
For a variety of visitor benefits, provide opportunities for 1) high quality river running opportunities on the Colorado and Dolores Rivers; 2) high quality camping experiences along the river corridors; 3) high quality hiking opportunities in proximity to the river. For specific recreation management prescriptions, see Recreation Decisions in ROD.		
Setting		
Maintain the scenic character of Two Rivers SRMA to allow visitors to enjoy a backcountry experience. Provide information and a management presence sufficient to protect this type of experience. Physical: Back Country; Social: Back Country – Middle Country; Administrative: Middle Country.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
River Recreation	Savoring the total sensory experience of a natural landscape	Closer relationship with the natural world
Camping	Escaping everyday responsibilities for a while	A more outdoor-oriented lifestyle
Hiking	Enjoying an escape from crowds of people	Restored mind from unwanted stress
Management Prescriptions from Other Programs		
Travel Management: Limited to Designated Roads and Closed (See Map 2 for Designated Routes) Visual Resource Management (VRM): VRM I and II. (See Map 31 for VRM Classes) Oil and Gas Leasing:: Open to Leasing with Special Stipulations, No Surface Occupancy and Closed. (See Map 12 for Oil and Gas Leasing).		

Utah Rims Special Recreation Management Area (Community SRMA), 15,424 acres

Description		
Utah Rims is located south of Interstate 70 adjacent to the Colorado/Utah border and near the Colorado River. The SRMA has one developed camping area, and a network of backcountry routes. Use includes trail-based motorcycle and mountain bike riding, camping and horseback riding. Use levels are currently low.		
Management Goals		
For a variety of visitor benefits, provide opportunities for 1) quality scenic trail-based motorcycling and mountain biking experiences on the backcountry route system; 2) quality camping experiences in one developed camping area; 3) quality horseback riding experiences on existing routes and in non-roaded locations. For specific recreation management prescriptions, see Recreation Decisions in ROD.		
Setting		
Maintain the scenic character and wide open spaces of Utah Rims to allow visitors to enjoy an uncrowded experience. Provide information and a management presence sufficient to protect these scenic values. Physical: Middle Country; Social: Middle Country; Administrative: Middle Country.		
Targeted Outcomes		
Activity	**Experience**	**Benefit**
Motorcycling	Enjoying being able to frequently participate in desired activities and settings	Increased desirability as a place to live or retire
Mountain biking	Enjoying strenuous physical exercise	Improved skills for outdoor enjoyment
Horseback riding	Developing your skills and abilities	Greater sense of adventure
Camping	Enjoying an escape from crowds of people	Restored mind from unwanted stress
Management Prescriptions from Other Programs		

Travel Management: Limited to Designated Roads (See Maps 2 and 3 for Designated Routes) Visual Resource Management (VRM): VRM II and III (predominantly VRM III). (See Map 31 for VRM Classes) Oil and Gas Leasing: Open to Leasing with Standard Stipulations and Open to Leasing with Special Stipulations. (See Map 12 for Oil and Gas Leasing)

APPENDIX N
TRAVEL PLAN DEVELOPMENT

N.1
INTRODUCTION

Travel management is the process of planning for and managing access and travel systems on the public lands. Comprehensive travel management planning should address all resource use aspects, such as recreational, traditional, casual, agricultural, commercial, and educational, and accompanying modes and conditions of travel on public lands, not just motorized or off-highway vehicle activities (BLM Land-use Planning Handbook 1601-1). This includes travel needs for all resource management programs administered by the BLM, including but not limited to the mineral industry, livestock grazing, and recreation.

Though historically focused on motor vehicle use, comprehensive travel management also encompasses all forms of transportation including travel by mechanized vehicles such as bicycles, as well as the numerous forms of motorized vehicles from two-wheeled (motorcycles) and four-wheeled such as all-terrain vehicles (ATVs) to cars and trucks.

The term off-road vehicle (ORV) is an outdated term that has the same meaning as off-highway vehicle (OHV), which is currently in use. The term off-highway vehicle (OHV) refers to the latter group noted above – "any motorized vehicle capable of, or designated for, travel on or immediately over land, water, or other natural terrain," as defined in the National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, finalized by the Bureau of Land Management (BLM) in January 2001. The intent of the National Strategy was to update and revitalize management of off-highway motor vehicle use on BLM administered lands. The national strategy provides guidance and recommendations to accomplish that purpose.

The process of development and content of the draft Moab travel plan are described in this document.

N.2
HOW TO READ/USE THIS DOCUMENT

This document addresses the process by which the BLM Moab Field Office Interdisciplinary (ID) Team and its cooperating agencies have developed the Draft Environmental Impact Statement (DEIS)/Resource Management Plan (RMP) alternatives for motorized and mechanized use in the Moab Field Office. This document takes the reader through the process of travel planning within the Moab Field Office and addresses the following issues and concerns.

- The Land-use Planning decisions of the travel plan define the areas within the field office that are determined to be Open, Limited, or Closed, and the number of miles of designated routes under the Limited category.
- The Implementation decisions of the travel plan include the designation of routes within areas delineated as Limited to Designated Roads and Trails. Other implementation actions include signage, maps, public information, kiosks, monitoring, and working with partners.

Enforcement of OHV designations should be clear once routes are signed. An implementation plan will be prepared at a later time with details regarding these actions.

- Issues identified during public scoping for this travel plan process are described in Section 6.
- The planning criteria, data collection, and alternatives development by which the BLM and its cooperating agencies arrived at the routes designated for the alternatives in the DEIS/RMP are outlined in Sections 7, 8 and 9. Lists of routes for non-motorized, equestrian/stock, and foot travel are also provided in Section 9.
- Future changes to route designations are addressed in Section 10.
- The cooperating agencies involved with developing the travel plan are identified in Section 11. Other coordination is also included.
- The analysis of impacts for the travel plan will be completed within the DEIS/RMP.
- Definitions commonly used in addressing off-road vehicle use are found in an Attachment A. Route by route information can be found in the GIS records accompanying the Approved RMP (available upon request) Map 2 displays the designated routes in the Approved RMP.

N.3
SUMMARY

Land-use Planning Decisions – The Federal Regulations at 43 CFR Part 8340 and Executive Order 12608 require BLM to designate all public lands as Open, Limited, or Closed for OHV use. These designations are made in the Resource Management Plans (RMPs) or in plan amendments. Additionally, the criteria for route designation are established in the RMP.

Table N.1 lists the lands within the Open, Limited, and Closed OHV categories within the Moab Field Office as determined by the ID Team.

Table N.1. OHV Categories (acreage)

Category	Approved RMP
Closed	349,298
Limited to Existing	0
Limited to Designated	1,481,334
Open	1,866
Totals[1]	1,821,374
[1]Excludes lands in the Moab Field Office managed by the BLM Vernal Field Office.	

Implementation Decisions – The designation of routes within the areas specified as "Limited to Designated" is an implementation decision. Designation involves the selection and identification of roads and trails to be included in a travel plan system.

Table N.2 and Table N.3 provide a summary of the miles of designated routes (full sized) for Grand County and San Juan County, respectively.

Table N.2. Designated Routes (miles) for Grand County

Road Type	Grand Co Inventory (All lands)	Grand Co Inventory (BLM lands)	Grand Co Proposed Travel Plan[1]	Grand Co Proposed Travel Plan (BLM lands)	Approved RMP
"A" roads	280	184	280	184	184
"B" roads	1441	995	1441	995	995
"D" roads/other[2]	5544	4171	2940	1898	1703
Total miles	7265	5350	4661	3077	2882

[1] Includes routes recommended by Grand County for designation as motorized as well as a number of "undetermined" routes. Some of these are outside of the County 's jurisdiction (e.g. tribal, USFS), or left to the BLM 's discretion.
[2] "Other" consists primarily of old railroad grades and mapped pack trails totaling 86.4 miles.

Table N.3. Designated Routes (miles) for San Juan County

Road Type	San Juan Co Travel Plan	San Juan Co Travel Plan/BLM	Approved RMP
"A" roads	51	20	20
"B" roads	343	171	171
"D" roads	1246	862	824
Total miles	1640	1053	1015

Table N.4 summarizes the miles of designated routes (motorcycle) on BLM lands which are entirely within Grand County. This Table also includes Grand County roads which are part of the motorcycle trail system.

Table N.4. Designated Motorcycle Routes (miles)

Route	Inventory	Approved RMP
On existing Grand Co roads	142	163
Single-track	129	150
Total	271	313

Management decisions include the following, as developed by the ID Team in preliminary alternative development meetings:

- In areas limited to designated routes, only designated routes are open to motorized use.
- Off-highway vehicle use includes *motorized* (e.g., autos, trucks, ATVs, motorcycles, dirt bikes, 4x4s); and *mechanized* (e.g., bicycles).
- There will be no cross-country travel for game retrieval or antler gathering in areas designated as limited or closed. This policy is consistent with the policies of the National Forest Service in Utah.
- No cross-country travel associated with dispersed camping is allowed.
- Any fire, military, emergency or law enforcement vehicle when used for emergency purposes is exempted from OHV decisions.
- Wilderness Study Areas are designated as limited or closed to OHV use, and will be managed and monitored to comply with the interim management policy non-impairment standard.
- As required in 43 CFR Sec. 8342.3 (Designation changes): "The authorized officer shall monitor effects of the use of off-road vehicles. On the basis of information so obtained, and

whenever the authorized officer deems it necessary to carry out the objectives of this part, designations may be amended, revised, revoked, or other actions taken pursuant to the regulations in this part."

N.4
AUTHORITY AND GUIDANCE

- Federal Land Policy and Management Act (FLPMA), 43 U.S.C 1701 – Land-use plans and revision should be based on principles of multiple use and sustained yield.
- National Environmental Policy Act, (NEPA), 42 U.S.C. 4321.
- Executive Order No. 11644, Feb 8, 1972 - This order established criteria by which federal agencies were to develop regulations for the management of OHVs on lands under their management. Agencies are to "monitor the effects" of OHV use on their public lands and, "on the basis of the information gathered, they shall from time to time amend or rescind designation of areas for OHV use "as necessary to further" its policy.
- Executive Order No**.** 11989, May 25, 1977 – This order modified ED 11644 – This order authorized agencies to adopt a policy that particular lands can be considered closed to OHVs once it is determined that OHV use "will cause or is causing considerable adverse effects" to particular resources.
- Executive Order No. 12898, 1994 – Indicates that Federal planning efforts should give consideration to how plans will affect local economies.
- 43 C.F.R. Part 8340 – the OHV Regulations – Establish criteria for designating lands as open, limited, or closed to the use of OHVs.
- Archeological Resources Protection Act (ARPA), 1979, as amended. And other Cultural protection laws and regulations.
- Taylor Grazing Act, 43 U.S.C. 315a.
- Endangered Species Act, 16 U.S.C. 1531 – Federal agencies shall give consideration to ensure agency actions do not jeopardize the continued existence of any endangered species.
- Land and Water Conservation Fund Act, 16 U.S.C. 460 1-6a.
- National Historic Preservation Act, as amended, 1966.
- Wild and Scenic Rivers Act, 16 U.S.C. 1281c.
- National Trails System Act, 16 U.S.C. 1241.
- U.S. Department of the Interior, BLM, Interim Management Policy for Lands Under Wilderness Review, H-8559-1.
- Resource Management Plan, BLM San Juan Resource Area, March 1991.
- IB 99-181, OHV Use in Wilderness Study Areas (WSAs).
- IM UT 2001-090, Implementation of Utah Recreation Guidelines.
- IM [WO] No. 2004 – Clarification of Cultural Resource Considerations for Off-Highway (OHV) Route Designation and Travel Management.
- IM 2004-005, Clarification of OHV Designations and Travel Management in the BLM Land-use Planning Process.
- IM UT 2004-008, Clarification of OHV Designations and Travel Management in the BLM Land-use Planning Process.

- IM UT 2004-061, Designating Off Highway Vehicle Routes in the Land-use Planning Process.
- OHV – National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, USDI, BLM, January 2001.
- Standards for Public Land Health and Guidelines for Recreation Management for BLM Lands in Utah, 2001.

N.5
TRAVEL PLAN DESIGNATION PROCESS

A goal of the BLM Moab Field Office planning process is to develop, with its cooperators, a travel plan that provides access to public lands. The goals and objectives of this travel plan apply to all areas of travel management including access to resources, appropriate recreation opportunities that at the same time protect public land resources, ensuring public safety, minimizing conflicts among the various public land-uses, and providing for support of the local economy.

N.5.1
BACKGROUND

Areas designated as "open" are open to cross-country motorized travel. Areas designated as "closed" are entirely closed to motorized travel. Areas designated as "limited" restrict motorized travel to either existing or designated routes.

The 1985 Grand Resource Area RMP included designations for Open, Closed, and Limited OHV areas with limited applying to both existing and designated roads and trails. Since 1992, the Moab Field Office has instituted several revisions to the original RMP (through plan amendments) as well as Federal Register notices regarding OHV use. These changes have resulted in changes from Open to Limited to Existing Roads and Trails, and in some cases from Open to Limited to Designated Routes. These changes attempted to reduce damage resulting from unrestricted cross-country travel.

In the current RMP process, state and national guidance for the OHV Limited category designation has changed. Designating Open, Closed, and Limited areas for OHV use continues to be mandated, but under the Limited category only the "Limited to Designated Roads and Trails" sub-category is recommended. The designation of the sub-category "Existing Roads and Trails" is no longer a recommended option. Eliminating the "Existing Roads and Trails" sub-category prevents confusion and enforcement problems concerning new unauthorized routes being created and then used by the public because they are then "existing". By policy (IM No. 2004-005) BLM discourages of the use of the "Limited to Existing" category.

N.5.2
INTERDISCIPLINARY (ID) TEAM PROCESS

Guidance for developing a Travel Plan includes utilizing the ID Team approach (8342.21A and 43 CFR 1601.1-3). The individuals who participated in the completion of the plan are listed in Table N.5.

Table N.5. Moab FO Interdisciplinary (ID) Team Members and Cooperators

Name	Resource /Organization
Maggie Wyatt	Field Office Manager
Eric Jones	Acting Associate Field Office Manager, Petroleum Engineer
Lynn Jackson	Acting Associate Field Office Manager, RA/Science and Outreach
Brent Northrup	RMP Planning Coordinator, RA/Lands and Minerals
Russ von Koch	Branch Chief, Recreation
Bill Stevens	Travel Plan Lead, Recreation Planner
Doug Wight	GIS Coordinator
Jean Carson	GIS Specialist
Rob Sweeten	Landscape Architect/VRM
Ann Marie Aubry	Hydrologist
Stephanie Ellingham	Natural Resources Specialist
Donna Jordan	Resource Clerk
Pam Riddle	Wildlife Biologist
Daryl Trotter	Environmental Protection Specialist/NEPA Coordinator
Donna Turnipseed	Cultural, Paleontology
Mary von Koch	Realty Specialist
Chad Niehaus	Recreation Planner
Katie Stevens	Recreation Planner
Jon Sering	BLM Law Enforcement Ranger
James Ward	BLM Law Enforcement Ranger
Alex VanHemert	Recreation Planner
Jerry McNeely	Chair, Grand County Council
Dave Vaughn	Grand County Assistant Road Supervisor/GIS Specialist
Evan Lowry	San Juan County, Planner
Ben Nielson	San Juan County, Assistant Planner

Between October, 2004 and September, 2005, the ID Team held 21 meetings specifically concerning the travel plan [meeting minutes are in the RMP Administrative Record]. In addition, BLM staff met with representatives of the National Park Service, Utah State Parks, and Utah School and Institutional Trust Lands Administration, to determine what concerns they might have with the travel planning process. BLM staff also contacted adjacent BLM offices to ensure that Moab's travel planning did not conflict with theirs. BLM also used the Manti-LaSal National Forest route designation map to ensure proper route continuity. Finally, Moab BLM staff was in constant contact with the Monticello Field Office, to provide as much consistency as possible in travel planning. This was especially important for routes in San Juan County, as this county lies within both BLM offices.

N.6
IDENTIFICATION OF ISSUES

OHV/Travel issues were identified by BLM resource specialists in the pre-plan, through the Public Scoping process for the Monticello/Moab Field Offices RMP, by input from the public in response to Planning Bulletin #3 -- Request for Route Data, and through proposals for travel routes presented to BLM from organizations.

BLM staff identified the following issues concerning travel in the field office.

- Route designations in the current RMP are outdated and do not address the current level of use.
- OHV designations need to be reviewed and revised as necessary to protect other resources.
- Maps need to be developed to identify uses of competing resources, and to show the public where OHV use is allowed.
- Implementing designated routes on-the-ground through signing and maps.
- OHV designations must be consistent with Wilderness Study Areas (WSAs).
- Dependence of local industry on public lands (including the recreation industry).
- Increased recreation use and demand.
- Conflicts between OHV use and other resources including riparian, wildlife, sensitive soils, visual, vegetation, and cultural. Conflicts also exist between OHV use and resource uses such as grazing and oil and gas activities.
- Conflicts between user groups such as non-motorized and motorized users, between river runners and OHV users, between commercial and private users, and OHV use associated with unregulated camping.

Comments received from public scoping were placed in one of three categories:

- Issues to be addressed in the resource management plan (RMP). Specific to this travel plan, these are the OHV/Travel issues considered in the Moab Field Office;
- Issues that can be addressed through policy or administrative actions; or
- Issues beyond the scope of the plan (e.g., RS 2477 claims, new wilderness proposals).

Comments from the six public scoping meetings included 440 comments on recreation and OHV/Travel or 35% of the total 1,250 comments. Comments received in letters concerning the Moab Field Office OHV and Travel program totaled 4,134 or 39% of the total comments, with the remaining 61% of the comments addressing the 14 remaining resource or planning categories (Moab and Monticello RMP Revisions, Scoping Summary, July 2004). Of all the written comments received regarding the Moab RMP, 92.9% commented on OHV use to one degree or another.

Input from Public Scoping both through the public meetings (June 4, 2003 through December 31, 2004), and through input responses to Planning Bulletin # 3, identified the following issues, many of which are similar to those noted above:

- How can increased recreation use, especially motorized vehicle use, be managed while protecting natural resource values?

- Which areas should be designated as open, limited or closed to OHV use, and which routes should be designated within the limited category?
- What types of recreation travel should be available on designated routes and under what limitations?
- Where could adaptive management be applied in response to unacceptable resource impacts?
- How should recreational uses be managed to limit conflicts with other recreational users?
- How should camping, hunting access, human waste, fires, and wood collection be managed [in terms of OHVs]?
- How should conflicts with other resource uses be reduced?
- What management actions should be implemented to mitigate damage caused by recreational uses, including vehicles, on other resources and sensitive areas, especially riparian areas?
- How should recreation in the planning areas be managed to ensure public health and safety?

N.7
DEVELOPING PLANNING CRITERIA

Considerations of both social and physical elements help define the criteria for a travel plan. The social aspects include public demands, historical uses, existing rights-of-way, permitted uses, public access, resource development, law enforcement and safety, conflicts between existing or potential uses, recreation opportunities, local uses, cultural and economic issues. Physical aspects include the terrain, soils, water, vegetation, and watersheds, connectedness of routes, special designations such as WSAs, demands for specific types of vehicle use, and manageability considerations.

General planning criteria for the Resource Management Plan (RMP) process includes:

- Decisions - All decisions made in the RMP will only apply to public lands managed by the BLM.
- Existing Rights – The plan recognizes current, valid existing rights.

Specific to the travel plan, the criteria include:

- National OHV Policy - Decisions regarding OHV travel will be consistent with the BLM's National OHV Strategy.
- R.S. 2477 - No regulations to either assert or recognize R.S. 2477 rights-of-way currently exist. While R.S. 2477 claims have been asserted by Grand and San Juan Counties, it is beyond the scope of this document to recognize or reject R.S. 2477 assertions, and this issue is not addressed further in this Travel Plan. Nothing in this document is intended to provide evidence bearing on or addressing the validity of any R.S. 2477 assertions. At such time as a decision is made of R.S. 2477 assertions, BLM will adjust travel routes accordingly, where necessary.
- Access to Utah School and Institutional Trust Lands Administration (SITLA) State Sections - BLM is required to provide access to State lands, as requested.

N.7.1
OHV DESIGNATION CRITERIA

The guidance found at 8342.1 lists the following criteria that must be met by BLM in the travel planning process:

Protection Requirements – the following resource protection criteria must be met:

1. Cultural and Natural Resources – Designations must minimize damage to all cultural and natural resources. Examples of these include, but are not limited to, the following: historical and archeological sites, soil, water, air, vegetation, and scenic values.
2. Wildlife – Designations must minimize harassment of wildlife and/or significant disruption of wildlife habitat.
3. Endangered Species – Special attention must be given to protect endangered or threatened species and their habitat.
4. Wilderness – Designations must not impair the wilderness suitability of lands under consideration for inclusion in the wilderness system.

User Access Requirements – the following criteria are used to assure adequate consideration for the requirements for each resource activity (i.e., minerals, range, forestry, recreation, etc.) as they relate to access needs:

1. Operational needs – designations must consider user access requirements for inventory, exploration, use supervision, maintenance, development, and extraction of public land resources as well as maintenance of facilities on public lands.
2. State and Private Land – designations must consider the access and use needs for areas and routes located within intermingled State and private land.

Public Safety – The designation of areas and routes for OHV use must be completed so as to promote public safety, recognizing that challenge and risk are desirable factors for some uses.

1. Hazards – Designations must minimize or eliminate OHV use in areas of extreme natural or man-made hazards unless such hazards can be mitigated.
2. Safety Factors – Designations must separate uses in situations where public safety factors present unacceptable risks (e.g., rifle ranges, children's play areas, mines, etc.)

Conflict Resolution – The designation of areas and routes for OHV use must assure full consideration of the multiple-use values of public lands consistent with the following criteria:

1. Balanced Approach – Designations must provide as wide and as balanced an approach to public land access as possible to protect public land resource values while at the same time meeting user access needs.
2. Other Uses – Designations must minimize conflicts between OHV use and other existing or proposed uses of the public lands.
3. Compatibility – Designations must ensure the compatibility of OHV uses with existing conditions in populated and other sensitive areas by taking into account noise, air pollution, and other factors of the human environment.

N.7.2
MOAB FIELD OFFICE CRITERIA FOR TRAVEL PLAN

Criteria for travel planning include Standards for Rangeland Health; establishing purpose and need (P/N) for routes per above mentioned guidance; defining conflicts between resources; defining conflicts among users; evaluation and consideration of routes in terms of WSAs; administration and emergency uses, and access to private and SITLA lands.

Standards for Rangeland Health of BLM land in Utah relate to all uses of public land, including recreation, and describe natural resource conditions that are needed to sustain public land health. The Standards encompass upland soils; riparian systems; plant and animal communities; special, threatened, and endangered species; and water quality. The Rangeland Health Standards provide guidance for management of resources.

N.7.2.1
PURPOSE AND NEED

The methodology used during the route designation ID Team meetings to develop a well-designed travel network was a mix between guidance received from the State Office and guidance from the Washington Office:

- IM UT 2004-061, from the UTSO, states that Field Offices should begin the route designation process with existing inventory and data, and then determine purpose and need for the existing routes.
- IM 2004-005, from the WO, recommends choosing individual roads and trails for designation, "rather than using inherited roads and trails", because most existing roads "were created by use over time, rather than planned and constructed for specific activities and needs".

The purpose and need for travel routes are examined in terms of the existing situation on-the-ground in terms of why the route is currently utilized. The Moab Field Office considered the following criteria for routes in the travel plan:

- Desired future conditions
  - Potential for adverse or positive economic impacts
  - Resource and use conflicts
  - Standards for Public Land Health and Guidelines for Recreation
  - Management for BLM Lands in Utah
- Public health and safety
  - Abandoned Mine Lands
  - Hazardous Materials
- Access
  - Routes identified in guide books, including popular routes used in the Easter Jeep Safari event
  - Scenic overlooks
  - Access to private and SITLA lands
  - Elimination of route redundancy

  - Special Recreation Management Areas
  - Special designation prescriptions including Areas of Critical Environmental Concern (ACECs), Wilderness Study Areas (WSAs), and Wild and Scenic Rivers (WSRs)
- Cultural and paleontological resources
- Fire considerations
- Mineral resources/energy development
- Rangeland standards
- Recreation opportunities and experiences
- Watershed resources
  - Erosive soils
  - Saline soils
  - Municipal watersheds
- Vegetative resources including relict vegetation
- Wildlife resources
  - Special Status Species
  - Crucial winter habitats
  - Rutting, calving, kidding, lambing, and fawning habitat
  - Raptor nesting locations
- Woodlands resources
- Visual resources

N.7.2.2
MITIGATIONS

Mitigations that can be utilized to address conflicts could include:

1. Non-designation;
2. The season and timing of use;
3. The types of vehicle use, motorized and non-motorized;
4. Re-routing of segments; and
5. Other methods of travel.

N.7.2.3
ROUTE NUMBERS

Grand County has unique identifiers for each of the route segments in its inventory, with segments usually defined between intersections. San Juan County also has route numbers for each road in its inventory, although these numbers tend to correspond to an entire route, rather than a route segment. The Moab Field Office uses the same route numbers as the counties in the travel plan analysis.

In collaboration with the Manti-LaSal National Forest, which has its own numbering system, BLM and San Juan County have suggested that the BLM provide its joint numbering system with the county as an adjunct to that of the Forest for signing routes on-the-ground. It is possible that routes on the National Forest will bear two different numbered signs, one for the forest and

one denoting the route number of the county route on a separate post. These two systems will be incorporated into the implementation plan in mapping and written public information.

N.7.2.4
ROUTE DESIGNATIONS IN WILDERNESS STUDY AREAS (WSAS)

Information Bulletin No. 99-181 (BLM) directs BLM to comply with the wilderness 'non-impairment' mandate (FLPMA, Section 603(c)). BLM must monitor and regulate the activities of off-highway vehicles in the Wilderness Study Areas to assure that their use does not compromise these areas by impairing their suitability for designation as wilderness.

The BLM's Off Road Vehicle Regulations (43 CFR 8342.1) require that BLM establish off-road vehicle designations of areas and routes that meet the non-impairment mandate. It is the BLM's policy that cross-country vehicle use in the WSAs does cause the impairment of wilderness suitability. Thus, the BLM should establish off-road vehicle designations in WSAs that limit vehicular access to boundary roads, or "ways" existing inside a WSA that were identified during the inventory phase of the wilderness review.

N.7.2.5
ADMINISTRATIVE ACCESS AND USE

Routes considered for Administrative Use Only were discussed by the ID Team. These administrative categories could include routes to stock ponds and other range improvements, guzzlers, and BLM facilities. The Moab Field Office reserves the right to allow travel on these routes to permittees, BLM employees, or whomever it deems appropriate on a case-by-case basis.

N.7.2.6
EMERGENCY USES

By regulation, any fire, military, emergency or law enforcement vehicle when used for emergency purposes is exempted from OHV decisions. Emergency uses in WSAs are covered under the IMP, Section I.B.11 and 12.

N.7.2.7
EMERGENCY LIMITATION OR CLOSURE

Whenever the authorized officer determines that OHV use will cause or is causing considerable adverse effects on resources (i.e., soil, vegetation, wildlife, wildlife habitat, cultural, historic, scenic, recreation, or other resources), the area must be immediately closed to the type of use causing the adverse effects (43 CFR 8341.2). Such limitation or closures are not OHV designations.

N.8
MOAB FIELD OFFICE TRAVEL PLAN -DATA COLLECTION

N.8.1
INTRODUCTION

As part of the BLM's RMP process, a travel plan has been prepared for the Moab Field Office. This process includes preparing a range of alternatives for inclusion in the Draft Environmental Impact Statement (DEIS). The BLM will provide a range of alternatives as to which areas of the

Field Office will be *open* to OHV travel, which areas will be *closed* to OHV travel, and which areas will be *limited* to designated routes. Within the limited areas, BLM will provide a range of alternatives by varying miles of designated routes. An initial step was to verify the road maps submitted to the BLM by Grand and San Juan Counties (and also routes submitted by private parties, discussed later). The maps and associated GIS data encompass tens of thousands of road segments in an area covering more than 1.8 million acres. This makes an on the ground verification of each road segment impractical; fortunately, methods exist which can greatly reduce the road verification workload and still achieve satisfactory results.

For road verification in Grand County, BLM relied on statistical sampling and aerial photography wherever possible for road verification. The purpose of the study is not to draw conclusions as to the condition, extent of use or function of these road segments, but simply to verify that they exist. Details of the study are described below.

For road verification in San Juan County, BLM replicated the procedures described above for Grand County. In addition, an on the ground verification of all road segments within a limited area was also undertaken. This latter approach simply provided a different mechanism for accomplishing the same overall goal. Details of both approaches are described below.

N.8.2
GRAND COUNTY ROAD VERIFICATION

Verification of Grand County road data encompassed the following steps:

1. Grand County provided the BLM with GIS data (as of May 8, 2003) of all County-documented road segments within Grand County. The data includes not only roads on BLM, but also private roads, National Park Service Roads, and some road data in those parts of San Juan County in close proximity to Grand County. BLM used ArcView 3.3 GIS software to export to MS Excel only those road segments identified as being in Grand County and being part of the "D" road system (maintained "A" and "B" roads were not part of the road verification analysis). This process resulted in a selection of 21,285 road segments. Grand County submitted additional data (as of November 12, 2003), resulting in an additional 1167 segments which consisted of 1082 "D" roads as well as a few private roads. These additional segments totaled 787 miles.
2. BLM used commonly available statistics software[1] to determine how many road segments would need verification in order to establish at a 95% confidence level that the Grand County road data was accurate. This step produced a sample size of 377 segments for the May 2003 data, and 208 segments for the additional November 2003 data.
3. The above step assumes that the segments selected are chosen randomly. To accomplish this, BLM assigned (using MS Excel) a unique random number to each of the 21,285 segments identified in step 1. These segments were then sorted in random number order, with the first 377 segments brought forward for verification. A similar process was applied to the November 2003 data.
4. BLM next used ArcView 3.3 to display the road segments chosen in step 3, but now overlaid with digital aerial photographs taken in 2001-2002. In most cases, the road segment in question was easily recognized on the digitized aerial photo. In a few cases, the photo resolution was insufficient for positive verification. In those cases, BLM examined the

[1] A good website for this is www.pearsonncs.com/research-notes/sample-calc.htm

original hard copy of the photo. If the segment could not be verified in this manner, BLM undertook a field trip to conduct on the ground verification.

Using the above steps, BLM was able to positively verify the existence of 376 of the 377 (or 99.7%) May 2003 segment sample. The one segment not verifiable by aerial photograph analysis was visited by BLM personnel, but could not be found (see map and photos in the RMP administrative record). The segment in question lies on the edge of the White Wash Sand Dunes, an area characterized by blowing and drifting sand, adding to the difficulty of finding routes on the ground. Since the segments examined were a true random sample of the population of interest, BLM can be at least 95% confident that the May 2003 data provided by Grand County is 99.7% accurate.

The sample derived from the additional November 2003 data, in general, provided more of a verification challenge. Most of these routes were very faint in aerial photographs; nonetheless, all but three were identifiable in this manner. BLM undertook field verification of the remaining three segments. Combining the results of the two samples, and from aerial photography alone, BLM was thus able to verify 581 of 585 segments, or 99.3%.

In July, 2004, Grand County provided BLM, as part of RMP scoping, a travel plan for the County, which divided their original inventory into routes recommended for motorized use, routes preferred for such use, routes recommended for non-motorized use, and undetermined (mainly roads in Moab City and San Juan County, over which Grand County lacks jurisdiction). The net result of this plan was to recommend 2273 miles of the original inventory (on BLM) for non-motorized use. Table N.6 summarizes the Grand County road inventory and its proposed travel plan data, both in total miles within Grand County and on BLM lands within Grand County:

Table N.6. Road Inventory and Proposed Travel Plan provided by Grand County (miles)

Road Type	Grand Co Inventory (all lands)	Grand Co Inventory (BLM lands)	Grand Co Proposed Travel Plan[1] (all lands)	Grand Co Proposed Travel Plan (BLM lands)
"A" roads	280	184	280	184
"B" roads	1441	995	1441	995
"D" roads/other[2]	5544	4171	2940	1898
Total miles	7265	5350	4661	3077

[1] Includes routes recommended by Grand County for designation as open to motorized, as well as a number of "undetermined" routes. Some of these are outside Grand County 's jurisdiction (e.g., tribal, USFS), or left to the BLM 's "discretion".

[2]"other" consists primarily of old railroad grade and mapped pack trails, totaling 86.4 miles

Trail Mix, an entity established by Grand County, submitted data to BLM on December 15, 2004. Trail Mix represents various groups of generally non-motorized trail users (hikers, mountain bikers, equestrians) from Grand County, with some input as well from motorcycle users. Trail Mix's proposal, summarized in Table N.7, pertains to designation of various routes for specific uses (the last two categories contain recommendations which conflicted with the Grand County Travel Plan, discussed earlier).

Table N.7. Trail Mix Route Proposal

Route	Miles (BLM)
Proposed mechanized (both new single-track and existing, unmapped routes)	22.3
Proposed motorcycle	4.1
Proposed conversion of motorized to mechanized	15.9
Proposed conversion of motorized to non-mechanized	1.36

N.8.3
SAN JUAN COUNTY ROAD VERIFICATION

As discussed above, Grand County first presented BLM with an *inventory* of all routes mapped by the County. Grand County followed this with a travel *plan*, comprising far fewer routes than had been inventoried. In contrast, San Juan County did its inventory and travel plan simultaneously while in the field. This was accomplished, basically, by noticing that a route in question was receiving regular use, thus establishing that it had a purpose and need. Routes receiving no obvious use were seen, generally, as lacking purpose and need. Unlike Grand County, San Juan County did not inventory numerous routes visible on the ground.

The verification process for San Juan County (within the Moab Field Office boundary) consisted of two distinct step. For the first step, BLM undertook an on the ground verification of all routes in the County's database within a limited geographical area. BLM undertook this approach because of the availability of manpower in the area of interest, and also to compare and contrast the results from the two verification approaches. The area chosen for analysis was the Canyon Rims Recreation Area, and encompasses all San Juan road data west of Hatch Wash to the Moab Field Office boundary. The current on-site verification excluded those road segments already verified as part of the 1999 BLM Wilderness Inventory (located primarily near the western rim of Hatch Wash).

BLM personnel used hard copies of maps depicting San Juan County road data to locate and photograph each route so depicted. This process produced 322 Class D road segments[2] to verify, of which 317 were positively verified on the ground. Virtually all of the routes on the west rim of Hatch Wash had been documented in conjunction with the 1999 BLM Utah Wilderness Inventory. Field personnel were able to verify all but five of the remaining routes in late summer, 2003. As part of the 2003 process, BLM personnel prepared detailed logs of each road verified, accompanied by 215 digital photographs. The remaining 5 segments (inadvertently missed by field personnel) were easily identified from digital aerial photographs, using ArcView 3.3 GIS software.

The roads selected for verification in the process described above are not a random sample of all San Juan County road data within the boundaries of the Moab Field Office. To complete the road verification process, BLM performed a statistical analysis similar to that done for Grand County:

1. Using ArcView 3.3 GIS software and road data provided by San Juan County, BLM personnel segregated all "D" roads within the Moab Field Office boundary. This process produces 1576 road segments.

[2] Road segments ranged from 2.2 to 2733.1 meters in length, with typically many smaller segments comprising one "road". Thus, the number of "roads" which the typical observer might count is greater than the sum of the segments comprising these roads.

2. Using the same statistics software outlined earlier, BLM was able to determine that a random sample of 309 road segments would provide a 95% confidence level.
3. Using an ArcView extension, a random sample of 309 road segments was drawn from the original 1576 segment population.
4. BLM personnel used a variety of techniques to verify the existence of the sample segments, including on-site verification and use of digitized aerial photographs from 2001. Of the 309 segments sampled, 40 were verified using the data from step 1; nine were verified using data from the 1999 Utah Wilderness Inventory; and 259 were verified from digitized aerial photographs in GIS.

In March, 2005, BLM received information on 54 additional segments in the Moab Field Office from San Juan County. These routes totaled 50.8 miles, and were all verified using aerial photographs in GIS. As was the case with the additional data provided by Grand County, the data provided by San Juan County was generally fainter than their original data, but still definitely in existence.

N.8.4
ROAD DATA RECEIVED FROM PRIVATE SOURCES

On December 29, 2003, BLM received a communication from Ber Knight to the effect that he had GPS data on routes in San Juan County within the Moab Field Office that were not included in the San Juan County database. No information was provided on purpose and need for these routes, but simply on their existence. BLM has most (perhaps all) of this data in GIS. BLM initially attempted to verify this data with the same sampling techniques outlined above. It quickly became apparent that this approach would not be viable for this data, since a relatively large number of route segments could not be found. If any of these routes were to become part of the MFO transportation plan, it would be necessary to map and verify all of the new data.

To verify the Knight data, BLM started with the ArcView data in GIS. This data was then segregated to include only those routes that met the following criteria:

1. The route had to be in San Juan County, within the boundaries of the Moab Field Office, and at least a portion of it on public lands.
2. All routes lying entirely within the Canyon Rims Recreation Area (CRRA) were initially excluded. This is because San Juan County and BLM recently had reached agreement on a travel route designation plan for this area.

This process produced a population of 322 distinct route segments for verification. The segments had a mean length of 694 feet, with a range of less than 3 to more than 3700 feet. The verification process itself posed significantly greater challenges than had been posed for the Grand and San Juan County databases. Much of the Knight data had been gathered in an era when GPS technology was less advanced than today. This resulted in many route segments being discontinuous or poorly aligned with the (presumed) route being mapped. In many cases, it was difficult to determine which of several routes present in an aerial photograph was being mapped. In other cases, no route at all was visible, either due to GPS errors, or to the passage of time since the original measurement, during which the route may have become overgrown and difficult to locate. In still other cases, a Knight route turned out to be a "floating" segment, unconnected to any other route in the database. The great majority of routes (with the exception of those identical to routes in the San Juan County inventory) were very faint in aerial

photographs, especially when compared to County data. Generally, routes which are difficult to locate on such photos are even more difficult to locate on the ground.

Despite these difficulties, BLM was able to locate 289 of the 322 segments. To give these data the benefit of the doubt (and to recognize the inherent measurement error in older GPS technology), BLM considered a route "verified" if it lay within at least 100 feet of a visible route, and had the same approximate configuration.

Although BLM has reached agreement with San Juan County on travel routes within the Canyon Rims Recreation Area (CRRA), BLM felt it advisable to verify the Knight routes that lay within CRRA boundaries. Many of these routes are the same as San Juan County road data, and did not needed additional verification. Others, however, are not part of the County inventory, and thus need additional verification. Using the same techniques as discussed above, BLM was able to verify through aerial photography all but 35 of 787 Knight routes in CRRA (keeping in mind that many of these 787 routes coincided with San Juan County inventory data). Most of the routes which are not part of the County inventory are extremely faint seismic routes, and would likely be difficult for the average traveler to locate on the ground (most of these were GPSd some time ago, and may have been more visible at that time).

The purpose of the BLM road verification process was not to judge the condition, degree of maintenance, extent of use, or function of these routes, but simply to verify their physical existence.

The RMP administrative record contains maps of the road segments verified, photo and route logs, and photos.

In addition to the Ber Knight submission, discussed above, BLM received data from a variety of private sources as part of its scoping process. Table N.8 summarizes the data received, and how it has been incorporated into the travel planning process.

Table N.8. Routes Submitted by Private Sources

Submitted by:	Submission	Action
Book Cliff Rattlers	Motorcycle routes	Routes not part of Grand County road inventory were added to the GIS travel plan database. These routes were verified through a series of field trips (discussion follows later in this document).
Dale Parriott	Motorcycle routes	Routes not part of Grand County road inventory were added to the GIS travel plan database. Some routes appear to be nearly identical to Rattler routes. Through a series of field trips, BLM was only able to find clear evidence of one of these routes ("Mel's Loop South"); with the remaining routes either not fully identified or identified for only a short segment.
Red Rock 4Wheelers (several identical requests from others)	Several Jeep routes	Routes not part of Grand County road inventory were added to the GIS travel plan database. Verified by field checks.

Table N.8. Routes Submitted by Private Sources

Submitted by:	Submission	Action
Jim Bulkeley	Two Jeep routes	One route similar to above, but with non-existent connection (at least for full-size vehicles) to Cliffhanger route. Almost the entire first route is on State land. Second route (Devil's Slide off Hell's Revenge) not accompanied by maps, and therefore not analyzed.
Robert Telepak	Numerous Jeep routes	All routes (except one) seem to already be included in County or Red Rock 4 Wheelers road inventory data. "Missing" route added to the GIS travel plan database and verified from aerial photo.
Jeff Stevens	Two segments of a Jeep Safari route	In GIS travel plan database.
Robert Norton	Numerous Jeep routes	All MFO routes (for which data provided) in GIS travel plan database.
Ber Knight	Numerous Jeep routes in San Juan Co/MFO but not on SJ Co road map	Verified using same approach as for Grand and San Juan inventory data. See discussion above.
SULU/SPEAR	ATV trail recommendations, including approximately 32 miles of San Juan County "D" roads in MFO	Verified; proposal also suggests (as yet) unmapped additional routes not on San Juan inventory.
Jeremy Parriott	Short route Jeep in wash from private property to San Juan road	Proposed for inclusion in travel plan; added to the GIS travel plan database for consideration
Red Rock Heritage	Comprehensive travel plan for MFO	All routes based on Grand and San Juan road inventories. Excludes numerous routes included in both inventories, in order to enhance non-motorized recreation opportunities. Update received September 7, 2004, including rationale for previously provided map. Most, but not all, closure recommendations lie within areas proposed by the group for wilderness (see “Alternatives Eliminated from Further Analysis” in Chapter 2 of the Draft RMP/EIS for more information).
Moab Trail Alliance (MTA)	Mountain bike and equestrian routes	MTA provided BLM with a table and GIS data recommending a variety of new single track mountain biking trails, and one equestrian route. Additionally, MTA provided recommendations on converting several Grand County roads to mountain bike use. The new trail proposals were forwarded for consideration in the Recreation section of the RMP, while the recommendations for changes from motorized to non-motorized status were added to the GIS travel plan database for consideration.

Table N.8. Routes Submitted by Private Sources

Submitted by:	Submission	Action
Rory Tyler	OHV use in Hell-Roaring Canyon and in the Mill Creek WSA off the Steelbender 4WD route	On December 3, 2004, BLM received two maps and attached narratives outlining OHV damage in these two areas. Tyler specifically recommended that several spurs off the Steelbender route into the WSA be closed to motorized use, and that the upper reaches of Hell-Roaring Canyon also be closed to motorized use. Both problem areas addressed by Mr. Tyler are in areas currently closed to motorized travel (Mill Creek WSA), or limited to existing roads and trails (Hell Roaring Canyon). The Grand County inventory indicates no "claimed" spur at the Steelbender intersection referenced, and thus will not likely be part of the BLM travel plan under any alternative. The Grand County travel plan indicates a route up Hell-Roaring Canyon, which will be considered as part of BLM's alternative development. This route, however, does not go as far as the problem spots identified by Mr. Tyler. Should this area become closed or limited to designated routes, the travel observed by Mr. Tyler will become a law enforcement, rather than a travel plan, issue.

N.9
MOAB FIELD OFFICE TRAVEL PLAN - ALTERNATIVES DEVELOPMENT

N.9.1
GOAL

The goal of the travel plan is to provide opportunities for a range of motorized access and recreation experiences on public lands while protecting sensitive resources and minimizing conflicts among various users.

N.9.2
BLM POLICY: OHV DESIGNATIONS

OHV Designation Categories – BLM National Strategy mandates that all public lands administered by the BLM must be designated as Open, Limited, or Closed.

- Open – The BLM designates areas as "open" for intensive OHV use where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel. However, motor vehicles may not be operated in a manner causing or likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitat improvements, cultural or vegetative resources or other authorized uses of the public lands (See 43 CFR 8341).
- Limited – The "limited" designation is used where OHV use must be restricted to meet specific resource management objectives. In the current guidance context, this means limited

to designated roads and trails, i.e., a route network designated by the BLM in its RMP. These routes may also be limited to:

- A time or season of use depending on the resources in the area (i.e., Threatened and Endangered Species ' habitat or nesting areas, crucial winter ranges, etc.); and/or
- Type of vehicle use (ATV, motorcycle, four-wheel vehicle, etc.)

- Closed – The BLM designates areas as "closed" if closure to all vehicular use is necessary to protect resources, ensure visitor safety, or reduce resource or use conflicts. Access by means other than motor vehicle access is generally allowed. The Field Office Manager may allow motor vehicle access on a case-by-case basis or for emergencies.

A summary of the OHV designation categories (acreages) developed for the alternatives in the travel plan is provided in Table N.9.

Table N.9. Open, Limited and Closed Areas (acreages) for the Moab Field Office

Category	Alt A No Action[1]	Alt B Conservation	PROPOSED PLAN Balanced	Alt D Commodity
Closed	29,654	358,126	339,298	29,654
Limited to Existing	1,065,683	0	0	0
Limited to Designated	47,787	1,463,248	1,481,334	1,788,372
Open	678,250	0	1,866	3,348
Totals[2]	**1,821,374**	**1,821,374**	**1,821,374**	**1,821,374**

[1]No Action takes as baseline the 1985 Grand RMP and subsequent Federal Register actions.

[2]Excludes lands in the Moab Field Office managed by the BLM Vernal Field Office.

N.9.3
ROUTE DESIGNATION AND ID TEAM MEETINGS

Twenty-one ID team meetings to address route/resource conflicts and route designations were held from October 2004 through September 2005. The Field Office Manager conducted each meeting (except one), and every route proposed for designation in either Grand or San Juan County 's travel plans was evaluated. Additionally, the ID team evaluated whether there were routes not recommended for designation by either of the Counties that had a purpose and need requiring designation. The purpose of the route designation ID Team meetings was three-fold:

- Gather input from ID team on conflicts identified and mitigation proposed by each resource specialist. Identify (where known) the purpose and need for the route in question. Where conflicts with resources existed, these conflicts were discussed and resolved during the meeting, and final proposals for the various alternatives were established.
- Formulate three action alternatives for the travel plan. The Conservation alternative emphasizes resource conflicts over the purpose and need for the route. The Commodity alternative emphasizes the purpose and need for the route over resource conflicts. The Balanced alternative weighs both resource conflicts and the purpose and need.
- Develop a designed system of designated routes that fulfills the management goal for the planning area.

The RMP administrative record contains details of the conflicts identified for each route or route segment and BLM's conclusions as to designation, by alternative.

The ID team process was as follows. The Field Office Manager conducted all but one meeting. Each county's road inventory and travel recommendations were examined area by area, usually by USGS quad. In addition to County inventories, proposals by private groups were examined in the same fashion. Grand County, in its travel plan, had proposed that a large number of "D" roads in its inventory not be designated for motorized travel. In these cases, the County had been unable to identify a purpose and need for the routes in question. Many of these routes were considered redundant, in that other routes existed in the vicinity that were more suitable for motorized travel. In most cases, BLM agreed with the County's characterization of these routes, and did not include these in any of the action alternatives for designation. These routes were 2,594.8 miles in total. Routes proposed by either County for motorized designation were evaluated by the ID team for purpose and need (in consultation with the Counties), as well as potential resource concerns.

As discussed above, resource specialists identified potential conflicts with proposed routes, and characterized the severity of the conflict. In general, routes with serious resource conflicts (or less severe, but multiple conflicts), and no obvious purpose and need, were recommended for non-designation. There were many routes where resource concerns conflicted with established purpose and need. These routes typically were recommended for non designation in the Conservation alternative, but were designated in the Commodity alternative. Whether or not to designate a route in the Balanced alternative was decided by a weighing of the route's importance against the severity of the identified resource conflicts. In many cases, the potential conflict was resolved by reducing the number of parallel and redundant routes. Throughout the process, representatives of Grand and San Juan Counties were involved, and, in general, concurred with staff recommendations. The GIS data identifies those route segments which are recommended for non-designation, by alternative, and the principal resource concern(s) identified. These GIS files identify conflicts as cultural, riparian, recreation, soils, wilderness, and/or wildlife. The following sections explain the conflicts that existing routes could pose to these resources. In addition to resource issues identified through the ID team process, there is a large body of literature identifying potential impacts from OHV travel on a variety of resources.

The United States Geologic Survey (USGS) has compiled an extensive review of the available literature on the effects of OHV travel on public lands.[3] Their literature and Internet searches yielded approximately 700 peer-reviewed papers, magazine articles, agency and non-governmental reports, and internet websites regarding effects of OHV use as they relate to the Burea of Land Management’s standards of land health. In its Executive Summary, the USGS summarized its finding for a variety of natural resources and also socioeconomic implications as follows:

N.9.3.1
SOILS AND WATERSHED

The primary effects of OHV activity on soils and overall watershed function include altered soil structure (soil compaction in particular), destruction of soil crusts (biotic and abiotic) and desert

[3] *Environmental Effects of Off-Highway Vehicles on Bureau of Land Management Lands: A Literature Synthesis, Annotated Bibliographies, Extensive Bibliographies, and Internet Resources*, Douglas S. Ouren et al, United States Geological survey, Department of the Interior, 2007.

pavement (fine gravel surfaces) that would otherwise stabilize soils, and soil erosion. Indicators of soil compaction discussed in the OHV effects literature include soil bulk density (weight per unit of volume), soil strength (the soil's resistance to deforming forces), and soil permeability (the rate at which water or air infiltrate soil). Generally, soil bulk density and strength increase with compaction, whereas permeability decreases with compaction. As soil compaction increases, the soil's ability to support vegetation diminishes because the resulting increases in soil strength and changes in soil structure (loss of porosity) inhibit the growth of root systems and reduce infiltration of water. As vegetative cover, water infiltration, and soil stabilizing crusts are diminished or disrupted, the precipitation runoff rates increase, further accelerating rates of soil erosion.

N.9.3.2.
VEGETATION

Plants are affected by OHV activities in several ways. As stated above, soil compaction affects plant growth by reducing moisture availability and precluding adequate taproot penetration to deeper soil horizons. In turn, the size and abundance of native plants may be reduced. Above-ground portions of plants also may be reduced through breakage or crushing, potentially leading to reductions in photosynthetic capacity, poor reproduction, and diminished litter cover. Likewise, blankets of fugitive dust raised by OHV traffic can disrupt photosynthetic processes, thereby suppressing plant growth and vigor, especially along OHV routes. In turn, reduced vegetation cover may permit invasive and/or non-native plants – particularly shallow rooted annual grasses and early successional species capable of rapid establishment and growth – to spread and dominate the plant community, thus diminishing overall endemic biodiversity.

N.9.3.3.
WILDLIFE AND HABITAT

Habitats for native plants and animals, including endangered and threatened species, are impacted by OHVs in several ways. A salient effect is habitat fragmentation and reduced habitat connectivity as OHV roads and trails proliferate across the landscape. Reduced habitat connectivity may disrupt plant and animal movement and dispersal, resulting in altered population dynamics and reduced potential for recolonization if a species is extirpated from a given habitat fragment. Wildlife is also directly affected by excessive noise (decibel levels/noise durations well above those of typical background noise) and other perturbations associated with OHV activities. Disturbance effects range from physiological impacts – including stress and mortality due to breakage of nest-supporting vegetation, collapsed burrows, inner ear bleeding and vehicle-animal collisions – to altered behaviors and population distribution/dispersal patterns, which can lead to declines in local population size, survivorship, and productivity.

N.9.3.4
WATER QUALITY

The effects of OHV activities on water quality can include sedimentation (deposited solids), turbidity (suspended solids), and pollutants within affected watersheds. Sedimentation increases because compacted soils, disrupted soil crusts, and reduced vegetation cover can lead to increased amounts and velocities of runoff; in turn, this accelerates the rates at which sediments

and other debris are eroded from OHV use areas and flushed to aquatic systems downslope. Pollutants associated with deposition of OHV emissions and spills of petroleum products may be adsorbed to sediments, absorbed by plant material, or dissolved in runoff; once mobilized, these contaminants may enter aquatic systems.

N.9.3.5
AIR QUALITY

Air quality is affected when OHV traffic raises fugitive dust and emits by-products of combustion. Because wind can disperse suspended particulates over long distances, dust raised by OHV traffic can blanket plant foliage and disperse dust-adsorbed contaminants well beyond a given OHV-use area. Primary combustion by-products potentially affecting air quality in OHV use areas include (but are not limited to) polycyclic aromatic hydrocarbons, sulfur dioxide (SO_2), nitrogen oxides (NOx), and ozone (O_3). Although leaded gasoline has not been used in the United States since 1996, lead emissions deposited prior to the ban on leaded gasoline may persist for decades and continue impacting ecosystems as wind and water erosion continue to mobilize lead and other contaminants downwind (or downslope) of contaminated soils.

N.9.3.6
SOCIOECONOMIC IMPLICATIONS

Although not one of BLM's land health considerations, the socioeconomic implications of OHV use have significant direct and indirect effects on land health. As the popularity of OHV recreation increases, socioeconomic factors become increasingly important considerations in understanding and mitigating the overall effects of OHV use on land health. OHV recreation can have significant economic value to local communities where and when OHV use is popular; however, the economic costs to those communities remain unknown. OHV use can also lead to conflicts among different land users – both OHV users and people seeking non-motorized forms of recreation – within OHV use areas and nearby areas. Crowding of designated OHV areas may encourage unauthorized use in closed areas, and adjacent or overlapping use types may cause dissatisfaction or discourage recreation altogether, which can diminish public support for land management programs.

The report goes on for approximately 60 pages summarizing relevant literature. The references cited section runs 150 pages. The USGS concludes that the impacts of OHV use on a variety of resources are diverse and potentially profound. They argue that the results of impacts studies in the immediate vicinity of single trails and OHV sites have been reasonably consistent in documenting potentially negative impacts. They conclude that the results are less conclusive for wildlife, air and water quality than for the other resources examined. They emphasize the need for additional research on the cumulative effects on natural resources of OHV use, but speculate that the impacts could be greater in a network of OHV routes than for a single route.

N.9.3.7
CULTURAL

Existing routes may go through identified cultural or paleontological sites. Use of these routes may hasten erosion, exposing more of the site to natural or human-caused damage. Cross-

country travel in particular can exacerbate this problem. Site densities may be such that any access to the area could put such resources at risk. Routes identified with cultural conflicts totaled 136.9 miles.

N.9.3.8
RECREATION

Scoping has shown a desire on the part of some publics for more areas to be managed for non-motorized recreation. In response to this, BLM may decide to manage certain areas for more primitive forms of recreation, or to reduce user conflicts between motorized and non-motorized users. In such areas, and under different plan alternatives, the existence of certain roads (or a redundancy of such) may pose a conflict with underlying recreation management goals and objectives. Routes identified with recreation conflicts totaled 88.3 miles.

N.9.3.9
RIPARIAN

There are numerous streams, rivers, and other watercourses that run through the "limited" OHV category area. Routes are often located in riparian areas in canyons and drainage bottoms to avoid the more difficult uplands. Use of these routes can contribute to loss of riparian vegetation, degrade stream banks, and lead to erosion problems. There are also numerous washes within the "limited" OHV category area that do not support riparian vegetation, and merely provide a channel for water during storm events. Compaction of soils in these washes can lead to accelerated flood velocity, further contributing to erosion and sedimentary transfer. Routes identified with riparian conflicts totaled 118.9 miles; routes identified with floodplain conflicts totaled 230.2 miles.

N.9.3.10
SOILS

The primary watershed concern identified in the RMP (1985) was the prevention and reduction of salinity and sedimentation from public lands. Any surface disturbing activity, including routes, on sensitive soils will cause increases in salinity and sedimentation levels.

Roads and off-road travel can cause impacts to watersheds by impacting soil health and water quality. Impacts can include soil compaction, decreased soil stability, loss of vegetation and biotic soil crusts, loss of functioning floodplains, accelerated erosion, water quality degradation, and increased salinity contributions.

In order to meet Utah Rangeland Health Standards, surface disturbing activities, including roads, should be limited on highly saline soils, highly erodible soils, steep slopes, and drought intolerant soils. Routes identified with soils conflicts of all types totaled 662.5 miles.

N.9.3.11
WILDERNESS

Wilderness study areas (WSA) are managed under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) so as not to impair their suitability for preservation as wilderness. Each of these WSAs has wilderness characteristics. They are greater than 5,000 acres in size, natural in appearance, and provide outstanding opportunities for solitude

and/or primitive recreation. Many also possess supplemental wilderness values including cultural resources and wildlife values.

The IMP specifies that, at a minimum, motorized vehicles are only allowed on pre-existing inventoried ways in WSAs. Use of vehicles off boundary routes and on these ways is permitted only for emergencies, search and rescue operations, official purposes for the protection of human life, safety, and property; protection of lands and their resources, and to build and maintain structures and installations permitted under the IMP.

Today's OHVs are more varied, powerful machines capable of accessing steeper and rougher terrain than was possible over 20 years ago when the WSAs were designated. Motorized use in and around certain WSAs has increased dramatically, and involves sports utility vehicles (SUVs), trucks, all terrain vehicles (ATVs), and motorcycles. As discussed earlier, designating motorized routes within WSAs can lead to the impairment of wilderness character, whether through increased risks of off-road travel or intruding upon the solitude that wilderness users seek (See also 7.2.4). Routes identified with wilderness conflicts totaled 51.5 miles.

N.9.3.12
WILDLIFE

In general, roads can produce threats to wildlife populations due to habitat fragmentation, stress caused by human activities at critical times such as lambing, and impacts to resources (e.g., water, vegetation) upon which wildlife depend. Off-road travel can exacerbate these effects. Several species in the Moab Field Office may be particularly susceptible to human disturbance.

Big Game (bighorn sheep, deer, elk, pronghorn)

Disturbance from human activity can cause increased stress, making animals more susceptible to disease and parasites, and leading to habitat abandonment and fragmentation of habitat. Within bighorn sheep habitat, the Range-wide Plan for Managing Habitat for Desert Bighorn Sheep on Public Lands (U.S. Department of the Interior, BLM, undated) recommends that new road construction be minimized and roads no longer serving a definite purpose be closed. The Plan further recommends that off-road vehicles be limited to existing roads and trails.

Birthing grounds are, by far, the most crucial habitat. Additional stress and pressure from human activities can deplete energy reserves, as well as disease and parasite resistance in pregnant and lactating animals with young at their sides. This reduces the survival rate of newborns.

White-tailed and Gunnison Prairie Dogs

Populations have been decimated by sylvan plague, and restoration of habitat is required for re-colonization. Limiting new roadways and decommissioning unnecessary roads, as well as reclaiming illegal trails, will help to lessen the impacts to prairie dog habitat fragmentation.

Greater and Gunnison Sage-grouse

Within the Moab FO, reduction of human disturbance and fragmentation is needed to protect remaining sage-grouse habitat. Limiting new roadways, decommissioning unnecessary roads and reclaiming illegal trails will help reduce habitat fragmentation and protect the birds and their habitat from human disturbance.

Routes identified with wildlife conflicts totaled 129.9 miles, of which 52.6 miles conflicted with bighorn sheep habitat.

Table N.10. Miles of Route Designated/not designated for Motorized Travel Due To Resource Conflicts, By Alternative

Resource Conflicts		Alternatives			
		A	B	PROPOSED PLAN	D
Cultural	Designated	148.2	102	131.6	144.6
	Not Designated		46.5	16.6	3.6
Recreation	Designated	178.2	57.6	118.4	148.5
	Not Designated		121	59.8	29.7
Riparian	Designated	321.9	110	269.8	305.2
	Not Designated		179	50.1	14.7
Soils	Designated	960.3	623	792.8	909.3
	Not Designated		338	167.5	51.0
Wilderness	Designated	82.5	0.0	1.7	16.0
	Not Designated		82.5	80.8	66.5
Wildlife	Designated	367.4	235	315.6	356.3
	Not Designated		132	51.8	11.1

N.9.4.
MECHANIZED ROUTES (SEE MAP 4)

Mechanized use includes mechanical devices such as bicycles that are not motorized. Moab BLM concluded that routes not designated for motorized travel generally would be available for mechanized, foot, and equestrian travel. As with all designations in the travel plan, BLM reserves the right to change designations in the future, should resource issues warrant such action. Exceptions to permitting mechanized use on routes not designated for motorized use are "ways" in WSAs. In those cases where motorized use on such routes is prohibited, the same prescriptions would apply to mechanized use, as a means of enhancing wilderness values. The same would apply to routes not designated for motorized use in those areas the BLM chooses to manage to preserve wilderness characteristics. In addition, routes not designated for motorized use will not be available for mechanized use in areas identified as hiking or other non-mechanized focus areas.

Exceptions to the non-mechanized policy in WSAs include the Hidden Valley trail and the Porcupine Rim trail (single-track portion). Under IMP, BLM reserves the right to close these trails to mechanized use, should such use lead to degradation of resource values.

N.9.5
FOOT AND EQUESTRIAN TRAVEL

Foot and equestrian travel would continue to be allowed in all areas of the Field Office, except as specifically prohibited. Under all alternatives, the following trails would be open to foot traffic only:

- Negro Bill Canyon Trail
- Hunter Canyon Trail
- Fisher Towers Trail

- Amphitheater Loop Trail
- Mill Canyon Dinosaur Trail
- Copper Ridge Sauropod Trail
- Corona Arch Trail
- Windwhistle Nature Trail

Under all alternatives, the following trails would be open to foot and equestrian traffic only:

- Trough Springs Trail
- Onion Creek Benches Trail
- Ida/Stearns Gulch Equestrian Trail System
- Castle Creek Equestrian Trail
- Rattlesnake Trail above Nefertiti Boat Launch
- Upper portions of Seven Mile Canyons
- Red Rock Horse Trails (near Ken 's Lake)

N.10
PLAN MAINTENANCE AND CHANGES TO ROUTE DESIGNATIONS

The RMP must include indicators to guide future plan maintenance, amendments, or revisions related to OHV area designations or the approved road and trail system within "Limited" areas. Indicators could include results of monitoring data, new information, or changed circumstances (IM 04-005, Attachment 2). Actual route designations within the "Limited" category can be modified without completing a plan amendment, although NEPA compliance is still required. The Federal regulations at 43 CFR 8342.3 state:

> The authorized officer shall monitor effect of the use of off-road vehicles. On the basis of information so obtained, and whenever the authorized officer deems it necessary to carry out the objectives of this part, designations may be amended, revised, revoked, or other action taken pursuant to the regulation in this part.

Within the RMP, Field Offices must establish procedures for making modifications to their designated route networks. Because future conditions may require the designation or construction of new routes or closure of routes in order to better address resources and resource use conflicts, a Field Office will expressly state how modification would be evaluated. As noted in IM 2004-061, plan maintenance can be accomplished through additional analysis and land-use planning, e.g., activity level planning. BLM will collaborate with affected and interested parties in evaluating the designated road and trail network for suitability for active OHV management and envisioning potential changes in the existing system or adding new trails that would help meet current and future demands. In conducting such evaluations, the following factors would be considered:

- Routes suitable for different categories of OHVs including dirt bikes, ATVs, dune buggies, and 4-wheel drive touring vehicles, as well as opportunities for joint trail use;
- Needs for parking, trailheads, informational and directional signs, mapping and profiling, and development of brochures or other materials for public dissemination;
- Opportunities to tie into existing or planned route networks;

- Measures needed to avoid onsite and offsite impacts to current and future land-uses and important natural resources; among others, issues include noise and air pollution, erodible soils, stream sedimentation, non-point source water pollutions, listed and sensitive species' habitats, historic and archeological sites, wildlife, special management areas, grazing operations, fence and gate security, needs of non-motorized recreationists, and recognition of property rights for adjacent landowners;
- Public land roads or trails determined to cause considerable adverse effects or to constitute a nuisance or threat to public safety would be considered for relocation or closure and rehabilitation after appropriate coordination with applicable agencies and partners.
- Those areas managed as Closed will not be available for new motorized or mechanized route designation or construction.

Regulations at 43 CFR 8342.2 require BLM to monitor the effects of OHV use. Changes should be made to the Travel Plan based on the information obtained through monitoring. Procedures for making changes to route designations after the ROD is signed are established in the RMP. Site specific NEPA documentation is required in order to change the route designations in this Travel Plan.

N.11
COOPERATING AGENCIES AND OTHER COORDINATION

A Cooperating Agency is an agency other than the lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a major federal action.

N.11.1
COOPERATING AGENCIES

Copies of meeting minutes are found in the BLM Moab Field Office Administrative Record.

Grand and San Juan Counties. As described in this document, both counties have played integral roles in the Moab Field Office's travel plan development.

State of Utah, State Parks. Meetings were held with State Parks personnel regarding the travel plan.

State of Utah, School Institutional Trust Land Administration (SITLA). A meeting with SITLA representatives held was at the Moab Field Office. On-going consultations continue to address BLM and SITLA management concerns.

State of Utah, Department of Wildlife Resources (DWR). DWR provided input to the draft alternatives matrix.

State of Utah, State Historic Preservation Office (SHPO). The USHPO is consulted on cultural aspects both through the RMP process and for all pertinent activity level, site-specific NEPA where cultural resources are concerned.

U.S. Fish and Wildlife Service (USFWS). Letters from the USFWS concerning on-going issues with sensitive species are the basis for choices made by the ID team in evaluating wildlife conflicts.

National Forest Service, Manti La Sal National Forest.

National Park Service, Arches and Canyonlands National Parks.

N.11.2
OTHER COORDINATION

Native American Tribes. Native American Tribes are consulted on all site-specific NEPA where there are cultural concerns.

BLM Monticello Field Office. Coordination with the Monticello FO has been consistent from the outset of travel planning and the RMP process. Edge matching of boundaries has been accomplished.

Other Adjoining BLM Field Offices. The Moab Field Office has contacted the Vernal, Grand Junction, Montrose and Durango Field offices in the course of travel plan development (with the exception of Vernal, these Field Offices' adjoining areas are currently Open to OHV travel).

N.12
IMPLEMENTATION PROCESS

Implementation decisions are actions to implement land-use plans and generally constitute BLM's final approval allowing on-the-ground actions to proceed. These types of decisions are based on site-specific planning and NEPA analyses and are subject to the administrative remedies set forth in the regulations that apply to each resource management program of the BLM. Implementation decisions are not subject to protest under the planning regulations. Instead, implementation decisions are subject to various administrative remedies. Where implementation decisions are made as part of the land-use planning process, they are still subject to the appeals process of other administrative review as prescribed by specific resource program regulations after BLM resolves the protests to land-use plan decisions and make a decision to adopt or amend the RMP.

Travel planning and implementation process includes the following:

- A map of roads and trails for all travel modes.
- Notations of any limitation for specific roads and trails.
- Criteria to select or reject roads and trails in the final travel management network, add new roads or trails, and to specify limitations.
- Guidelines for management, monitoring, and maintenance of the system.
- Needed easements and rights-of-ways (to be issued to the BLM or others) to maintain the existing road and trail network providing public land access.

In addition, travel management networks should be reviewed periodically to ensure that current resource and travel management objectives are being met (43 CFR 8342.3).

In the final RMP decisions, designated OHV routes will be portrayed by a map entitled "Field Office Travel Plan and Map". This map will be the basis for signing and enforcement. The Field Office will prioritize actions, resources, and geographic areas for implementation. The implementation goals include completing signage, maps, public information, kiosks, and working with partners.

N.13
REFERENCES

- 43 C.F.R. Part 8340
- BLM Moab and Monticello Field Office, Planning Bulletin #3 – Request for Route Data, November 1, 2003
- BLM Moab and Monticello RMP Revisions, Scoping Summary, July 2004
- BLM Moab Field Office, Analysis of Management Situation (AMS), January 2005
- BLM Land-use Planning Handbook 1601
- NRCC Technical Team, State-wide OHV Trail Signing Standards (from Utah BLM State Office, September 5, 2001
- Natural Resource Coordinating Council (NRCC) Utah Interagency OHV Steering Committee, Final Report, April 1, 2004
- Standards for Rangeland Health of BLM Land in Utah, May 1997
- U.S. Department of the Interior, BLM, Interim Management Policy for Lands Under Wilderness Review, H-8559-1
- U.S. Department of the Interior, BLM, National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, January 2001
- Utah OHV Transactions by County and Fiscal Year, 2005

ATTACHMENT A: DEFINITIONS

All-Terrain Vehicle (ATV) – A wheeled or tracked vehicle, other than a snowmobile or work vehicle, designed primarily for recreational use of the transportation of property or equipment exclusively on undeveloped road rights of way, marshland, open country or other unprepared surfaces. (BLM, National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, January 2001)

Closed Designations – Areas or trails are designated closed if closure to all vehicular use is necessary to protect resources, promote visitor safety, or reduce use conflicts. (8342.06 E)

Considerable Adverse Impacts – Any OHV related adverse environmental impact that causes: (a) significant damage to cultural or natural resources, including but not limited to historic, archaeological, soil, water, air, vegetation and scenic values, or (b) significant harassment of wildlife and/or significant disruption of wildlife habitats; or (c) significant damage to endangered or threatened species or their habitat, or (d) impairment of wilderness suitability; *and* is irreparable due to the impossibility or impracticality of performing corrective or remedial actions. The significance of these damages is determined on a case-by-case basis by BLM's authorized officers in the field (normally District [Field Office] Managers) in the context of local conditions. (8341.05)

Designation – The formal identification of public land areas and trails where off-road vehicles use has been authorized, limited, or prohibited through publication in the *Federal Register*. The types of designation used by the BLM are open, limited, or closed to off-road vehicle use. (8342.05)

Emergency Limitations or closures – Limiting use or closing areas and trails on public lands to ORV use under the authority of 43 CFR 8341.2. Such limitations or closures are not OHV designations. (8341.05)

Implementation Plan - A site-specific plan written to implement decisions made in the land-use plan. An implementation plan usually selects and applies best management practices (BMP) to meet land-use plan objectives. Implementation plans are synonymous with "activity" plans. Examples of implementation plans include interdisciplinary management plans, habitat management plans, and allotment management plans. (BLM, National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, January 2001)

Land-use Plan: A set of decisions that establish management direction for land within an administrative areas, as prescribed under the planning provisions of FLPMA; and assimilation of land-use plan-level; decisions developed through the planning process outlines in 43 CFR 1600, regardless of the scale at which the decisions were developed. (BLM, National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, January 2001)

Limited Designations – The limited designation is used where OHV use must be restricted to meet specific resource management objectives. Examples of limitations include: number or types of vehicles; time or season of use; permitted or licensed use only; use limited to designated roads and trails; or other limitations if restrictions are necessary to meet resource management objectives including certain competitive or intensive use areas which have special limitations. (8342.06 F)

Mechanized Travel – Moving by a mechanical device such as a bicycle, not powered by a motor

Minimize OHV Damage – To reduce ORV effects to the maximum extent feasible short of eliminating ORV use, consistent with established land management objectives as determined by economic, legal, environmental, and technological factors. (8342.05)

Motorized Travel – Moving by means of vehicles that are propelled by motors such as cars, trucks, OHVs, motorcycles, etc.

Non-Motorized Travel – Moving by foot, stock or pack animal, boat, or mechanized vehicle such as a bicycle

Off-Highway Vehicle (OHV): OHV is synonymous with, and the more current term for, Off-Road Vehicles (ORV). ORV is defined in 43 CFR 8340.0-5(a): Off-road vehicle means any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding: 1) Any non-amphibious registered motorboat; 2) Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; 3) Any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; 4) Vehicles in official use; and 5) Any combat or combat support vehicle when used in times of national defense emergencies.

OHV area designations: Refers to the land-use plan decisions that permit, establish conditions, or prohibit OHV designations (43 CFR 8342.1). The CFR requires all BLM-managed public lands to be designated as open, limited, or closed to off-road vehicles, and provides guidelines for designation. The definitions of open, limited, and closed are provided in 43 CFR 8340-5 (f), (g), and (h), respectively.

Open Designations – Open designations are used for intensive ORV use areas where there are no special restrictions or where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel. (8342.06 D)

RMP area - Most RMPs cover a large planning and management area. As a result, the planning area may be divided into smaller areas, each with differing values, issues, needs and opportunities that may warrant differing management prescriptions. (Attachment to IM 2004-005)

Road Definitions (State of Utah Highway Codes 27-12-21, 22, 23):
Class A: State Highways
Class B: County roads constructed and maintained from the state road fund.
Class C: City streets within the corporate limits of the cities and towns of the state that are not class A or class B roads.
Class D (27-15-1): Any road, way, or other land surface route that has been or in established by use or constructed and is maintained (passable for vehicles with four or more wheels) to proved usage by the public that is neither a class A, class B, or class C road.

Road and Trail Selection - For each limited area, the BLM should choose a network of roads and trails that are available for motorized use, and other access needs including non-motorized and non-mechanized use, consistent with the goals and objectives and other consideration described in the plan. (Attachment to IM 2004-005)

Road and Trail Identification: For the purposes of this guidance, road and trail identification refers to the on-the-ground process (including signs, maps and other means of informing the public about requirements) of implementing the road and trail network selected in the land-use plan or implementation plan. Guidance on the identification requirements is in 43 CFR 9342.2©. (Attachment to IM 2004-005)

"Ways" - See pp 11-12 Section 7.2.4 – Route Designations in Wilderness Study Areas.

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APPENDIX O.

HYDRAULIC CONSIDERATIONS FOR PIPELINES CROSSING STREAM CHANNELS

Suggested citations:

Fogg, J. and H. Hadley. 2007. Hydraulic considerations for pipelines crossing stream channels. Technical Note 423. BLM/ST/ST-07/007+2880. U.S. Department of the Interior, Bureau of Land Management, National Science and Technology Center, Denver, CO. 18 pp. *http://www.blm.gov/nstc/library/techno2.htm.*

U.S. Department of the Interior. 2007. Hydraulic considerations for pipelines crossing stream channels. Technical Note 423. BLM/ST/ST-07/007+2880. Bureau of Land Management, National Science and Technology Center, Denver, CO. 18 pp. *http://www.blm.gov/nstc/library/techno2.htm.*

ABSTRACT

High flow events have the potential to damage pipelines that cross stream channels, possibly contaminating runoff. A hydrologic analysis conducted during the design of the pipeline can help determine proper placement. Flood frequency and magnitude evaluations are required for pipelines that cross at the surface. There are several methods that can be used, including reconnaissance, physiographic, analytical, and detailed methods. The method used must be appropriate for the site's characteristics and the objectives of the analysis. Channel degradation and scour evaluations are required for pipelines crossing below the surface. Proper analysis and design can prevent future pipeline damage and reduce repair and replacement costs.

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INTRODUCTION

In 2002, the U.S. Fish and Wildlife Service raised concerns about the potential for flash floods in ephemeral stream channels to rupture natural-gas pipelines and carry toxic condensates to the Green River, which would have deleterious effects on numerous special-status fish species (Figure 1). In November of the same year, BLM hydrologists visited the Uinta Basin in Utah to survey stream channels and compute flood magnitudes and depths to better understand possible flooding scenarios. From this they developed construction guidance for pipelines crossing streams in Utah. This guidance was later modified so that it was generally applicable to the arid and semiarid lands of the intermountain west. It may also have general applicability in other areas of the western United States. The purpose of this document is to present the modified guidance for placement of pipelines crossing above or below the surface of stream channels to prevent inundation or exposure of the pipe to the hydraulic forces of flood events.

Figure 1. Pipeline breaks during flooding can release condensate toxic to sensitive fish species.

SURFACE CROSSINGS

Pipelines that cross stream channels on the surface should be located above all possible floodflows that may occur at the site. At a minimum, pipelines must be located above the 100-year flood elevation and preferably above the 500-year flood elevation. Two sets of relationships are available for estimating flood frequencies at ungaged sites in Utah. Thomas and Lindskov (1983) use drainage basin area and mean basin elevation for flood estimates for six Utah regions stratified by location and basin elevation (Table 1). Thomas et al. (1997) also use drainage area and mean basin elevation to estimate magnitude and frequency of floods throughout the southwestern U.S., including seven regions that cover the entire State of Utah. Results from both sets of equations should be examined to estimate the 100- and 500-year floods, since either of the relations may provide questionable results if the pipeline crosses a stream near the boundary of a flood region or if the drainage area or mean basin elevation for the crossing exceed the limits of the data set used to develop the equations.

Table 1. Examples of Flood Frequency Equations for Ungaged Sites in Utah

Regression equations for peak discharges for Uinta Basin (from Thomas and Lindskov 1983)			
Discharge Q in cubic feet per second, Area in square miles, Elevation in thousands of feet			
Recurrence interval (yrs)	**Equation**	**Number of stations used in analysis**	**Average standard error of estimate (%)**
2	$Q = 1{,}500\ A^{0.403}\ E^{-1.90}$	25	82
5	$Q = 143{,}000\ A^{0.374}\ E^{-3.66}$	25	66
10	$Q = 1.28 \times 10^{6}\ A^{0.362}\ E^{-4.50}$	25	64
25	$Q = 1.16 \times 10^{7}\ A^{0.352}\ E^{-5.32}$	25	66
50	$Q = 4.47 \times 10^{7}\ A^{0.347}\ E^{-5.85}$	25	70
100	$Q = 1.45 \times 10^{8}\ A^{0.343}\ E^{-6.29}$	25	74

Procedures for estimating 100-year and 500-year flood magnitudes for other States are described in the U.S. Geological Survey's National Flood Frequency Program (Ries and Crouse 2002) (Figure 2). Full documentation of the equations and information necessary to solve them is provided in individual reports for each State. The National Flood Frequency (NFF) Website (http://water.usgs.gov/software/nff.html) provides State summaries of the equations in NFF, links to online reports for many States, and factsheets summarizing reports for States with new or corrected equations. Background information in each State's flood frequency reports should be checked to ensure that application of the equations is not attempted for sites with independent variables outside the range used to develop the predictive equations.

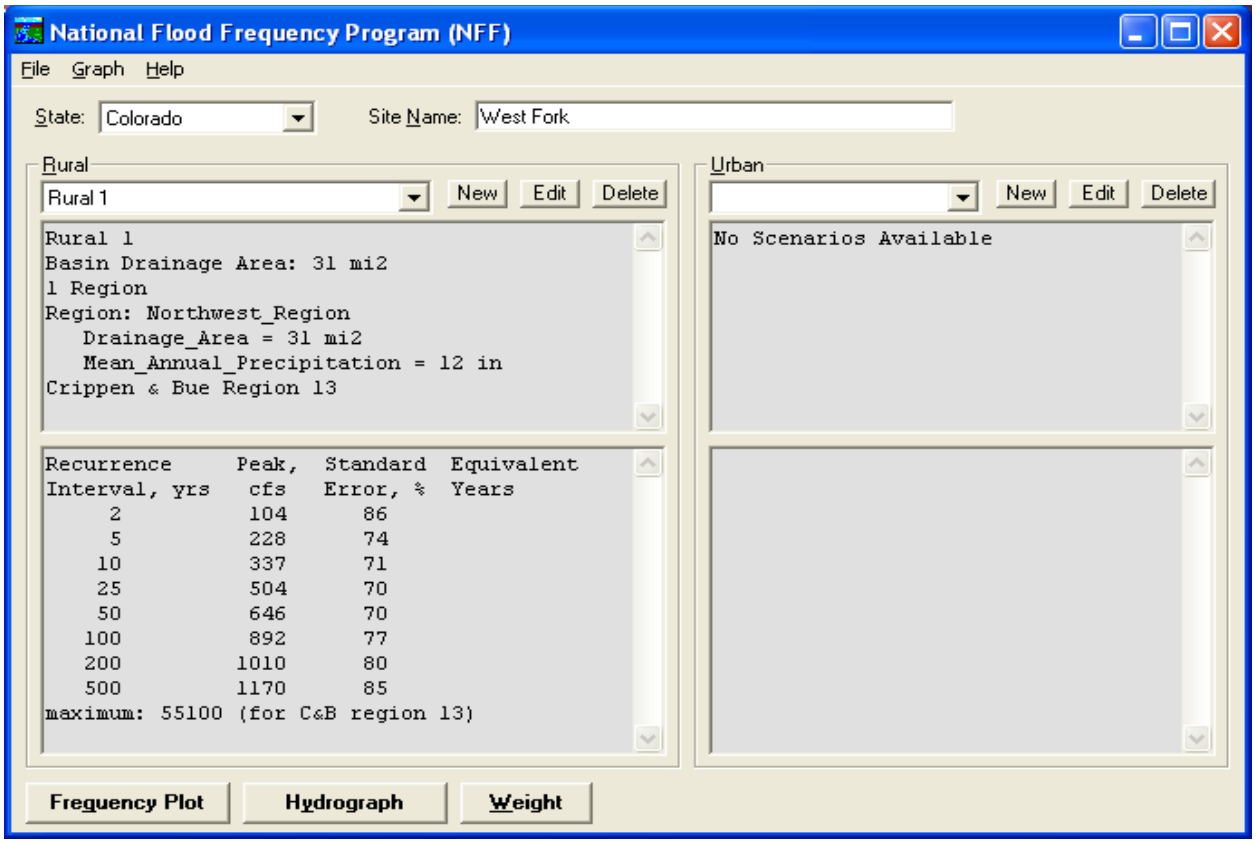

Figure 2. View of the output from NFF.

Once the flood frequency for a site has been estimated, determining the depth of flow associated with an extreme flood (i.e., the elevation of the pipeline at the crossing) may be approached in a number of ways. Procedures for estimating depth of flow for extreme floods in Utah are presented in Thomas and Lindskov (1983). Similar procedures presented in Burkham (1977, 1988) are generally applicable for locations throughout the Great Basin and elsewhere. The reconnaissance, physiographic, analytical, and detailed methods described in those reports will be summarized briefly in this paper. Burkham (1988) describes an additional method (historical method) not presented here, since the data for its use (high-water marks for an extreme historical flood with known discharge and recurrence interval) are rarely available in public land situations for which this guidance is intended.

RECONNAISSANCE METHOD

The reconnaissance method (as the name implies) is a fairly rough and imprecise method for delineating flood-prone areas (Burkham 1988; Thomas and Lindskov 1983). It is most applicable to stable or degrading alluvial channels with multiple terrace surfaces, although such terraces may be difficult to detect on severely degrading streams. In this procedure, the channel of interest is examined to approximate the area that would be inundated by a large flood. A geomorphic reconnaissance of the site is conducted, and it may be supplemented with aerial photos, maps, and historical information available for the reach of interest. In addition to the morphology of the channel, floodplain, and terraces, information on vegetation (e.g., species,

flood tolerance, drought tolerance) and soils (e.g., development, stratification, and drainage) can be helpful for identifying flood-prone areas (Burkham 1988). For best results, the geomorphic analysis should include reaches upstream and downstream of the site and should attempt to determine the general state of the stream channel as aggrading, degrading, or stable. (Additional guidance on detection of stream degradation is presented in the section on subsurface crossings).

In the reconnaissance method, identification of bankfull elevation and the active floodplain (i.e., floodplain formed by the present flow regime) provides **inadequate** conveyance for extreme flood events (Figure 3). Past floodplains or present terraces also must be identified, since these surfaces may be inundated by extreme floods in the present flow regime, especially in arid and semiarid environments. Pipelines should be constructed so that they cross at or above the elevation of the highest and outermost terrace (Figure 4). The highest terrace is unlikely to be accessed in the modern flow regime by any but the most extreme floods.

Practitioners of the reconnaissance method need considerable experience in geomorphology, sedimentation, hydraulics, soil science, and botany. Also, since this method is based on a geomorphic reconnaissance of the site, no flood frequency analysis is required and no recurrence interval can be assigned to the design elevation. An additional drawback to the method is that the accuracy of the results is unknown. However, the reconnaissance method may be the most rational one for delineating flood-prone areas on some alluvial fans and valley floors where channels become discontinuous (Burkham 1988). While this is the quickest approach to designing a pipeline that crosses a channel, it likely will result in the most conservative estimate (i.e., highest elevation and greatest construction cost) for suspension of the pipeline.

Figure 3. Although this pipeline crossed above the bankfull channel indicators, it was not high enough to escape more extreme floods.

Figure 4. This New Mexico pipeline crosses the channel near the elevation of the highest terrace, which places it above even the most extreme flood events.

PHYSIOGRAPHIC METHOD

A slightly more intensive approach to designing pipelines that cross streams is based on the physiographic method for estimating flood depths at ungaged sites described by Thomas and Lindskov (1983) and Burkham (1988). The procedure uses regional regression equations (similar to the flood frequency equations described above) to estimate **maximum** depth of flow associated with a specified recurrence-interval flood (Table 2). Flood depth is then added to a longitudinal survey of the channel **thalweg** in the vicinity of the crossing (10 to 20 channel widths in length), resulting in a longitudinal profile of the specified flood. Elevation of the flood profile at the point of pipeline crossing is the elevation above which the pipeline must be suspended. The method is generally applicable where 1) the project site is physiographically similar to the drainage basins used to develop the regression equations and 2) soil characteristics are the same at the project site as in the basins where the regression equations were developed. While this procedure requires a field survey and calculation of flood depths at points along the channel, it may result in a lower crossing elevation (and possibly lower costs) for the pipeline. Also, since the regional regression equations estimate flood depths for specific recurrence-interval floods, it is possible to place a recurrence interval on the crossing design for risk calculations. However, regional regression equations linking depth of flood to recurrence interval have not been developed for many areas. In States where they have been developed (e.g., Alabama, Colorado, Illinois, Kansas, and Oklahoma), standard errors of the estimates have ranged from 17 to 28 percent, with an average standard error of 23 percent (Burkham 1988).

Table 2. Examples of Depth Frequency Equations for Ungaged Sites in Utah

Regression equations for flood depths for Uinta Basin (from Thomas and Lindskov 1983)			
Flood depth D in feet, Area in square miles, Elevation in thousands of feet			
Recurrence interval (yrs)	**Equation**	**Number of stations used in analysis**	**Average standard error of estimate (%)**
2	$D = 1.03\ A^{0.159}$	16	30
5	$D = 13.3\ A^{0.148} E^{-1.03}$	16	28
10	$D = 68.6\ A^{0.131}\ E^{-1.69}$	16	26
25	$D = 556\ A^{0.128}\ E^{-2.59}$	16	24
50	$D = 1330\ A^{0.123}\ E^{-2.95}$	15	24
100	$D = 1210\ A^{0.130}\ E^{-2.86}$	14	22

ANALYTICAL METHOD

The analytical method described by Burkham (1988) uses uniform flow equations to estimate depth of flow associated with a particular magnitude and frequency of discharge. Typically, a trial-and-error procedure is used to solve the Manning uniform flow equation for depth of flow, given a design discharge (i.e., a flood of specified recurrence interval), a field-surveyed cross section and channel slope, and an estimate of the Manning roughness coefficient (*n*). Numerous software packages are available to facilitate the trial-and-error solution procedure (e.g., WinXSPRO). Since the Manning formula is linear with respect to the roughness coefficient, estimating this coefficient can be a significant source of error and is likely the most significant weakness in this approach. Estimating roughness coefficients (*n* values) for ungaged sites is a matter of engineering judgment, but *n* values typically are a function of slope, depth of flow, bed-material particle size, and bedforms present during the passage of the flood wave. Guidance is available in many hydraulic references (e.g., Chow 1959). Selecting *n* values for flows above the bankfull stage is particularly difficult, since vegetation plays a major role in determining resistance to flow. Barnes (1967) presents photographic examples of field-verified *n* values, and Arcement and Schneider (1989) present comprehensive guidance for calculating *n* values for both channels and vegetated overbank areas (i.e., floodplains). Depth of flow determined with uniform flow equations, such as the Manning equation, represents **mean** depth of flow to be added to the **cross section** at the site of the pipeline crossing.

Burkham (1977, 1988) also presented a simplified technique for estimating depth of flow, making use of the general equation for the depth-discharge relation:

$$d = C\,Q^{f}$$

Values of *f* (the slope of the relationship when plotted on logarithmic graph paper) can be determined from "at-station" hydraulic geometry relationships at gaging stations in the region. Only the upper portion of the gaging-station ratings should be used to derive the slope (*f* value) for application to extreme floods, since a substantial portion of the flow may be conveyed in the overbank area. Alternatively, Burkham (1977, 1988) presents a simplified procedure for estimating *f* that requires only a factor for channel shape. Leopold and Langbein (1962)

computed a theoretical value of 0.42 for natural channels, while Burkham (1988) computed a theoretical value of 0.46 for parabolic cross sections. Burkham (1977) earlier reported an average *f* value of 0.42 from 539 gaging stations scattered along the eastern seaboard and upper Midwest, while Leopold and Maddock (1953) reported an average *f* value of 0.40 for 20 river cross sections in the Great Plains and the Southwest. Park (1977) summarized *f* values from 139 sites around the world and found most values occurred in the range of 0.3 to 0.4. Additional assumptions in Burkham (1977, 1988) enable an estimate of the coefficient *C* in the depth-discharge relationship with only a single field measurement of width and maximum depth at some reference level in the channel (e.g., bankfull stage) (Burkham 1977, 1988). Depth of flow determined from Burkham's simplified technique represents **maximum** depth of flow to be added to the **thalweg** at the cross section.

The analytical methods described by Burkham (1977, 1988) generally will be more accurate than the physiographic and reconnaissance methods described previously; thus, they may result in lower pipeline elevations and construction costs than the previous methods. However, analysis of flood elevations for the most sensitive situations should probably be conducted with the detailed method described below.

DETAILED METHOD

Additional savings in construction costs for pipelines crossing channels may be realized by applying a detailed water-surface-profile model of flow through the crossing site. The water-surface-profile model requires a detailed survey of both the longitudinal channel profile (at least 20 channel widths in length) and several cross sections along the stream (Figure 5). Design flows (e.g., 100-year and 500-year floods) are calculated for the channel at the crossing with the regional regression equations described above and routed through the surveyed channel reach using a step-backwater analysis. The step-backwater analysis uses the principles of conservation of mass and conservation of energy to calculate water-surface elevations at each surveyed cross section. Computed water-surface elevations at successive cross sections are linked to provide a water-surface profile for the flood of interest through the reach of interest. The computations are routinely accomplished in standard software, such as the U.S. Army Corps of Engineers' HEC-RAS model. Whereas the analytical methods described previously assume steady, uniform flow conditions through the reach, a detailed water-surface-profile model is capable of handling both gradually and (to some extent) rapidly varied flow conditions. Since the computation uses a detailed channel survey, it is the most accurate method to use; however, it is likely the most expensive method for the same reason. Burkham (1988) indicates that the error in flood depths predicted from step-backwater analysis can be expected to be less than 20 percent. The step-backwater computations require an estimate of the Manning roughness coefficient (*n*) as an indicator of resistance to flow and assume fairly stable channel boundaries. Estimation of the roughness coefficient (*n*) includes the same considerations discussed previously for the analytical methods. The assumption of fairly stable channel boundaries is not always met with sand-bed channels and is an issue of considerable importance for designing subsurface pipeline crossings as well.

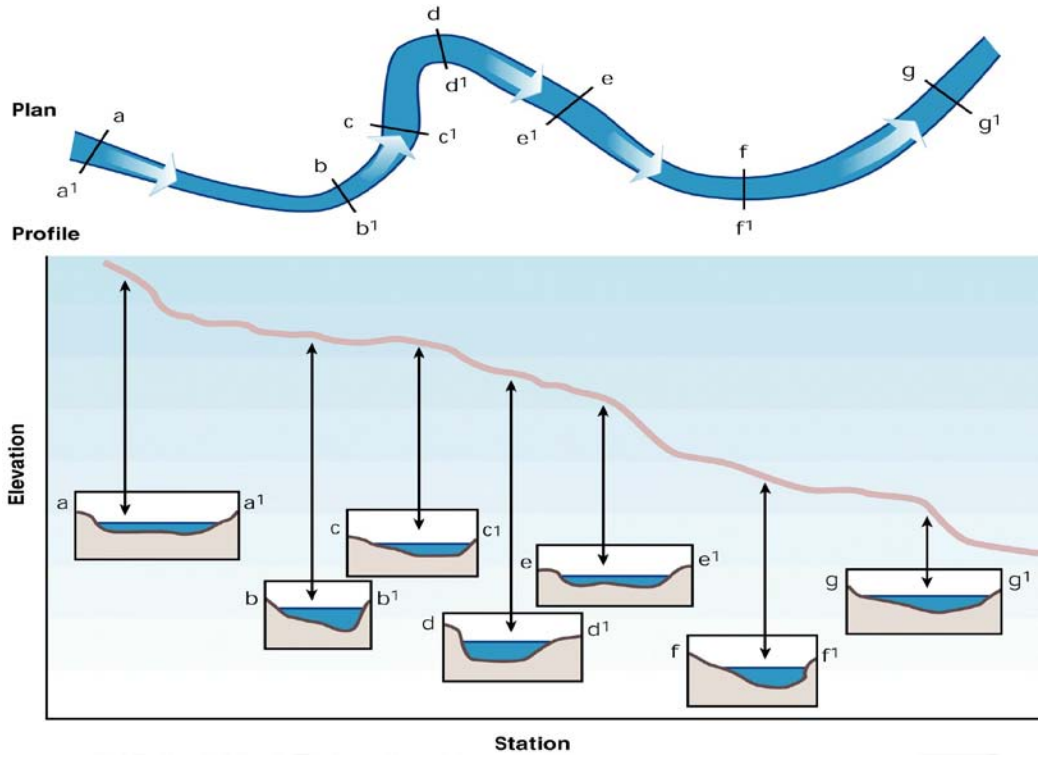

Figure 5. Application of a water-surface-profile model requires both a longitudinal channel profile and several surveyed cross sections (Federal Interagency Stream Restoration Working Group 1998).

Of the methods presented for determining elevation of floods for pipelines crossing channels, the detailed method is the most accurate and should be used for situations with high resource values, infrastructure investment, construction costs, or liabilities in downstream areas. In undeveloped areas, the physiographic and analytical methods may be used to provide quick estimates of flood elevations for sites with fewer downstream concerns. The reconnaissance method provides the roughest estimates but may be all that is warranted in very unstable areas, such as alluvial fans or low relief valley floors (e.g., near playas). The detailed, analytical, and physiographic methods all assume relatively stable channel boundaries but may be used on sand channels with an accompanying loss of accuracy. In very sandy channels, the accuracy of results from the detailed method may not be significantly better than the results from one of the intermediate methods unless a mobile-boundary model is used (Burkham 1988).

SUBSURFACE (BURIED) CROSSINGS

Since many of the pipelines are small and most of the channels are ephemeral, it is commonplace to bury the pipelines rather than suspending them above the streams. The practice of burying pipelines at channel crossings likely is both cheaper and easier than suspending them above all floodflows; however, an analysis of channel degradation and scour should be completed to ensure the pipelines are not exposed and broken during extreme runoff events (Figure 6). Without such an analysis, channels should be excavated to bedrock and pipelines placed beneath all alluvial material.

Figure 6. Channel degradation or scour during flash-flood events may expose buried pipelines, resulting in costly breaks.

Buried pipelines may be exposed by streambed lowering resulting from channel degradation, channel scour, or a combination of the two. Channel degradation occurs over a long stream reach or even the entire drainage network and is generally associated with the overall lowering of the landscape. Degradation also may be associated with changes in upstream watershed or channel conditions that alter the water and sediment yield of the basin. Channel scour is a local phenomenon associated with passage of one or more flood events or site-specific hydraulic conditions that may be natural or human-caused in origin. Either process can expose buried pipelines to excessive forces associated with extreme flow events, and an analysis of each is required to ensure integrity of the crossing.

CHANNEL DEGRADATION

Detection of long-term channel degradation must be attempted, even if there is no indication of local scour. Conceptual models of channel evolution (e.g., Simon 1989) have been proposed to describe a more-or-less predictable sequence of channel changes that a stream undergoes in response to disturbance in the channel or the watershed. Many of these models are based on a "space for time" substitution, whereby downstream conditions are interpreted as preceding (in time) the immediate location of interest, and upstream conditions are interpreted as following (in time) the immediate location of interest. Thus, a reach in the middle of the watershed that previously looked like the channel upstream will evolve to look like the channel downstream

(Federal Interagency Stream Restoration Working Group 1998). Since channel evolution models can help predict current trends where a pipeline crosses a channel, they may indicate areas to be avoided when relocation of the crossing is an option. Most conceptual models of channel evolution have been developed for landscapes dominated by streams with cohesive banks; however, the same processes occur in streams with noncohesive banks, with somewhat less well-defined stages.

Geomorphic indicators of recent channel incision (e.g., obligate and facultative riparian species on present-day stream terraces elevated above the water table) also may be helpful for diagnosing channel conditions. However, long-term trends in channel evolution are often reversed during major flood events, especially for intermittent and ephemeral channels in arid and semiarid environments. Thus, a stream that is degrading during annual and intermediate flood events may be filled with sediment (i.e., it may aggrade) from tributary inputs during a major flood, and channels that are associated with sediment storage (i.e., aggrading) during the majority of runoff events may be "blown out" with major degradation during unusual and extreme large floods.

In some situations, a quantitative analysis of channel degradation may be warranted. Plots of streambed elevation against time permit evaluation of bed-level adjustment and indicate whether a major phase of channel incision has passed or is ongoing. However, comparative channel survey data are rarely available for the proposed location for a pipeline to cross a channel. In instances where a gaging station is operated at or near the crossing, it is usually possible to determine long-term aggradation or degradation by plotting the change in stage through time for one or more selected discharges. The procedure is called a specific-gage analysis (Figure 7) and is described in detail in *Stream Corridor Restoration: Principles, Processes, and Practices* (Federal Interagency Stream Restoration Working Group 1998). When there is no gaging station near the proposed channel crossing, nearby locations on the same stream or in the same river basin may provide a regional perspective on long-term channel adjustments. However, specific-gage records indicate only the conditions in the vicinity of the particular gaging station and do not necessarily reflect river response farther upstream or downstream of the gage. Therefore, it is advisable to investigate other data in order to make predictions about potential channel degradation at a site.

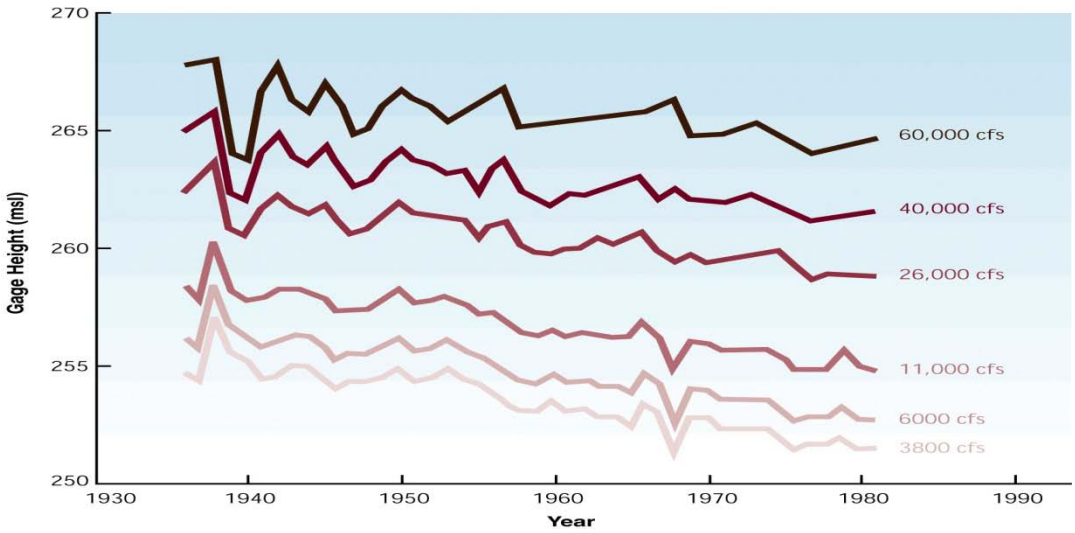

Figure 7. Specific-gage plots of the gage heights associated with index flows through time may indicate general channel lowering in the drainage basin (Federal Interagency Stream Restoration Working Group 1998; Biedenharn et al. 1997).

Other sources of information include the biannual bridge inspection reports required in all States for bridge maintenance. In most States, these reports include channel cross sections or bed elevations under the bridge, and a procedure similar to specific gage analysis may be attempted (Figure 8). Simon (1989, 1992) presents mathematical functions for describing bed-level adjustments through time, fitting elevation data at a site to either a power function or an exponential function of time. Successive cross sections from a series of bridges in a basin also may be used to construct a longitudinal profile of the channel network; sequential profiles so constructed may be used to document channel adjustments through time (Figure 9). Again, bridge inspection reports so used indicate only the conditions in the vicinity of those particular bridges (where local scour may be present) and must be interpreted judiciously for sites upstream, downstream, or between the bridges used in the analysis.

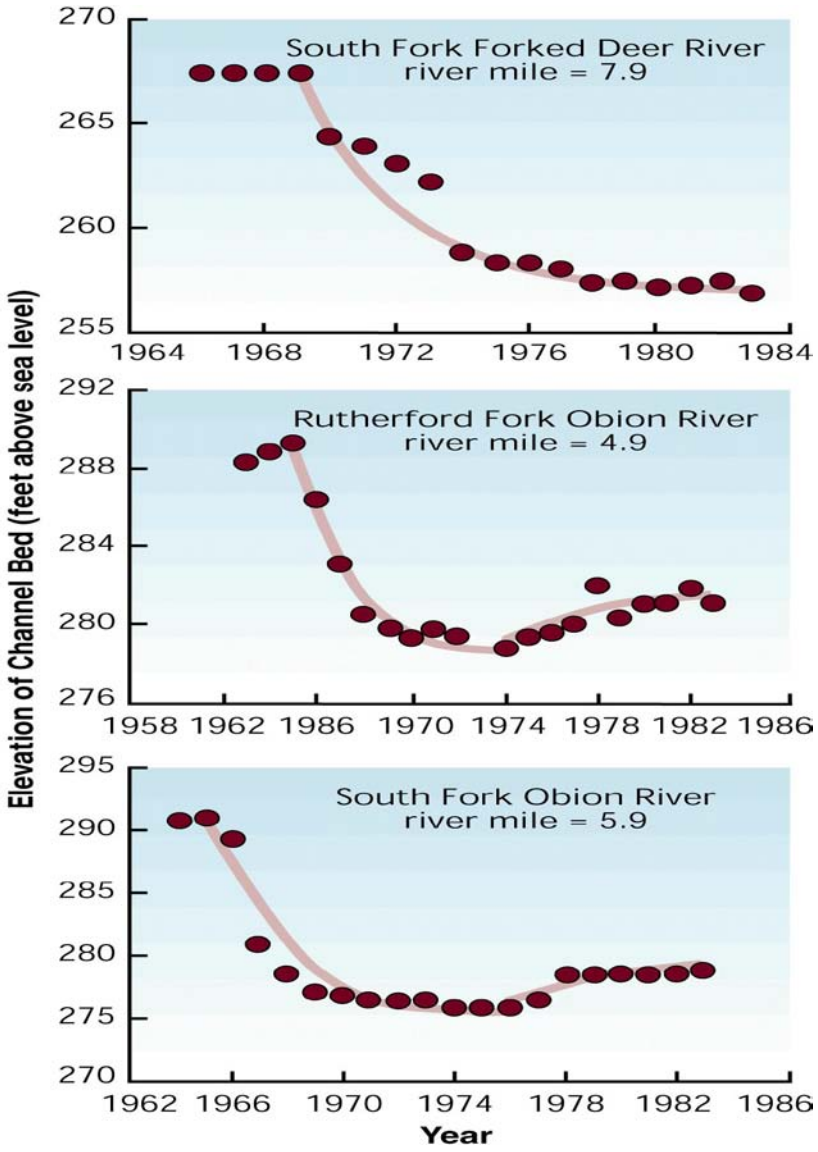

Figure 8. Plots of bed elevation versus time may be developed from biannual bridge inspection reports to document systemwide degradation or aggradation (Federal Interagency Stream Restoration Working Group 1998).

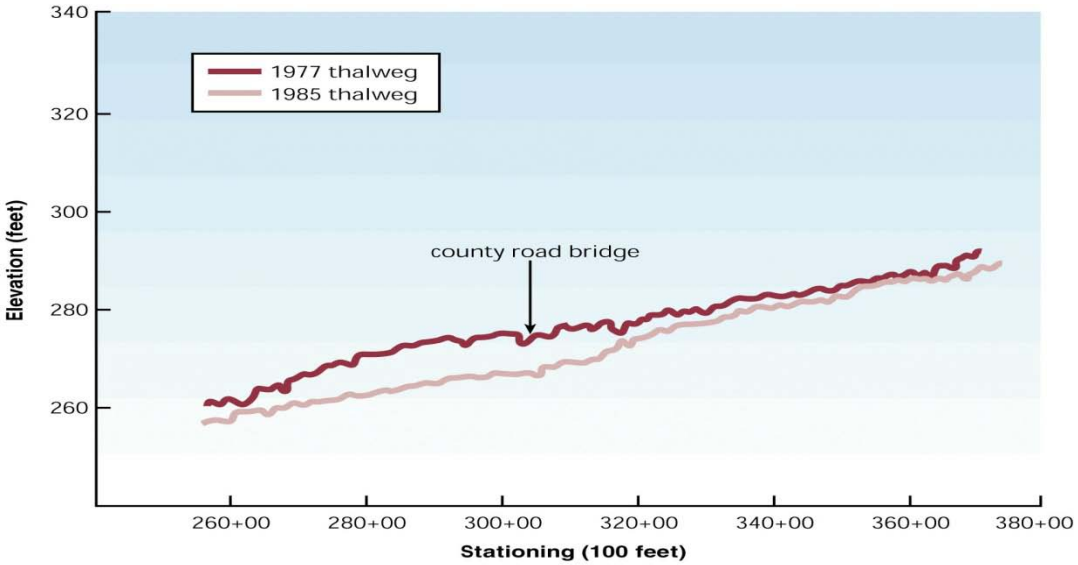

Figure 9. Sequential longitudinal profiles also may be used to document channel lowering through time (Federal Interagency Stream Restoration Working Group 1988; Biedenharn et al. 1997).

In the absence of channel surveys, gaging stations, and bridge inspection reports (or other records of structural repairs along a channel), it may be necessary to investigate channel aggradation and degradation using quantitative techniques described in Richardson et al. (2001) and Lagasse et al. (2001). Techniques for assessing vertical stability of the channel include incipient motion analysis, analysis of armoring potential, equilibrium slope analysis, and sediment continuity analysis. Incipient motion analysis and analysis of armoring potential are equally applicable to both long-term degradation and short-term scour and fill processes, while equilibrium-slope and sediment-continuity analyses are more closely tied to long-term channel processes (i.e., degradation and aggradation).

CHANNEL SCOUR

In addition to long-term channel degradation at subsurface crossings, general channel scour must be addressed to ensure safety of the pipeline. General scour is different from long-term degradation in that general scour may be cyclic or related to the passing of a flood (Richardson and Davis 2001). Channel scour and fill processes occur naturally along a given channel, and both reflect the redistribution of sediment and short-term adjustments that enable the channel to maintain a quasi-equilibrium form. In other words, channels in dynamic equilibrium experience various depths of scour during the rising stages of a flood that frequently correspond to equal amounts of fill during the falling stages, resulting in minimal changes in channel-bed elevation. Where pipelines cross channels, it is important to determine the potential maximum depth of scour so that the pipeline is buried to a sufficient depth and does not become exposed when bed scour occurs during a flood.

General scour occurs when sediment transport through a stream reach is greater than the sediment load being supplied from upstream and is usually associated with changes in the channel cross section. General scour can occur in natural channels wherever a pipeline crosses a constriction in the channel cross section (contraction scour). Equations for calculating

contraction scour generally fall into two categories, depending on the inflow of bed-material sediment from upstream. In situations where there is little to no bed-material transport from upstream (generally coarse-bed streams with gravel and larger bed materials), contraction scour should be estimated using clear-water scour equations. In situations where there is considerable bed-material transport into the constricted section (i.e., for most sand-bed streams), contraction scour should be estimated using live-bed scour equations. Live-bed and clear-water scour equations can be found in many hydraulic references (e.g., Richardson and Davis 2001). In either case, estimates of general scour in the vicinity of the pipeline crossing must be added to the assessment of channel degradation for estimating the depth of burial for the crossing.

Other components of general scour can result from placement of subsurface crossings relative to the alignment of the stream channel. Pipelines crossing at bends in the channel are particularly troublesome, since bends are naturally unstable and tend to collect both ice and debris (which can cause additional constrictions in the flow). Channel-bottom elevations are usually lower on the outside of meander bends and may be more than twice as deep as the average depth in straighter portions of the channel. Crossings in the vicinity of stream confluences also create difficulties, since flood stages and hydraulic forces may be strongly influenced by backwater conditions at the downstream confluence. For example, sediment deposits from tributary inputs may induce contraction scour opposite or downstream of the deposit. Additional complications are introduced where pipelines are located near other obstructions in the channel. Channel-spanning obstructions (e.g., beaver dams or large wood) may induce plunge-pool scour downstream of the structure, and individual obstructions in the channel induce local scour akin to pier scour characteristic of bridge piers at highway crossings.

Even in the absence of contraction scour, general scour will still occur in most sand-bed channels during the passage of major floods. Since sand is easily eroded and transported, interaction between the flow of water and the sand bed results in different configurations of the stream bed with varying conditions of flow. The average height of dune bedforms is roughly one-third to one-half the mean flow depth, and the maximum height of dunes may nearly equal the mean flow depth. Thus, if the mean depth of flow in a channel was 5 feet, maximum dune height could also approach 5 feet, half of which would be below the mean elevation of the stream bed (Lagasse et al. 2001). Similarly, Simons, Li, and Associates (1982) present equations for antidune height as a function of mean velocity, but limit maximum antidune height to mean flow depth. Consequently, formation of antidunes during high flows not only increases mean water-surface elevation by one-half the wave height, it also reduces the mean bed elevation by one-half the wave height. Richardson and Davis (2001) reported maximum general scour of one to two times the average flow depth where two channels come together in a braided stream.

Pipeline crossings that are buried rather than suspended above all major flow events should address all of the components of degradation, scour, and channel-lowering due to bedforms described above. In addition, once a determination is made on how deep to bury the pipeline at the stream crossing, the elevation of the pipe should be held constant across the floodplain. If the line is placed at shallower depths beneath the floodplain, channel migration may expose the line where it is not designed to pass beneath the channel (Figure 10).

Figure 10. Lateral migration of this stream channel during high water excavated a section of pipeline under the floodplain that was several feet shallower than at the original stream crossing.

In complex situations or where consequences of pipeline failure are significant, consideration should be given to modeling the mobile-bed hydraulics with a numerical model such as HEC-6 (U.S. Army Corps of Engineers 1993) or BRI-STARS (Molinas 1990). The Federal Interagency Stream Restoration Working Group (1998) summarizes the capabilities of these and other models and provides references for model operation and user guides where available.

CONCLUSION

Pipelines that cross perennial, intermittent, and ephemeral stream channels should be constructed to withstand floods of extreme magnitude to prevent rupture and accidental contamination of runoff during high flow events. Pipelines crossing at the surface must be constructed high enough to remain above the highest possible floodflows at each crossing, and pipelines crossing below the surface must be buried deep enough to remain undisturbed by scour and fill processes typically associated with passage of peak flows. A hydraulic analysis should be completed during the pipeline design phase to avoid repeated maintenance of such crossings and eliminate costly repairs and potential environmental degradation associated with pipeline breaks at stream crossings.

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APPENDIX P.

WILD AND SCENIC RIVERS STUDY PROCESS

P.1 INTRODUCTION

The Wild and Scenic Rivers Act, P.L. 90-542, became law on October 2, 1968. It preserves "certain selected rivers" that "possess outstandingly remarkable scenic, recreational, geologic, fish, wildlife, historic, cultural, or other similar values… in their free-flowing condition… for the benefit and enjoyment of present and future generations." Eight rivers or river segments were included as initial components in the National Wild and Scenic Rivers System (National System). Congress and /or the Secretary of the Interior have added 155 rivers or river segments to the National System since then.

Section 5(d)(1) of the Wild and Scenic Rivers Act directs federal agencies to consider the potential for national wild, scenic, and recreational river areas in all planning for the use and development of water and related resources. This review is being conducted as part of the Resource Management Plan (RMP) preparation in the Moab Field Office.

The following documents were utilized in guiding the WSR planning process through the Eligibility/Tentative Classification phase:

- **Interagency Wild and Scenic Rivers Coordination Council**. 1982. Contains various technical papers relating to evaluation of Wild and Scenic Rivers. (See website at: www.nps.gov/rivers/publications.html)
- **Interagency Agreement.** On December 13, 1994, the Bureau of Land Management (Utah State Office), the USDA Forest Service (Intermountain Region), and the National Park Service (Rocky Mountain Region) signed an Interagency Agreement. The agreement calls for the three agencies to work cooperatively to define common criteria and processes for use in determining the eligibility and suitability of Utah Rivers for potential inclusion by Congress in the National Wild and Scenic Rivers System. As a result of this agreement, guidance was developed to provide a uniform methodology to be used by the three agencies to obtain consistent results in the wild and scenic eligibility assessments made during planning efforts in the state of Utah. The guidance is titled *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use* (This document is known as the "Blue Book", due to its blue cover).
- **Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use**. July 1996.
- **Wild and Scenic Rivers Act, P.L. 90-542, as amended**. Congressional legislative direction for Wild and Scenic River planning.
- **Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, and Management, Bureau of Land Management Manual – 8351.** 1992 and changes as of 1993. Establishes BLM policy, program direction, and procedural standards for fulfilling requirements of the Wild and Scenic Rivers Act.

P.2 HISTORY OF WILD AND SCENIC RIVER PROCESS – MOAB FIELD OFFICE AREA

P.L. 90-542 also authorized 27 rivers for study as potential components of the National System. Amendments to the law have brought the total number of studies authorized to 138. One of the studies included the Colorado River segment, from its confluence with the Dolores River, Utah, upstream to a point 19.5 miles from the Utah-Colorado border in Colorado. The Utah portion of the "Study River" falls within the Moab Field Office Area. On December 17, 1976, the Dolores River from its confluence with the Colorado River upstream to Gateway, Colorado was added to the study. This was at the request of Governor Rampton of Utah and Governor Lamm of Colorado, and agreed to by the Secretary of the Interior. The Utah portion of the Dolores River also falls within the Moab Field Office area. The study concluded that the river areas contained outstandingly remarkable scenic, geologic, recreational, and wildlife values. Various segments of the rivers were classified as qualifying for wild, scenic, and recreational designation.

In 1979, the State of Utah conducted an inventory and analysis of the portions of the "Study Rivers" within its boundaries, and deferred making its recommendations regarding designation to the study team. The State of Colorado supported designation of the rivers within its borders. The Bureau of Outdoor Recreation/NPS submitted the 1979 study findings to the Department of Interior. Secretary Watt sent a negative recommendation to President Reagan based upon the cost of scenic easement acquisition and lack of public support for designation, and in 1985, President Reagan sent a negative recommendation for all river segments considered by the study to Congress.

Congressman Howard Nielson of Utah hosted a fact-finding trip in 1987 through Westwater Canyon on the Colorado River. Letters supporting the designation of Westwater Canyon into the National System were submitted to Congressman Nielson by the Western River Guides Association, the Utah Guides and Outfitters, the BLM Multiple-use Advisory Council, the Grand County Travel Council, the Utah Travel Council, the Grand County Commission, the City of Moab, and the Moab Chamber of Commerce. In 1988, The Department of Interior withdrew 4,707.44 acres within Westwater Canyon from surface entry and mining for a period of 5 years to protect recreational, scenic and cultural values. This withdrawal covered the main portion of Westwater Canyon.

That same year, Congress authorized funding under the Land and Water Conservation Act for acquisition of additional land adjacent to the Westwater Ranger Station and for acquisition of land at the Cisco Take-out to provide for public access. However, the Grand County Commission withdrew its support for designation of Westwater Canyon and Governor Bangerter (in a letter to the Grand County Travel Council) deferred taking a position on the designation of Westwater Canyon into the National System until there was local agreement on the issue.

In 1989, The Grand County Commission requested members of the Utah Congressional delegation to designate the 12 miles of the Colorado River within Westwater Canyon into the National System as a Wild River. The Commission letter of support stated that: "There is no doubt that this section of the river more than satisfies the necessary characteristics of this designation and we all feel that you should proceed with all haste."

Congressman Nielson and Senator Garn introduced legislation in 1990 to designate 12 miles of the Colorado River within Westwater Canyon as a Wild River. The bills passed both houses near the end of the 101st Congress with the Senate bill including an additional unrelated provision

about minerals on public lands. However, as the Senate bill passed only 4 days before the end of the Congress, it was not possible to schedule a conference committee meeting and the legislation died. Congressman Nielson retired at the end of the 101st Congress.

In 1995, The Department of Interior withdrew the above-mentioned 4,707.44 acres within Westwater Canyon from surface entry and mining for 50 years, and in 1998, withdrew an additional 3,385.9 acres covering side drainages in Westwater Canyon from surface entry and mining for 20 years.

P. 3 ELIGIBILITY AND TENTATIVE CLASSIFICATIONS

P.3.1 SUMMARY OF THE REVIEW PROCESS

A team of specialists from the Moab Field Office, listed below in Table P.1, began the Wild and Scenic review process in August of 2002. Team members agreed to use the *Ecological Subregions* (USFS ECOMAP, 1993; as adapted from Ecoregions of the United States, R.G. Bailey, 1994). The data was organized according to 4th level of Hydrologic Unit Codes (HUC). In order to assure that all potentially eligible rivers were considered, all streams found on 1:100,000 scale maps were reviewed (see Moab Proposed RMP/FEIS, Appendix J for entire list of streams). The rivers from the 1979 study (Colorado and Lower Dolores Rivers) were looked at again in the planning process. Team members used the *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use,* (July 1996), to guide them through the eligibility process.

Table P.1. Moab Field Office Interdisciplinary Team Members

Name	Title	Team Responsibility
Marilyn Peterson	Outdoor Recreation Planner	Team Coordinator
Katie Stevens	Outdoor Recreation Planner	Scenery, Recreation, Fish, Wildlife
Bill Stevens	Outdoor Recreation Planner	Scenery, Recreation
Rob Sweeten	Landscape Architect	Scenery
Denice Swanke	Physical Scientist	Geology
Stephanie Ellingham	Natural Resource Specialist	Ecology, riparian
Ann Marie Aubry	Hydrologist	Hydrology, riparian
Donna Turnipseed	Archaeologist	Historic, Cultural
Daryl Trotter	Environmental Protection Spec.	Native Plants, and Ecology
Brent Northrup	Resource Advisor, Lands/Minerals	Planning Coordinator
Russ von Koch	Branch Chief, Recreation	Recreation
Pam Riddle	Biologist	Fish , Wildlife
Raymon Carling	Natural Resource Specialist	Knowledge of Resource Area

Streams were grouped by drainage within each HUC, and evaluated to see if they were free-flowing or not. The next step was to analyze free-flowing drainages for significant river-related resource values or features. These values were compared with values present in similar streams within the Ecological Subregion/sections. Streams or portions of streams with the most

significant values, and those with multiple significant values rated the highest for "outstandingly remarkable values" (ORVs). Free-flowing streams with ORVs were given a tentative classification based on the criteria from the *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use.* These criteria are included in Section P.3.2.4 of this document.

P 3.2 STEPS IN THE ELIGIBILITY REVIEW PROCESS

P.3.2.1 IDENTIFICATION OF POTENTIALLY ELIGIBLE RIVERS

Rivers to consider were identified from the following sources:

- Nationwide Rivers Inventory (NRI) list, NPS 1995, (Utah modified Oct. 5, 2001)
- American Rivers Outstanding List, May 1991
- American Whitewater Affiliation Nationwide Whitewater Inventory
- 1970 USDA/USDI list, and 1972 list
- A Citizen's Proposal to Protect the Wild Rivers of Utah, 1997
- Those identified in public scoping during RMP process
- Those identified by Federal Agencies, State of Utah, Indian Tribes, local governments, and professional specialists within the BLM Moab Field Office.

The Moab ID Team reviewed all streams found on 1:100,000 maps. A list of the major drainages reviewed is found in Appendix J of the Proposed RMP/FEIS..

P.3.2.2 CONSIDERATION OF FREE-FLOWING CHARACTER

All rivers in the Moab Field Office area are free-flowing. Free-flowing is defined [in the Wild and Scenic Rivers Act Section 16(b)] "as applied to any river of section of a river, means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion: *Provided*, That this shall not be construed to authorize, intend, or encourage future construction of such structures within the components of the national wild and scenic rivers system."

P.3.2.3 IDENTIFICATION OF OUTSTANDINGLY REMARKABLE VALUES (ORVS)

For a river to be eligible for inclusion in the National System it must possess one or more Outstandingly Remarkable Values (ORVs). To be determined outstandingly remarkable, resources should be river-related and at least regional in significance. Rare, unique, or exemplary river-related resources are considered. Criteria to use are discussed in the *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use*, and can be summarized as follows:

- **Scenery**: Diversity of view, Special Features, Seasonal Variations, Cultural Modifications
- **Fish:** Habitat Quality, Diversity of Species, Value of Species, Abundance of fish, Natural Reproduction, Size and Vigor of Fish, Cultural/Historic Importance, Recreational Importance, Access

- **Recreation-Water Oriented**: Length of Season, Diversity of Use, Flow, Character of Run, Scenery/Naturalness, Access, Level of Use, Associated Opportunities, and Attraction.
- **Recreation-General:** Length of Season, Diversity of Use, Experience Quality, Scenery/Naturalness, Access, Level of Use, Associated Opportunities, Attraction, Sites and Facilities
- **Wildlife:** Habitat Quality, Diversity of Species, Abundance of Species, Natural Reproduction, Size and Vigor of Species, Cultural/Historic Importance, Recreational Importance, Access
- **Geologic:** Feature Abundance, Diversity of Features, Educational/Scientific
- **Historic:** Significance, Site Integrity, Educational/Interpretation, Listing/Eligibility
- **Cultural:** Significance, Current Uses, Number of Cultures, Site Integrity, Education/ Interpretation, Listing/ Eligibility
- **Ecological:** Species Diversity, Ecological Function, Rare Communities, Education/Scientific

Each resource was compared by the interdisciplinary team to other such resources within the region of comparison, using the criteria identified in the *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use*, and considering the exemplary, rare or unique qualities of each resource, in order to determine regional (or national) significance. Those river segments deemed to have insufficient value were dropped from further consideration.

Ecological Subregions (USFS ECOMAP 1993; as adapted from *Ecoregions of the United States*, R.G. Bailey 1994) are subregions of the physiographic provinces, and were identified as generally well-suited for use as Region(s) of Comparison in Utah (Utah BLM and Forest Service concurrence, May 2002)**,** and were used as the framework for the Moab eligibility review.

According to this classification**,** *Ecological Sections* define broad areas of similar ecological systems based on regional climate, geomorphology, geology, and drainage networks. These *Ecological Sections* were selected as the reference unit for wild and scenic river evaluations because they provide visible breaks on the landscape and a context for relative consistency in regional comparison of scenic and other resource values. The overall region of comparison used by the Moab Field Office is comprised of the fifteen *Ecological Sections* listed below.

Ecological Section: (Subregion 36:Colorado Semi-Desert)
- Grand Canyon (313A)
- Navajo Canyonlands (313B)
- Painted Desert (313D)

Ecological Section: (Subregion 38: Arizona-New Mexico Mountains Semi-Desert-Open Woodland-Coniferous Forest-Alpine Meadow)
- White Mountain – San Francisco Peaks-Mogollon Rim (M313A)

Ecological Section: (Subregion 43: Southern Rocky Mtn Steppe-Open Woodland Coniferous Forest Alpine Meadow)
- Overthrust Mountains (M331D)
- Uinta Mountains (M332E)
- South Central Highlands (M331G)
- Northern Central Highland and Rock Mtns (M331H)

Ecological Section: (Subregion 47: Intermountain Semi-Desert and Desert)
- Bonneville Basin (341A)
- Northern Canyon Lands (341B)
- Uinta Basin (341C)

Ecological Section: (Subregion 48: Intermountain Semi-Desert)
- Bear Lake (342E)
- Green River Basin (342G)

Ecological Section: (Subregion 49: Nevada-Utah Mountains Semi-Desert- Coniferous Forest–Alpine Meadow)
- Tavaputs Plateau (M341B)
- Utah High Plateaus Mountains (M341C)

The Interdisciplinary (ID) Team subject matter specialists evaluated the ORVs for each of the 248 river segments. The evaluations for all eligible river segments may be found in Appendix J of the Proposed RMP/FEIS. Those evaluations for those rivers found suitable in the Approved RMP are found in Attachment 1 to this appendix.

The ID Team found the remaining 225 river segments to not have outstandingly remarkable river-related values when values were compared regionally or nationally.

P.3.2.4 TENTATIVE CLASSIFICATION

A "Tentative Classification" of Wild, Scenic, or Recreational was determined for all eligible rivers/segments. Tentative classifications are based on the type and degree of human development associated with the river and adjacent land, as they exist at the time of the evaluation. The four key elements are:

1. Water Resources Development
2. Shoreline Development
3. Accessibility
4. Water Quality

Eligible rivers are classified Wild, Scenic, or Recreational based on man's activities. The following sections provide additional information about the character of wild, scenic and recreational river areas.

P.3.2.4.1 WILD RIVER AREAS

Wild River Areas are defined by the WSRA to include: "Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watershed or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America."

Management of wild river areas give primary emphasis to protecting the values that make it outstandingly remarkable while providing river-related outdoor recreation opportunities in a primitive setting.

P.3.2.4.2 SCENIC RIVER AREAS

Scenic river areas are defined by the WSRA to include: "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

Management of scenic river areas should maintain and provide outdoor recreation opportunities in a near-natural setting. The basic distinctions between a "wild" and a "scenic" river area are the degree of development, types of land use, and road accessibility. In general, a wide range of agricultural, water management, silvicultural, and other practices or structures could be compatible with scenic river values, providing such practices or structures are carried on in such a way that there is not substantial adverse effect the river and its immediate environment. .

P.3.2.4.3 RECREATIONAL RIVER AREAS

Recreational river areas are defined by the WSRA to include: "Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past."

Management of recreational river areas gives primary emphasis to protecting the values that make it outstandingly remarkable while providing river-related outdoor recreation opportunities in a recreational setting.

Recreational classification is a determination of the level of development and does not prescribe or assume recreation development or enhancement. Management of recreational river areas can and should maintain and provide outdoor recreation opportunities. The basic distinctions between a "scenic" and a "recreational" river area are the degree of access, extent of shoreline development, historical impoundment or diversion, and types of land use. In general a variety of agricultural, water management, silvicultural, recreational, and other practices or structures are compatible with recreational river values, providing such practices or structure are carried on in such a way that there is not substantial adverse effect on the river and its immediate environment.

Criteria for the classification of river areas as wild, scenic and recreational are summarized in Table P.2.

Table P.2 Classification Criteria for Wild, Scenic, and Recreational River Areas

Attribute	Wild	Scenic	Recreational
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	Meets or exceeds federal criteria for federally approved state standards for aesthetics, for propagation of fish and wildlife normally adapted to the habitat of the river, and for primary contact recreation (swimming), except where exceeded by natural conditions.	No criteria prescribed by the Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable federal and state laws.	

P.3.2.5 Coordination with Local Governments, Agencies, Tribes, Organizations, and the Public

In keeping with the coordinating MOU, a wild and scenic river presentation was made by the governor's representative to the Grand County Council and the San Juan County Commission on September 27, 2002 in conjunction with the Manti-La Sal National Forest WSR eligibility process. The San Juan County Public Lands Council held a meeting at the San Juan County Courthouse on August 20, 2003. At that meeting, BLM Moab presented preliminary eligibility findings on segments in the Moab Field Office within San Juan County. The Grand County Council held a meeting on September 10, 2003. At that meeting, the BLM Moab presented preliminary eligibility findings on segments within Grand County to the Council.

Preliminary eligibility findings for the Moab Field Office were made available for public review and comment in September 2003. State and local governments, Native American Tribes, organizations, cooperating federal agencies, and members of the public were asked to review the preliminary findings, provide comments related to the findings, and to identify any potentially eligible rivers or information that had been overlooked.

All comments received were carefully reviewed. Documentation of the BLM response to comments is on file at the BLM Moab Field Office.

On February 23, 2004 a team meeting was held to make final determination on eligibility in light of the review comments that were received. Representatives from the State of Utah, Grand and San Juan Counties participated in the meeting.

P.4 Suitability Study

The 29 eligible segments were further reviewed as to their suitability for congressional designation into the National System. This was done within the framework of the ongoing planning process for the Moab Resource Management Plan (RMP), including the development of an Environmental Impact Statement. A complete summary of the Suitability Study is found in the Moab Proposed Resource Management Plan/Final EIS in Appendix J.

The purpose of the suitability step of the study process is to determine whether eligible rivers would be appropriate additions to the national system by considering tradeoffs between corridor development and river protection. Suitability considerations include the environment and economic consequences of designation and the manageability of a river if it were designated by Congress.

The Wild and Scenic River Suitability evaluation is designed to answer the following questions:

- Should the river's free-flowing character, water quality, and outstandingly remarkable values (ORVs) be protected? OR, are one or more other uses important enough to warrant doing otherwise?
- Will the river's free-flowing character, water quality, and ORVs be protected through designation? And, is wild and scenic river designation the best method for protecting the river corridor and its values?

In answering these questions, the benefits and impacts of WSR designation must be evaluated, and alternative protection methods considered.

The environmental impact statement for the resource management plan evaluates impacts that would result if the eligible rivers were determined suitable and managed to protect their free-flowing nature, tentative classification, and outstandingly remarkable values. It also addresses impacts that would result if the eligible rivers are not determined suitable and their values are not provided protective management.

Alternative tentative classifications are also evaluated. "Whenever an eligible river segment has been tentatively classified, e.g., as wild, other appropriate alternatives may provide for designation at another classification level (scenic or recreational). There is not another classification alternative for rivers tentatively classified as recreational. As long as a river segment is under study, it must be afforded protection at the tentative classification level it was given when determined eligible, even if another classification is considered as an alternative in the RMP" (BLM Manual 8351.33). For river segments determined nonsuitable in the RMP, the river shall be managed in accordance with the management objectives as outlined in the RMP.

In addition to the impact analysis addressed by alternative, the following suitability considerations were applied to each eligible river.

Characteristics which do or do not make the area a worthy addition to the national system:

- Status of land ownership and use in the area
- Uses, including reasonably foreseeable potential uses, of the area and related waters, which would be enhanced, foreclosed, or curtailed if the area were included in the national system of rivers; and the values which could be foreclosed or diminished if the area is not protected as part of the national system.
- Interest by federal, tribal, state, local, and other public entities in designation or non-designation of a river, including the extent to which the administration of the river, including the costs thereof, can be shared by the above mentioned entities.
- Ability of the agency to manage and protect the values of a river if it were designated, and other mechanisms to protect identified values other than Wild and Scenic Rivers designation.
- The estimated cost, if necessary, of acquiring lands, interests in lands, and administering the area if it were included in the national system.
- The extent to which administration costs will be shared by local and state governments.

The following table lists the interdisciplinary meeting held during the suitability step of this study process.

Table P.3 Suitability Study Interagency Meeting

Date	Attending	
August 30, 2004	Evan Lowry, San Juan County Will Stokes, School Trust Lands Val Payne, State of Utah Bill Stevens, Recreation Maggie Wyatt, Moab Field Office Mgr.	Marilyn Peterson, Recreation Katie Stevens, Recreation Stephanie Ellingham, Riparian Dave Vaughn, Grand County

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
COLORADO RIVER SEGMENT (2) **River mile 125 (Westwater Canyon) to river mile 112** **Classification**: Wild **BLM Free-flowing River Miles:** 11.8 **Reason for Free-flowing Determination:** Natural Flow	**Scenery** Westwater Canyon is the most scenic, dramatic, and untouched portion of the Colorado River within the entire Colorado Plateau, making scenery an outstanding remarkable value of regional and national significance. The extremely hard rock through which the river flows has a number of effects. It narrows the upper stretch of the river, which is only about 35 feet wide in places. The resulting rapids contribute to Westwater Canyon's international reputation. This constriction has led to a variety of different polished and fluted rock formations up to the high water line. Above that, the rock is angular and interpenetrated by light colored dikes. It has been cut to a depth of about 200 feet in the vicinity of Marble and Star Canyons, creating an extremely narrow, claustrophobic gorge that lies within an outer gorge of flaring red sandstone walls stained with long black streamers of desert varnish. In places these upper walls have been covered by mudflows from the infrequent rains, leaving a braided pattern. Near Skull Rapid the characteristic impression of Westwater Canyon is strongest. Such is the roar of the river in the time of high water that conversation must be carried on by shouting. The red rocks, hundreds of feet above the river contrast dramatically with the black rocks of its inner gorge. There is almost no shore but for occasional spills of massive talus boulders. In contrast to the rapids on other large western rivers, those of Westwater have curious fountains, boils, and whirlpools caused by the narrowness, depth, and wall projection. At its lower end, the river is again lined by Wingate Sandstone, Entrada, and then by the slopes and scattered spall of the Morrison Formation. The landform of this segment is exceptional and full of detail and variety. The reduction of vegetation is a stark contrast to other segments of the river. The water is the most dominant feature in the landscape. The color is dominated by the black rock in the canyon and its intensity and polished nature are distinctive. This is definitely a unique and memorable view. **Recreation** Recreation is regionally significant. A trip through Westwater Canyon of the Colorado River is a premier one or two-day whitewater boating experience in a Wilderness Study Area. Other recreational opportunities provided on this stretch of river include viewing unique and beautiful scenery, hiking side canyons (especially the Little Dolores hike to the waterfall), and wilderness camping. Self-outfitted users must obtain a permit, and a limited number of boaters are allowed to launch each day. Eighteen commercial outfitters market trips both nationally and internationally. This stretch is boatable by most types of whitewater craft year round. Limited access adds to the primitive character of this stretch of river, enhancing its recreational and economic values. Westwater Canyon is one of the premier recreation experiences available within the Colorado Plateau and is marketed as such. **Wildlife** Only along the Colorado River is there such a rich variety of habitat for many types of wildlife species including, avian, terrestrial and aquatic. It

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	is important habitat for ungulates such as mule deer and elk. This reach of the Colorado River Corridor offers habitat for the Mexican spotted owl and Southwestern willow flycatcher, both federally listed on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. Many types of raptors, including peregrine falcons, ferruginous hawks, wintering bald eagles, and golden eagles, utilize the riverine corridor. Shorebirds and songbirds depend on the river, and it is important to neotropical migrants. Northern river otter also depend on the river. The importance of the Colorado River habitat to animals of many species cannot be overestimated. In addition to the above mentioned fowl, snowy egrets are a common sight in the fall and turkey vultures in the spring. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water availability and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. The Colorado River is a regionally significant resource to many wildlife species. This reach of the Colorado River is adjacent to 2 of only 4 known nesting sites for the Bald Eagle (*Haliaeetus leucocephalus*) within the entire State of Utah. (Two of these four nests are in segments one and three of the Colorado River Corridor.) The proximity of this river segment to both of these nests makes this reach an important hunting territory for the eagles. Nesting bald eagles are a rare occurrence in the State of Utah and are afforded federal protection under the Bald Eagle Act. Nesting bald eagles are reliant on riparian corridors to nest and raise their young, making these nesting sites river related. This reach of the river is regionally and nationally significant, as a rare and unique occurrence of this federally protected bird can be found. **Fish** The Colorado River is the home of four endangered fish species, the Colorado Pikeminnow, the Razorback Sucker, the Humpback Chub, and the Bonytail Chub. It is spawning ground for both the Colorado Pikeminnow and the Humpback Chub. It is considered Critical Habitat by U.S. Fish and Wildlife Service for these endangered species and makes this river nationally important, as these fish are endemic to the Colorado River System. Lack of development throughout this reach of the river offers these rare fish species prime habitat for spawning, reproduction, and larval development, allowing for recovery of these endemic, unique species. The habitat condition and lack of development is important to species recovery of this river related resource. Utah Sensitive species identified here include the Flannelmouth Sucker, the Bluehead Sucker and the Roundtail Chub. This reach of the river is regionally and nationally important, as it provides excellent quality habitat for these declining species. **Cultural** This segment of the Colorado River is culturally significant at both regional and national levels. There is evidence of significant occupation

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	and use by both prehistoric and historic peoples. Native Americans consider the Colorado River and its major flowing tributaries as sacred spaces, making it nationally significant to native peoples. During prehistoric times Archaic peoples occupied the Colorado River Corridor, utilizing the available resources for food, clothing, shelter, and art. A wide variety of sites attest to this long-term occupation including alcoves, rock shelters, lithic scatters, rock art, and open campsites. Prehistoric sites have the potential to provide information concerning the use of the river corridor by Archaic and Fremont Culture. European homesteads and mining operations have also left a legacy in this section of the canyon. Because of the multitude of human activities that have taken place in the canyon, this section is historically significant on a regional basis. **Geology/Hydrology** The geology/hydrology component is of regional significance. A small section of the Uncompahgre Plateau extends westward as the downward-plunging nose of the ancient Uncompahgre Uplift, one of the most significant contributors to current Colorado Plateau topography. Here the Colorado River has down cut several hundred feet to create magnificent Westwater Canyon, where the geologic processes are interesting, highly visible, and outstandingly remarkable. The rock sequence runs from Precambrian (1.7 billion years old) to Cretaceous (150 million years old), with a 1.5 billion year nonconformity. Westwater and the inner gorge of the Grand Canyon are the only places on the Colorado Plateau where Precambrian rocks are exposed. From the Little Dolores River, the view upriver to the northwest is, in ascending order: Precambrian granites, Triassic Chinle Formation and Wingate Sandstone, Jurassic Kayenta Formation, Entrada Sandstone and Morrison Formation. From the same position looking upriver to the southeast, the strata are more steeply dipped and the deposits above the Kayenta have been eroded away. At the head of Westwater Canyon, the Little Dolores fault is a textbook example of a reverse fault where Jurassic Entrada Sandstone overlies Precambrian crystalline rocks, with a 500 foot displacement. In the narrow, polished inner gorge where the river encounters the resistant black rock of the Uncompahgre Complex, the Precambrian rock weathers extremely slowly and the growth of vegetation is restricted to benches and to small cracks and depressions where sandy soil has been deposited by wind or water. In the heart of Westwater Canyon where hard bedrock is not scoured during run-off events, the river may rise 10-15 feet with huge increases in velocity. Individual rapids lengthen and sometimes merge, with waves often reaching 8 feet high. The high water period of May-June produces the greatest range in monthly flows. Geologic sights of interest include the 200 foot gneiss cliffs above Skull Rapid and an abandoned meander at Big Hole where the river shortened its course by 2 miles, and down cut an additional 300 feet. Between Big Hole and Cottonwood Wash the Precambrian rocks pass under the river which then makes a gradual return to a meandering stream with large floodplains dominated by stands of tamarisk,

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	cottonwood and willow. Chinle, then Wingate, Kayenta and eventually the Morrison are exposed at river level. E**cological** The ecological values within this segment of the Colorado River are the same as described for Segment 1, and are of international, national and regional importance.
COLORADO RIVER SEGMENT (3) **River mile 112 to confluence with the Dolores River** **Classification:** Scenic from River mile 112 to Cisco; Recreational from Cisco to confluence with the Dolores River **BLM Free-flowing River Miles:** 11.2 **Reason for Free-flowing Determination:** Natural Flow	**Recreation** Recreation opportunities are regionally and nationally significant on this river segment. The terrain through which the Colorado River flows opens up into a broader valley at Rose Ranch. The slow moving water in this short stretch of river allows boaters to reflect on their trip through Westwater before taking out at Cisco. This stretch is boatable by most types of whitewater craft year round. The majority of use on this stretch is from those boaters finishing a Westwater trip. Some choose to extend their trip on the flat-water. This flat-water section is popular with commercial trips catering to national and international visitors, due to the pleasant scenery, lack of crowds, and wildlife viewing opportunities. Below Cisco this peaceful stretch of river is characterized by broad open expanses and long views, with the dark blue and snow-capped La Sals providing a scenic contrast to the arid bluffs and dense riparian vegetation along the stream. It is popular with boaters using small capacity vessels, beginning paddlers, and with those looking for solitude. Camping, hunting, hiking, wildlife viewing and fishing are other outstanding recreational opportunities available on this stretch of river. The Colorado River, the signature feature of the Colorado Plateau, provides outstanding and remarkable recreation in this stretch of the river. This section is boatable by most types of craft year round. It is particularly popular with youth groups, due to its non-technical nature. In addition, Utah State Highway 128 (a Utah Scenic Byway and part of the Prehistoric Highway National Scenic Byway) parallels the last three miles of this segment, providing a high quality scenic driving recreation opportunity. **Wildlife** Only the Colorado River provides such a rich variety of habitat for many types of wildlife species, both avian and terrestrial. It is important habitat on a regional basis for ungulates such as mule deer and elk. This reach of the Colorado River Corridor provides habitat for the Southwestern willow flycatcher, a federally listed species on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. Many types of raptors, including peregrine falcons, ferruginous hawks, Swainson's hawks, wintering bald eagles, and golden eagles, utilize the riverine corridor. Shorebirds and songbirds depend on the river, and it is important to neotropical migrants. All migrant birds that utilize this reach of the river are afforded federal protection under the Migratory Bird Treaty Act. The importance of the Colorado River to animals of many species cannot be overestimated. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	water. Water and the vegetative cover available within riparian areas offers needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. The Colorado River is the ultimate example of a riparian area providing the lifeblood to a diversity of species. This reach of the Colorado River contains 1 of only 4 known nesting sites for the Bald Eagle (*Haliaeetus leucocephalus*) within the entire State of Utah. (Two of these four nests are within segments one and three of the Colorado River Corridor.) Nesting bald eagles are a rare occurrence in the State of Utah and are afforded federal protection under the Bald Eagle Act. Nesting bald eagles are reliant on riparian corridors to nest and raise their young, making these nesting sites river related. These two bald eagle nest sites are monitored by both state and federal agencies annually and have been active for over 15 years. This reach of the river is regionally and nationally significant, as a rare and unique occurrence of this federally protected bird can be found. **Fish** The Colorado River is the home of four endangered fish species, the Colorado Pikeminnow, the Razorback Sucker, the Humpback Chub, and the Bonytail Chub. It is spawning grounds for the Colorado Pikeminnow and the Humpback Chub making this river nationally important, as these fish are endemic to the Colorado River System. It is considered Critical Habitat by U.S. Fish and Wildlife Service for these endangered species. Due to the limited development through this reach of the river, these rare fish species are able to spawn and reproduce, allowing for recovery of these endemic, unique species. The habitat condition and lack of development is important to species recovery of this river related resource. Utah Sensitive species identified here include the Flannelmouth Sucker, the Bluehead Sucker and the Roundtail Chub, making this reach of the river regionally important, as it provides sensitive habitat to these declining species. **Cultural** Human occupation of this section of the Colorado River extends from the early Archaic to Numic speaking populations. Native Americans consider the Colorado River and its major flowing tributaries as sacred places. The variety and number of archaeological and historical sites adjacent to the river embrace the occupation of prehistoric and historic peoples. Sites include alcoves, rock shelters, lithic scatters, rock art, and open campsites. Prehistoric sites have the potential to provide information concerning the use of the river corridor by Archaic and Formative Cultures. Likewise, historic people capitalized on the river's water resources by constructing ditches to feed agricultural fields and budding homesteads. A major water pumping station was built in this stretch of river in order to transport water from the river to the station at Cisco for the Denver and Rio Grande Railroad. The Colorado River has been the focus of human habitation from prehistoric to historic times, making it the cultural hub of this region. **Ecological** The ecological values within this segment of the Colorado River are the

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	same as described for Segment 2, and are of international, national and regional importance.
COLORADO RIVER SEGMENT (4) **Confluence with the Dolores River to river mile 49 near Potash Plant** **Classification:** Recreational **BLM Free-flowing River Miles:** 32.6 **Reason for Free-flowing Determination**: Natural Flow	**Scenery** This segment of the river is a very popular scenic float, as well as a beautiful scenic drive. Visitors from all over the nation, as well as from all over the world, consider it one of the most scenic resources in the entire United States. It contains some of the most outstanding scenery in the region. There are several signs of human habitation including State Highway 128 (a Utah Scenic Byway and part of the Prehistoric Highway National Scenic Byway), several ranches and agricultural treatments, and the historic Dewey Bridge, constructed in 1916. Sheer cliffs dominate, and gradually rise on each side. The Entrada formation appears, and is topped with Morrison formation deposits. The rock at river level is Navajo Sandstone. The rock formations become increasingly detailed and striking. The river enters the Richardson Amphitheater and internationally recognized formations such as Fisher Towers, The Titan, The Rectory, The Priest and the Nuns, Castle Rock, and many unnamed spires and formations come into view. The river enters a tight canyon where the Moenkopi Formation is exposed. The river winds through large boulders and steep cliffs and the immense meander of Big Bend is very prominent. The geologic strata once again descend, with the Moenkopi going underground and the Wingate Sandstone cliffs dropping to a lower level, and dominating the view. The river is now bordered by Arches National Park on the north and the Sand Flats Recreation Area on the south. The steep sheer cliffs on the south with prominent displays of desert varnish, and the outstanding petrified dunes and spires of Arches National Park on the north dominate the formations from Negro Bill Canyon to U. S. Highway 191. The landform of this segment is the most diverse display of outstanding geology along the river, as well as one of the most remarkable displays in the entire world. The open valleys and tight canyons and rock formations make this area outstanding and remarkable based on the geology and landform alone. The vegetation is richly riparian and the water is a dominant feature. The color of this segment is rich with pleasing contrasts between the varied colors of red and brown in the landform, and the green and gold of the vegetation, which change colors with the seasons. This segment of the Colorado River is truly outstanding and remarkable on a national level; its scenery is internationally recognized. At "The Portal" the river cuts through the Wingate Sandstone. At this point the river canyon narrows and the banks become heavily vegetated. The cliffs along this section are massive and imposing. The Navajo Sandstone at river level on both sides of the river has eroded into near vertical cliffs. On the south side of the river are the fins and domes of Navajo Sandstone. The Kayenta Sandstone appears at river level with the Wingate Sandstone disappearing. The outstanding geology of this segment adds greatly to the visual quality and several arches and prominent features are visible from the river.

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	Recreation This stretch of the Colorado River is popular for flat water boating as well as mild whitewater boating. It is floatable year round, but most boaters make use from May to mid-September. Outfitters market this trip both nationally and internationally. Youth and family groups enjoy this stretch of river due to the mild character and great views. Most of this stretch is flat with a ten-mile stretch of class II-III rapids. Views vary from the wide valley near Castle Valley to the tight red Wingate canyon. State Highway 128 parallels the river but does not detract from the float trip. Camping, fishing, hiking, climbing, and horseback riding are popular activities in the river corridor. The BLM has developed campgrounds along the river, and private landowners have built resorts along the river. The recreation opportunities are enjoyed by one half million people per year. Downstream from Moab the Colorado River is popular for flat-water boaters, motorized and non-motorized. Jet boats shuttle canoe trips from the confluence of the Green and Colorado River in Canyonlands National Park back to Moab using this stretch. Some boaters canoe to the confluence, and are motored back to Moab. It is floatable year round, but most boaters make use from May to mid-September. Outfitters market this trip both nationally and internationally. This spectacular Wingate canyon is the gateway to Canyonlands National Park. Roads parallel both sides of this stretch of river but do not detract from the float trip. Camping, fishing, climbing, and hiking are popular activities in the river corridor. The recreation opportunities are outstanding and remarkable within the region, as well as nationally. The BLM has developed campgrounds along the river. **Wildlife** Only the Colorado River has important wildlife habitat for a variety and diversity of species, both avian and terrestrial. The Colorado provides crucial habitat for raptors, including the bald eagle and the peregrine falcon. Wintering geese and ducks depend on the Colorado, as do all types of shorebirds and songbirds. Great Blue Herons are commonly seen. All migrant birds that utilize this reach of the river are afforded federal protection under the Migratory Bird Protection Act. This reach of the Colorado River Corridor offers habitat for Mexican spotted owl and Southwestern willow flycatcher, both federally listed on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. Only along the Colorado River, can as great a diversity of terrestrial species survive. The river corridor supports diverse species such as deer, coyote, beaver, river otter, and desert bighorn sheep. This segment of the Colorado is particularly important habitat for the survival of the desert bighorn sheep. The importance of the Colorado River corridor as wildlife habitat within this region cannot be underestimated. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	many species. There is no more important riparian habitat within the region than the Colorado River corridor. The proximity of this stretch to the Nature Conservancy's Matheson Wetlands adds to its habitat value by offering protected wildlife corridors and reducing habitat fragmentation. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Only the Colorado River can offer this quality of habitat. **Fish** The Colorado River is the home of four endangered fish species, the Colorado Pikeminnow, the Razorback Sucker, the Humpback Chub, and the Bonytail Chub. This reach of the Colorado is spawning grounds for the Colorado Pikeminnow, and the Razorback Sucker, and possibly the Bonytail. It is considered Critical Habitat by U.S. Fish and Wildlife Service for these endangered species, making this river nationally important, as these fish are endemic to the Colorado River System. Lack of development throughout this reach of the river offers these rare fish species prime habitat for spawning, reproduction, and larval development, allowing for recovery of these endemic, unique species. The habitat condition and lack of development is important to species recovery of this river related resource. Utah sensitive species identified here include the Flannelmouth Sucker, the Bluehead Sucker and the Roundtail Chub, making this reach of the river regionally important, as it provides sensitive habitat to these declining species. **Cultural** The Colorado River has evidence of significant occupation and use by both prehistoric and historic peoples. Native Americans consider the Colorado River and its major flowing tributaries as sacred places making it nationally significant to native peoples. The variety and number of archaeological and historical sites adjacent to the river embrace the occupation of prehistoric and historic peoples. Sites include alcoves, rock shelters, lithic scatters, rock art, and open campsites, as well as European homesteads. Prehistoric sites have the potential to provide information concerning the use of the river corridor by Archaic, Fremont and Anasazi Cultures as well as Numic speaking peoples. As travel between the southwest and the Pacific coast increased, early travelers and traders utilized fords and crossings along the Colorado River. The Dewey Bridge, completed in 1916, opened up both sides of the Colorado River to private and commercial traffic. The road up the Colorado River, including the Dewey Bridge, later became the basis for State Highway 128. The Dewey Bridge is unique in that it is the longest suspension bridge in Utah and was listed on the National Register of Historic Places on July 12, 1984. **Geology** Geology is on display along the Colorado River corridor, because nowhere are rocks better exposed than along its sheer, bare walls. It is here that geologists come to see evidence of the principle of uniformitarianism; that the processes of erosion and deposition that are active on the surface of the earth today have also been active in the geologic past. Unique to the Colorado Plateau is the lack of a marked

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	unconformity at the systemic boundary between rocks of the Paleozoic and Mesozoic Eras; the uppermost of the former, of Permian age, and the lowermost of the latter, of Triassic Age, are structurally conformable. Also unique to this part of the Colorado Plateau are structural features known as collapsed salt anticlines. When under differential pressure, evaporite minerals flow toward the crests of anticlines, which are parts of folds first susceptible to ground water. The minerals are dissolved and the overlying rocks collapse along gravity faults. Such faults occur and can be seen at Salt Wash, Cache Valley, Castle Valley and Fisher Valley all located along this segment. In the area of Salt Wash a conglomerate anomaly occurs which some have correlated to the Shinarump Conglomerate of the Chinle Formation. The origin of this conglomerate is not well understood. Unusual sedimentary structures may be observed in the Dewey Bridge Member of the Entrada Sandstone whose type locality is where Dewey Bridge crosses the Colorado River. The intricate crenulations in this unit are neither the result of movements in the earth's crust nor do they correspond with folds in the underlying and overlying formations, but rather they were formed because they were saturated with water and were not lithified when the overlying sands were deposited. Throughout this corridor several seeps, alcoves and arches of varying sizes can be seen and excellent examples of entrenched meanders abound. This geologic process is uniquely exposed along the Colorado River. As the Colorado River flows downstream from US Highway 191 it crosses the collapsed Moab Valley salt anticline and the Moab fault zone. The crossing is a paradox in that the river cuts across the valley rather than flowing through it - this indicates that the pattern of the Colorado River and its meanders were established before the valley existed. The core of the anticline is represented by an exposure of the Paradox Formation as a punky residue of gypsum and anhydrite from which soluble salts have been leached near the Portal, where the river enters another canyon. The extensive low area beside the river, the Matheson Wetlands, occurs because of the subterranean solution of salt. Vertical displacement along the Moab fault zone is several thousand feet. Traveling downstream is at first like traveling forward in time, as younger and younger rocks reach river level, abruptly at first and then more gradually after the Navajo Sandstone appears. About 3 river miles downstream from the Portal, the river crosses the axis of the Kings Bottom Syncline and the rock sequence is reversed as if traveling backward in time through the Kayenta Formation, Wingate Sandstone, Chinle, Mossback and Moenkopi Formations, which rise gently on the side of the Kane Creek Anticline to Jackson Bottom. Many cliffs in this river corridor are covered with desert varnish, a complex patina of clay, iron hydroxide and manganese oxide deposited by bacterial action. Jackson Hole is a classic textbook example of an abandoned meander. The river course was shortened by about 3 miles when the Jackson Hole meander was abandoned. The Permian Lower Cutler Beds (once reported as the type locality for the no-longer recognized Elephant Canyon Formation) are exposed at river level. Petrified wood, fossil corals, bryozoans, brachiopods and fusilinids occur with great frequency in this formation. Chinle and Wingate sandstones overlie the Cutler.

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	Due to the diversity and abundance of features, the educational and scientific values described above, the values found along segment 4 of the Colorado River were found to be outstanding regionally and nationally. **Ecological** The ecological values within this segment of the Colorado River are the same as described for Segment 2, and are of international, national and regional importance.
COLORADO RIVER SEGMENT (5) **River mile 44.5 to mile 38.5 at State land boundary** **Classification:** Scenic **BLM Free-flowing River Miles:** 6.1 **Reason for Free-flowing Determination:** Natural Flow	**Scenery** The Colorado River cuts through the Kane Creek Anticline, and the colors and layering of the sedimentary rocks are outstanding. The landform in this section is outstanding within the Colorado Plateau, with vertical cliffs and prominent features such as arches and spires adding to the already rich rock strata. The water is a dominant feature and adds motion and a variety of surfaces. The color of the area is rich in contrast and the adjacent scenery greatly enhances the visual quality. This segment is distinctive and the addition of arches and other outstanding features adds to the scarcity of this section. The river flows through the outstanding geology at the base of Dead Horse Point State Park. The large meander of the river at this point has been the focus of many a post card and scenic photo as the river carves through multiple layers of geology that has cut into the Wingate, Kayenta, and Navajo Sandstone. The river continues in this outstanding vein all the way to Canyonlands National Park boundary. The vegetation is a variety of riparian species that create interesting forms and patterns. The water is a dominant feature, and adds motion and a variety of surfaces. The color contrasts are strong, and the effects of the adjacent scenery are high. All of these elements when combined make the values in this section outstanding and remarkable within the physiographic region. The scenery in this segment is internationally recognized as unique and outstanding. The Colorado River is the signature feature of the region known as the Colorado Plateau, and is nationally significant. **Recreation** Downstream from Moab the Colorado River is popular for flat-water boaters, motorized and non-motorized. Jet boats shuttle canoe trips from the confluence of the Green and Colorado River in Canyonlands National Park back to Moab using this stretch. Some boaters canoe to the confluence, and are motored back to Moab. It is floatable year round, but most boaters make use from May to mid-September. Outfitters market this section as part of a Cataract Canyon trip both nationally and internationally. This spectacular Wingate canyon is the gateway to Canyonlands National Park. Camping, fishing, and hiking are popular activities in the river corridor. Below the Potash Plant, the Wingate cliffs give way to a broad view of the Shafer Basin. A few primitive roads are present within the river corridor but are not very noticeable from the river. .

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	Wildlife Only the Colorado River has such important wildlife habitat for a variety and diversity of species, both avian and terrestrial. The Colorado provides crucial habitat for raptors, including the bald eagle and the peregrine falcon. Wintering geese and ducks depend on the Colorado, as do all types of shorebirds and songbirds. Great Blue Herons are commonly seen. All migrant birds that utilize this reach of the river are afforded federal protection under the Migratory Bird Treaty Act. This reach of the Colorado River Corridor offers habitat for Mexican spotted owl and Southwestern willow flycatcher, both federally listed on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. Only along the Colorado River, can as great a diversity of terrestrial species survive. The river corridor supports diverse species such as deer, coyote, beaver, river otter, and desert bighorn sheep. This segment of the Colorado is particularly important habitat for the survival of the desert bighorn sheep. The importance of the Colorado River corridor as wildlife habitat within this region cannot be underestimated. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. There is no more important riparian habitat within the region than the Colorado River corridor. **Fish** The Colorado River is the home of four endangered fish species, the Colorado Pikeminnow, the Razorback Sucker, the Humpback Chub, and the Bonytail Chub. This reach of the Colorado includes spawning grounds for the Colorado Pikeminnow, and the Razorback Sucker, and possibly the Bonytail. It is considered Critical Habitat by U.S. Fish and Wildlife Service for these endangered species, making this river nationally important, as these fish are endemic to the Colorado River System. Lack of development throughout this reach of the river offers these rare fish species prime habitat for spawning, reproduction, and larval development, allowing for recovery of these endemic, unique species. The habitat condition and lack of development is important to species recovery of this river related resource. Utah sensitive species identified here include the Flannelmouth Sucker, the Bluehead Sucker and the Roundtail Chub, making this reach of the river regionally important, as it provides sensitive habitat to these declining species. **Cultural** The Colorado River has evidence of significant occupation and use by both prehistoric and historic peoples. Native Americans consider the Colorado River and its major flowing tributaries as sacred places, making it nationally significant to native peoples. The variety and number of archaeological and historical sites adjacent to the river embrace the occupation of prehistoric and historic peoples. Sites include

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	alcoves, rock shelters, lithic scatters, rock art, and open campsites, as well as European homesteads. Prehistoric sites have the potential to provide information concerning the use of the river corridor by Archaic, Fremont and Anasazi Cultures as well as Numic speaking peoples. **Ecological** Ecologically, the Colorado River is the fifth longest river system in the nation (approximately 1,400 miles long) and drains approximately 242,000 square miles of watershed. The Colorado River Basin includes portions of seven states and Mexico and provides water to millions of people. The Colorado River is adjacent to the Pacific Flyway and provides important habitat for many migrating neo-tropical, shorebird, and waterfowl species. The aquatic, wetland and riparian habitats that are found in the Colorado River corridor provide for the existence of many wildlife species. The river corridor contains vegetative islands that serve as important refuge and nesting habitats for many migrant waterfowl species including the Canada goose, plovers, etc. The river corridor contains some of the last remnant populations of river otters, as well as nesting and forage habitat for endangered bald eagle, endangered Mexican spotted owl, endangered Southwestern willow flycatcher, sensitive bats, as well as 4 species of endangered native fish endemic only to the Colorado River system. While ecologically important, the Colorado River is not in high quality condition due to channel morphology, exotic/invasive species (tamarisk, Russian olive, Russian knapweed). Even with reduced health and diversity of the system, the ecological resources of the Colorado River are outstandingly remarkable on an international, national and regional basis.
COLORADO RIVER SEGMENT (6) **From State land at river mile 37.5 to mile 34 at Canyonlands National Park boundary** **Classification:** Scenic **BLM Free-flowing River Miles:** 3.8 **Reason for Free-flowing Determination:**	**Scenery** The Colorado River cuts through the Kane Creek Anticline, and the colors and layering of the sedimentary rocks are outstanding. The landform in this section is outstanding within the Colorado Plateau, with vertical cliffs and prominent features such as arches and spires adding to the already rich rock strata. The water is a dominant feature and adds motion and a variety of surfaces. The color of the area is rich in contrast and the adjacent scenery greatly enhances the visual quality. This segment is distinctive and the addition of arches and other outstanding features adds to the scarcity of this section. The river flows through the outstanding geology at the base of Dead Horse Point State Park. The large meander of the river at this point has been the focus of many a post card and scenic photo as the river carves through multiple layers of geology that has cut into the Wingate, Kayenta, and Navajo Sandstone. The river continues in this outstanding vein all the way to Canyonlands National Park boundary. The vegetation is a variety of riparian species that create interesting forms and patterns. The water is a dominant feature, and adds motion and a variety of surfaces. The color contrasts are strong, and the effects of the adjacent scenery are high. All of these elements when combined make the values in this section outstanding and remarkable within the physiographic region. The scenery in this segment is internationally recognized as unique and outstanding. The

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
Natural Flow	Colorado River is the signature feature of the region known as the Colorado Plateau, and is nationally significant. **Recreation** Downstream from mile 37.5, the Colorado River is popular for flat-water boaters, motorized and non-motorized. Jet boats shuttle canoe trips from the confluence of the Green and Colorado River in Canyonlands National Park back to Moab using this stretch. Some boaters canoe to the confluence, and are motored back to Moab. It is floatable year round, but most boaters make use from May to mid-September. Outfitters market this trip both nationally and internationally. This spectacular Wingate canyon is the gateway to Canyonlands National Park. Camping, fishing, and hiking are popular activities in the river corridor. Below the Potash Plant, the Wingate cliffs give way to a broad view of the Shafer Basin. No roads dissect this peaceful stretch of the Colorado. Outfitters market this section as part of a Cataract Canyon trip both nationally and internationally. **Wildlife** Only the Colorado River has such important wildlife habitat for a variety and diversity of species, both avian and terrestrial. The Colorado provides crucial habitat for raptors, including the bald eagle and the peregrine falcon. Wintering geese and ducks depend on the Colorado, as do all types of shorebirds and songbirds. Great Blue Herons are commonly seen. All migrant birds that utilize this reach of the river are afforded federal protection under the Migratory Bird Treaty Act. This reach of the Colorado River Corridor offers habitat for Mexican spotted owl and Southwestern willow flycatcher, both federally listed on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. Only along the Colorado River, can as great a diversity of terrestrial species survive. The river corridor supports diverse species such as deer, coyote, beaver, river otter, and desert bighorn sheep. This segment of the Colorado is particularly important habitat for the survival of the desert bighorn sheep. The importance of the Colorado River corridor as wildlife habitat within this region cannot be underestimated. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. There is no more important riparian habitat within the region than the Colorado River corridor. **Fish** The Colorado River is the home of four endangered fish species, the Colorado Pikeminnow, the Razorback Sucker, the Humpback Chub, and the Bonytail Chub. This reach of the Colorado includes spawning grounds for the Colorado Pikeminnow, and the Razorback Sucker, and possibly the Bonytail. It is considered Critical Habitat by U.S. Fish and Wildlife Service for these endangered species, making this river

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	nationally important, as these fish are endemic to the Colorado River System. Lack of development throughout this reach of the river offers these rare fish species prime habitat for spawning, reproduction, and larval development, allowing for recovery of these endemic, unique species. The habitat condition and lack of development is important to species recovery of this river related resource. Utah sensitive species identified here include the Flannelmouth Sucker, the Bluehead Sucker and the Roundtail Chub, making this reach of the river regionally important, as it provides sensitive habitat to these declining species. **Cultural** The Colorado River has evidence of significant occupation and use by both prehistoric and historic peoples. Native Americans consider the Colorado River and its major flowing tributaries as sacred places making it nationally significant to native peoples. The variety and number of archaeological and historical sites adjacent to the river embrace the occupation of prehistoric and historic peoples. Sites include alcoves, rock shelters, lithic scatters, rock art, and open campsites, as well as European homesteads. Prehistoric sites have the potential to provide information concerning the use of the river corridor by Archaic, Fremont and Anasazi Cultures as well as Numic speaking peoples. **Ecological** The ecological values within this segment of the Colorado River are the same as described for Segment 2, and are of international, national and regional importance.
SALT WASH **Arches NP boundary to Colorado River** **Tentative Classification**: Wild **Reason for Tentative Classification:** Road present across Colorado River. **BLM Free-flowing River Miles:** 0.3 NPS Miles: 6 **Reason for Free-flowing Determination:** Natural Flow	Outstandingly remarkable values are the same as those found within the boundary of Arches National Park. BLM finds this segment eligible only if connected to the segment within the park. Outstandingly Remarkable Values identified by NPS include: scenery, recreation, geology, wildlife and fish. **Scenery** Kayenta Sandstone cliffs are prominent at the mouth of Salt Wash. The desert varnish and outstanding alcoves add a great degree of contrast and form to this segment. The vegetation is lush and gives a variety of colors and textures, along with a strong riparian line. The colors are outstanding, and change drastically from morning to night. The adjacent scenery adds to the visual quality, and the drainage is distinctive. All of these elements make the values in this segment outstanding and remarkable within the region. **Recreation** Salt Wash is a popular hike for boaters on Colorado River trips. Boaters have the opportunity, just a short distance from the river, to access proposed wilderness areas inside Arches National Park. This segment does not receive heavy visitation. This provides the recreationist with an opportunity to enjoy the scenery without crowds. Access is limited to boaters from the river or via a trailhead six miles upstream inside Arches National Park. The elements listed above make the values in this segment outstanding and remarkable within the region.

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	Wildlife Salt Wash provides lush riparian habitat serving as home range for mountain lion, mule deer, and a multitude of other wildlife. This is regionally significant habitat due to the lack of roads, development, and protection provided by being connected to Arches National Park. **Fish** This segment is possible spawning habitat for endangered Colorado Pikeminnow, as well as for the species mentioned for the Colorado River corridor. This reach of the river is regionally important, as it provides sensitive habitat to these declining species. **Geology** Kayenta Sandstone cliffs are prominent here. The Salt Wash syncline is present. In Arches and at the mouth of Salt Wash, and is an excellent example of the variety of geologic forces shaping the land by underlying salt formations prevalent to this region.

DOLORES RIVER: SEGMENT (1) **CO-UT state-line to Fisher Creek** **Classification:** Recreational . **BLM Free-flowing River Miles:** 5.9 **Reason for Free-flowing Determination:** Natural Flow	**Scenery** This section of the Dolores River is characterized by an increase in vertical relief from the segment in Colorado. The canyon narrows to about one-quarter mile wide with sheer walls of Wingate Sandstone almost 500 feet high lining the river's course. The few long vistas available in this narrow canyon reveal the colorful strata above the Wingate, the Kayenta, the Navajo (which makes a distinctive beige cliff), the pink band of the Entrada and the ledgey Morrison Formation. Cottonwoods, willows, and tamarisk, as well as a variety of desert shrubs and grasses characterize the vegetation. The flow of this reach is relatively quick, with several rapids. The presence of the river adds motion and a variety of surface, as well as a gathering place for wildlife. The rich color combinations of the geology, vegetation, and water makes for a pleasing contrast which changes with the season. This segment is quite distinctive, and only segments of the Colorado River would be comparable. The combination of these elements along with the recreational use of the river by boaters, make these segments of the river outstanding and remarkable even within the Colorado Plateau. **Recreation** A float trip on the Dolores River offers spectacular views, camping, scenic hiking opportunities, and whitewater boating challenges for boaters who like technical rivers. The Dolores River attracts boaters from all over the intermountain west; it also attracts international visitors. The Dolores River is floatable by rafts, kayaks, and other whitewater craft during spring runoff, usually during the last part of April, May, and beginning of June. The season length varies with the snow pack, and releases from McPhee Reservoir. Opportunities for solitude abound. Hunting and horseback riding are also popular along the river corridor. A

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	primitive road parallels the river upstream from Fisher Creek but sees little use. All this combines to make the Dolores River a regionally significant recreation opportunity. **Wildlife** This segment of the Dolores River is vitally important mule deer and elk winter range. In addition, the canyon is important to a diversity of avian and terrestrial wildlife. It is particularly crucial to raptor species, as it provides excellent habitat for them. The Dolores offers habitat for the Southwestern willow flycatcher, a federally listed species on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. The Dolores River corridor also provides important habitat for neotropical migrants. The Southwestern blackheaded snake is found in this canyon. Bear and mountain lion also inhabit this river segment. Due to limited development, this reach of the river offers wildlife low levels of fragmentation, resulting in a diverse, vigorous and self-sustaining wildlife population. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. The Dolores River corridor is regionally significant for wildlife values. **Fish** Utah Division of Wildlife Resources has determined that two Utah Sensitive species, the Bluehead Sucker and the Roundtail Chub inhabit the Dolores River. This area provides needed habitat for these native fish, making this reach of the river regionally important, as it provides sensitive habitat to these declining sensitive species. **Geology/Hydrology** Segment one begins at the most impressive rapid on the Dolores, known as Stateline Rapid. Outwash from a gully on the north bank created the rapid, and cliff fall from the southern walls of Wingate Sandstone has increased the difficulty of it. Upstream of the Utah-Colorado state line, strata generally dip toward the northwest, in the direction of river flow, and gradually pass beneath the river. As they dip under the river in the area of the Stateline rapid, the canyon narrows. Steep Cutler, Moenkopi and Chinle bluffs slope about 800 feet up from the river to meet vertical Wingate cliffs that rise up to 2,500 feet above the valley floor. Below Stateline rapid lie others, also complicated by fallen boulders of Wingate Sandstone. The north (right) shore grows steeper and its angular talus slopes impinge on the river. The rivers course is in the upper Moenkopi or lower Chinle, but these red shales are generally covered by fan-shaped talus slopes and detritus accumulations, which support vegetation. Below the Chinle, in the area of the Dolores, are the three shaley members of the Moenkopi Formation, and the Cutler Formation of purple arkosic sandstone and conglomerate. High above it, atop the Kayenta, are exposures of buff Navajo Sandstone. In addition the canyon displays excellent visibility of

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	the geologic process and an unusually long sequence of Colorado Plateau stratigraphy. The Dolores River canyon is an important key to the Uncompahgre Uplift and to understanding the stream piracy of the ancestral Gunnison and Colorado rivers. The geology within the river corridor as described above; shows diversity and abundance of geologic features. In addition, the educational and scientific values make this river outstanding in the region. **Ecological** The Dolores River supports river-related values including fisheries, wildlife, scenic, and recreational resources found important within the region. The Dolores River provides stream flows to maintain picturesque cottonwood galleries and wetlands, State sensitive fisheries and wildlife habitats, and recreational river running. The Dolores River is a large tributary to the Upper Colorado River which contributes seasonal inflow important to the Colorado River and creates important endangered fish rearing habitat at the Confluence. Although the Dolores River ecosystem is severely altered and controlled by water diversions, including McPhee Dam within the state of Colorado, surface flows and riverine conditions are present to be determined free-flowing. Ecological conditions are also degraded with respect to encroachment of noxious weeds and invasive exotic species (Russian knapweed, Russian olive, tamarisk etc). While ecological values are diminished within the Dolores River, they remain important in supporting other river-related resources which have been determined outstandingly remarkable.
DOLORES RIVER: SEGMENT (2) **Fisher Creek to Bridge Canyon** **Classification:** Scenic **BLM Free-flowing River Miles:** 6.2 **Reason for Free-flowing Determination:** Natural Flow	**Scenery** This section of the Dolores River is characterized by a narrow canyon that is about one-quarter mile wide with sheer walls of Wingate Sandstone almost 500 feet high lining the river's course. The few long vistas available in this narrow canyon reveal the colorful strata above the Wingate, the Kayenta, the Navajo (which makes a distinctive beige cliff), the pink band of the Entrada and the ledgey Morrison Formation. Cottonwoods, willows, and tamarisk, as well as a variety of desert shrubs and grasses characterize the vegetation. The flow of this reach is relatively quick, with several rapids. The presence of the river adds motion and a variety of surface, as well as a gathering place for wildlife. The rich color combinations of the geology, vegetation, and water makes for a pleasing contrast which changes with the season. This segment is quite distinctive, and only segments of the Colorado River would be comparable. The combination of these elements along with the recreational use of the river by boaters, make these segments of the river outstanding and remarkable even within the Colorado Plateau. **Recreation** A float trip on the Dolores River offers spectacular views, camping, scenic hiking opportunities, and whitewater boating challenges for boaters who like technical rivers. The Dolores River attracts boaters from all over the intermountain west; it also attracts international visitors. The Dolores River is floatable by rafts, kayaks, and other whitewater craft during spring runoff, usually during the last part of April, May, and beginning of June. The season length varies with the snow pack, and

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	releases from McPhee Reservoir. Opportunities for solitude abound. Hunting and horseback riding are also popular along the river corridor. The Dolores from Fisher Creek to Bridge Canyon has no road access. All this combines to make the Dolores River a regionally significant recreation opportunity. **Wildlife** This segment of the Dolores River is vitally important mule deer and elk winter range. In addition, the canyon is important to a diversity of avian and terrestrial wildlife. It is particularly crucial to raptor species, as it provides excellent habitat for them. The Dolores offers habitat for the Southwestern willow flycatcher, a federally listed species on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. The Dolores River corridor also provides important habitat for neotropical migrants. The Southwestern blackheaded snake is found in this canyon. Bear and mountain lion also inhabit this river segment. Due to limited development, this reach of the river offers wildlife low levels of fragmentation, resulting in a diverse, vigorous and self-sustaining wildlife population. Within the arid southwest all riparian habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offer needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. The Dolores River corridor is regionally significant for wildlife values. **Fish** Utah Division of Wildlife Resources has determined that two Utah Sensitive species, the Bluehead Sucker and the Roundtail Chub inhabit the Dolores River. This area provides needed habitat for these native fish, making this reach of the river regionally important, as it provides sensitive habitat to these declining sensitive species. **Geology/Hydrology** Segment two of the Dolores River is characterized by steep Cutler, Moenkopi and Chinle bluffs which slope about 800 feet up from the river to meet vertical Wingate cliffs that rise up to 2,500 feet above the valley floor. The river's course is in the upper Moenkopi or lower Chinle, but these red shales are generally covered by fan-shaped talus slopes and detritus accumulations, which support vegetation. Below the Chinle, in the area of the Dolores, are the three shaley members of the Moenkopi Formation, and the Cutler Formation of purple arkosic sandstone and conglomerate. High above it, atop the Kayenta, are exposures of buff Navajo Sandstone. The Dolores has spectacularly variable flows, even as compared to other rivers throughout the desert southwest, which makes it remarkable. In addition the canyon displays excellent visibility of the geologic process and an unusually long sequence of Colorado Plateau stratigraphy. The Dolores River canyon is an important key to the Uncompahgre Uplift and to understanding the stream piracy of the ancestral Gunnison and Colorado rivers. The geology within the river corridor as described above shows diversity and abundance of geologic

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River/Segment Name and Other Information	Description Of Values Present
	features. In addition, the educational and scientific values make this river outstanding in the region. **Ecological** The Dolores River supports river-related values including fisheries, wildlife, scenic, and recreational resources found important within the region. The Dolores River provides stream flows to maintain picturesque cottonwood galleries and wetlands, State sensitive fisheries and wildlife habitats, and recreational river running. The Dolores River is a large tributary to the Upper Colorado River which contributes seasonal inflow important to the Colorado River and creates important endangered fish rearing habitat at the Confluence. Although the Dolores River ecosystem is severely altered and controlled by water diversions, including McPhee Dam within the state of Colorado, surface flows and riverine conditions are present to be determined free-flowing. Ecological conditions are also degraded with respect to encroachment of noxious weeds and invasive exotic species (Russian knapweed, Russian olive, tamarisk etc). While ecological values are diminished within the Dolores River, they remain important in supporting other river-related resources which have been determined outstandingly remarkable.
DOLORES RIVER: SEGMENT (3) **Bridge Canyon to the Colorado River** **Classification:** Recreational . **BLM Free-flowing River Miles:** 9.9 **Reason for Free-flowing Determination:** Natural Flow	**Recreation** A trip on the Dolores River offers spectacular views, camping, scenic hiking opportunities, and whitewater boating challenges. This stretch is popular with youth groups, due to the ease of getting permits. The Dolores River attracts boaters from the intermountain west, as well as international visitors. It is floatable by rafts, kayaks, and other whitewater craft during spring runoff, usually during the last part of April, May, and beginning of June. The season length varies with the snow pack, and releases from McPhee Reservoir. Opportunities for solitude abound. There is primitive road access to this stretch. It has remarkable and outstanding recreation values within the Colorado Plateau. **Wildlife** This segment of the Dolores River is vitally important mule deer and elk winter range. In addition, the canyon is important to a diversity of avian and terrestrial wildlife. The Dolores River corridor is the second richest riparian area in the Colorado Plateau and as such, is crucial to raptor species such as the peregrine falcon, as it provides excellent habitat for them. The Dolores offers habitat for the Southwestern willow flycatcher, a federally listed species on the Endangered Species List. The Southwestern willow flycatcher is directly reliant on habitat that offers free standing water, riparian plant species, vegetative cover, and water related insects to nest and raise their young. The Dolores River corridor also provides habitat for neotropical migrants. The Southwestern blackheaded snake is found in this canyon. Bear and mountain lion also inhabit this river segment. Many species of bats are found in this stretch of the Dolores, of which several are listed on the Utah Sensitive Species List. The Northern River Otter has been identified as utilizing this stretch of the Dolores. Due to limited development, this reach of the river offers wildlife low levels of fragmentation, resulting in a diverse, vigorous and self-sustaining wildlife population. Within the arid southwest all riparian

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River/Segment Name and Other Information	Description Of Values Present
	habitat is vital to all forms of wildlife, due to the lack of available free water. Water and the vegetative cover available within riparian areas offers needed drinking water, microclimates, food, and cover to wildlife and the various life stages of many species. The Dolores River has remarkable and outstanding wildlife values. **Fish** The confluence of the Dolores and the Colorado River provides habitat for the endangered Colorado Pikeminnow, making this river nationally important, as these fish are endemic to the Colorado River System. Due to the limited development through this reach of the river, this rare fish species is able to spawn and reproduce, allowing for recovery of this endemic, unique species. Utah Division of Wildlife Resources has determined that two Utah Sensitive species, the Bluehead Sucker and the Roundtail Chub live in the Dolores Rivers. This area provides needed habitat for these native fish, making this reach of the river regionally important, as it provides sensitive habitat to these declining species. **Geology** In the area of Utah Bottom, the axis of the Sagers Wash Syncline crosses the river, replacing the general southwestern dip of the rock off the Uncompahgre Plateau with a northeasterly dip, the result of the Yellow Cat dome that lies west of the Colorado River. Perhaps the most striking geologic feature in the Utah Bottom area is the Entrada sandstone with its distinctive cross-hatching. An oxbow in the Lake Bottom area marks a change to rising strata and the river re-encounters Entrada Sandstone at its confluence with the Colorado. This is a unique geologic process for the region. **Ecological** The Dolores River supports river-related values including fisheries, wildlife, scenic, and recreational resources found important within the region. The Dolores River provides stream flows to maintain picturesque cottonwood galleries and wetlands, State sensitive fisheries and wildlife habitats, and recreational river running. The Dolores River is a large tributary to the Upper Colorado River which contributes seasonal inflow important to the Colorado River and creates important endangered fish rearing habitat at the Confluence. Although the Dolores River ecosystem is severely altered and controlled by water diversions, including McPhee Dam within the state of Colorado, surface flows and riverine conditions are present to be determined free-flowing. Ecological conditions are also degraded with respect to encroachment of noxious weeds and invasive exotic species (Russian knapweed, Russian olive, tamarisk etc). While ecological values are diminished within the Dolores River, they remain important in providing the basis for and supporting other river-related resources which have been determined outstandingly remarkable.
GREEN RIVER DRAINAGES: The Price Field Office (in coordination with the Moab Field Office) reviewed segments 1 through 6 of the Green River as part of the Price Field Office RMP.	
GREEN RIVER:	**Cultural**

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
TAVAPUTS PLATEAU (DESOLATION CANYON) **Segment (1): Coal Creek to Nefertiti Boat Ramp** **Segment (2): Nefertiti Boat Ramp to Swasey's Boat Ramp** **Classification:** Segment (1): Wild Segment (2): Recreational **Total River Miles:** Segment (1): 6 Segment (2): 8 **Reason for Free-flowing Determination:** (All segments) Natural Flow	This area has evidence of significant occupation and use by prehistoric peoples. It includes rock art and other features that remain significant to some Native American populations today. It also includes some of area of study used by Noel Morss in defining of the Fremont Culture. The prehistoric use represents more than one cultural period (Archaic, Fremont and Numic). The sites have been largely isolated and retain integrity. They are important for interpreting regional prehistory. Many sites are eligible for the National Register of Historic Places. Flat Canyon Archaeological District, within Desolation Canyon, is listed on this register. **Historic** Much of this river corridor is a National Historic Landmark because of its recognition as the least changed of the river corridors associated with John Wesley Powell and the exploration of the Green and Colorado Rivers. Other historic values are associated with settlement, farming/ranching, mining, prohibition, recreational river running, waterworks and reclamation. Sites have been largely isolated and therefore retain their original character. **Recreation** A trip though Desolation and Gray Canyons of the Green River, consecutive canyons within the Tavaputs Plateau, is a premier, wilderness recreation experience. The 84-mile trip from Sand Wash to Swasey's Beach is world renown. Located in Utah's deepest canyon and largest WSA, Desolation and Gray Canyons offer outstanding white water boating with approximately 60 rapids and riffles. There is also ample opportunity for land-based activity like hiking in the more than 60 side canyons. The BLM receives over 3,000 applications per year for the 450 available trip permits issued to self-outfitted users. Eighteen commercial outfitters market trips through these canyons both nationally and internationally. **Scenic** At over one mile deep, Desolation Canyon is Utah's deepest canyon, cutting through the youngest exposed strata on the Colorado Plateau. Desolation and Gray Canyons consist of complexes of many canyons draining to the Green River. Outstanding scenic values are dictated primarily by the domination of geologic features. In addition to canyon walls rising thousands of feet, there are also many interesting rock formations such as arches and hoodoos. Though the landscape is mostly dry and austere, pleasing contrasts are found in the green ribbon of life along the river, as well as the hanging gardens and pockets of huge fir trees scattered within the cliffs. **Geology** These segments of the Green River offer an outstanding example of an antecedent river cutting through structural geology that should have been impassable to it. As the land surface rises towards the south, the Green River continues to flow to the south and hence decreases in elevation despite the trend of the surrounding landscape. This results in the deepest canyon in Utah, Desolation Canyon. The corridor of the

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
	Green in this stretch also provides the region's best examples of reattachment bars and separation bars formed by the processes of fluvial geomorphology in bedrock canyons. **Fish** This portion of the Green River provides habitat for four Federally listed fish species: Colorado Pikeminnow, Humpback Chub, Bonytail Chub, and Razorback Sucker. Of notable significance, this river contains designated critical habitat for the pikeminnow. Spawning areas for this species have been confirmed within this river, which is also considered important for young of the year pikeminnows. Known populations of Humpback Chub and Razorback Sucker have been confirmed within this river, while Bonytail Chubs are suspected to occur. This river is considered regionally important for the recovery of these four Federally listed species. **Wildlife** This portion of the Green River is considered to have remarkable value for both avian and terrestrial wildlife populations. With regard to avian species, this river corridor is regionally significant, both for its diversity of avian species and for supporting habitats for Federally listed and BLM sensitive avian species. Confirmed Federally listed species present include Bald Eagle, Mexican Spotted Owl and Southwestern Willow Flycatcher. BLM sensitive species known to occur include Peregrine Falcon, Yellow-breasted Chat, Yellow-billed Cuckoo. The river corridor is presently used by Bald Eagles during the winter, but is also considered potential nesting habitat. Mexican Spotted Owl have been verified nesting within this river corridor. The corridor, designated critical habitat for Mexican Spotted Owl, is believed to be significant for their expansion. The Green River segment is also important for Rocky Mountain Bighorn Sheep, mule deer and elk. The entire corridor is regionally significant as lambing habitat for the Rocky Mountain bighorn and considered important winter range for mule deer and elk. **Ecological** The Green River hosts a variety of avian, terrestrial, and aquatic species populations. The river and its properly functioning riparian area provide a corridor of habitat through an otherwise arid region for many sensitive and Federally listed species of birds and fish, as well as populations of bighorn sheep, deer, elk, black bear, mountain lion, and beaver. The corridor supports rare plant species including a recently discovered species of columbine. The stability of this ecosystem, largely unchanged from the passage of John Wesley Powell, contributed to the designation of Desolation Canyon National Historic Landmark.
Green River: Labyrinth Canyon **Segment (4a): Mile 97 (confluence of San Rafael**	**Cultural** This area has evidence of significant occupation and use by prehistoric peoples and includes some of the area of study used by Noel Morss in definition of the Fremont Culture. Its rock art and other features remain significant to some Native American populations today. The prehistoric use represent more than one cultural period (Archaic, Fremont and

Attachment 1: Outstandingly Remarkable Values Of Suitable Rivers

River/Segment Name and Other Information	Description Of Values Present
River to Canyonlands National Park Boundary **Classification:** Scenic **Total River Miles:** Segment (4a): 72 **Reason for Free-flowing Determination:** Natural Flow	Numic). The sites have been largely isolated and retain integrity and are important for interpreting regional prehistory. Many sites are eligible for the National Register of Historic Places. **Recreation** Labyrinth Canyon of the Green River is approximately 68 miles in length. The character of this canyon is completely different from that of Desolation Canyon. This stretch of river has no rapids, making it an excellent experience for canoe paddlers of all abilities. It provides a four to seven day backcountry paddling experience. There are also great opportunities for dispersed camping and hiking to cultural sites, unique geologic features and other attractions. Approximately 7,000 people per year enjoy this popular trip. The section is also suitable for powerboat use at some water levels and provides for much of the annual Friendship Cruise route, a decades-long running powerboat event. This section of the Green River has been widely reported on in newspapers from coast to coast as well as in specialty publications such as Paddler Magazine. **Scenic** Scenic values are largely a product of the geology. The Green River meanders through a deeply incised canyon. Explorer John Wesley Powell named the canyon for its many intricate twists and turns. At Bowknot Bend, one travels a distance of seven river miles to end up within a quarter mile of one's start. Varnished cliffs are cut in places by the narrow mouths of shaded side canyons where mature cottonwood trees are harbored. In the lower parts of the canyon, vertical cliffs of Wingate sandstone rise 1,000 feet above the river. **Fish** This portion of the Green River provides habitat for four endangered fish: the Colorado Pikeminnow, Humpback Chub, Bonytail Chub, and Razorback Sucker. The Green River provides spawning habitat for the Colorado Pikeminnow. The river contains critical habitat as designated by U.S. Fish and Wildlife Service for these species. **Paleontology** Fossilized dinosaur bones visible in Morrison Formation outcrop have been reported by reliable sources (Dr. Paul Bybee, geology professor at Utah Valley State College in Orem, UT). These fossils are visible from the river.

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APPENDIX Q.

CONSERVATION MEASURES FOR T & E SPECIES OF UTAH FROM THE USE PLAN PROGRAMMATIC BAS AND SECTION 7 CONSULTATIONS

As part of the Approved RMP, the BLM has included conservation measures to minimize or eliminate adverse impacts to federally listed species. The species known to currently inhabit the Moab planning area are: Mexican spotted owl, southwestern willow flycatcher, *Jones cycladenia*, and the four Colorado river fishes. The bald eagle is no longer a federally listed species; however, conservation measures to ensure the species' protection during the required monitoring period following delisting are included here. These measures are listed by species:

Q.1

BALD EAGLE (*HALIAEETUS LEUCOCEPHALUS*) CONSERVATION MEASURES

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Bald eagle (*Haliaeetus leucocephalus*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the Service.

1. BLM will place restrictions on all authorized (i.e., permitted) activities that may adversely impact bald eagles, their breeding habitat, roosting sites, and known winter concentration areas, in order to avoid or minimize potential impacts.

Measures have been adapted from guidance published in the Utah Field Office Guidelines for Raptor Protection from Human and Land-use Disturbances (USFWS 2002), as well as coordination between BLM and the Service. Measures include, but may not be limited to seasonal/daily timing limitations, and/or spatial buffers as follows:

-Temporary activities[1] or habitat alterations that may disturb nesting bald eagles will be restricted from January 1st, to August 31st within 1.0 mile of Bald eagle nest sites. Exceptions may be granted where no nesting behavior is initiated prior to June 1st.

-Temporary activities or habitat alterations that may disturb bald eagles will be restricted within 0.5 mile of known winter concentration areas from November 1st to March 31st. Additionally, where daily activities must occur within these spatial buffers, and are approved through subsequent consultation, activities should be properly scheduled to occur after 9 a.m. and terminate at least one hour before official sunset to ensure that bald eagles using these roosts are allowed the opportunity to vacate their roost in the morning and return undisturbed in the evening.

[1] Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss.

-No permanent[2] infrastructure will be placed within 1.0 mile of bald eagle nest sites or within 0.5 mile of bald eagle winter concentration areas.

-Where activities are authorized within breeding habitats or known winter concentration areas, monitoring efforts would document what, if any, impacts occur during project implementation, and to what extent the species was affected. The results of these monitoring efforts would be carried forward in the design and implementation of future projects as part of the adaptive management process.

2. For all project-related survey and monitoring actions:

   -Reports must be provided to affected field offices within 15 days of completion of survey or monitoring efforts. Reports must follow field office guidance for BLM-specified formats for written and automated databases.

   -Any detection of bald eagle presence during survey or monitoring efforts must be reported to the authorized officer within 48 hours of detection.

3. Appropriately timed surveys in suitable bald eagle nesting habitat or identified concentration areas shall be conducted in accordance with approved protocols prior to any activities that may disturb bald eagles. Surveys would only be conducted by BLM-approved individuals or personnel.
4. BLM shall in coordination with cooperating agencies and/or partners (e.g., UDWR, Service, etc.), verify annual status (active vs. inactive) of all known bald eagle nests, and other identified concentration areas on BLM administered lands.
5. When project proposals that may affect threatened and endangered species are received, BLM will coordinate with the Service at the earliest possible date so that the Service can provide necessary information to minimize, or avoid, the need to redesign projects at a later date to include conservation measures that may be determined as appropriate by the Service.
6. BLM administered lands within 1.0 mile of bald eagle nests, or identified communal winter roosts, should not be exchanged or sold. If it is imperative that these lands be transferred out of BLM ownership, then every effort should be made to include conservation easements or voluntary conservation restrictions to protect the bald eagles and support their conservation.
7. Proponents of BLM authorized actions will be advised that roadside carrion can attract foraging bald eagles and potentially increase the risk of vehicle collisions with individuals feeding on carrion. When carrion occurs on the road, appropriate officials will be notified for necessary removal.
8. Power lines will be built to standards and guidelines identified by the Avian Protection Plan (APP) Guidelines (APLIC and USFWS 2005).
9. BLM will make educational information available to project proponents and the general public pertaining to the following topics:

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[2] Permanent activities continue for more than one breeding season and/or cause a loss of habitat or displace individuals through disturbance (e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, electrical power line).

-appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife;

-use of lead shot (particularly over water bodies);

-use of lead fishing weights; and

-general ecological awareness of habitat disturbance.

10. Since bald eagles are often dependent on aquatic species as prey items, BLM will periodically review existing water quality records (e.g., UDEQ, UDWR, USGS) from monitoring stations on, or near, important bald eagle habitats (i.e., nests, roost, concentration areas) on BLM lands for any conditions that could adversely affect bald eagles or their prey. If water quality problems are identified, BLM will contact the appropriate jurisdictional entity to cooperatively monitor the condition and/or take corrective action.

Q. 2
MEXICAN SPOTTED OWL (*STRIX OCCIDENTALIS LUCIDA*) CONSERVATION MEASURES

The following list of measures provides species-specific guidance, intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Mexican spotted owl (*Strix occidentalis lucida*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the Service.

1. BLM will place restrictions on all authorized (permitted) activities that may adversely affect the Mexican spotted owl in identified PACs, breeding habitat, or designated critical habitat, to reduce the potential for adverse impacts to the species. Restrictions and procedures have been adapted from guidance published in the Utah Field Office Guidelines for Raptor Protection from Human and Land-use Disturbances (USFWS 2002b), as well as coordination between BLM and the Service. Measures include:

   -Surveys, according to USFWS protocol, will be required prior to any disturbance related activities that have been identified to have the potential to impact Mexican spotted owl, unless current species occupancy and distribution information is complete and available. All surveys must be conducted by USFWS certified individuals, and approved by the BLM authorized officer.

   -Assess habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the appropriate conservation measures below if project activities occur within 0.5 mile of suitable owl habitat, dependent in part on if the action is temporary (3) or permanent (4):

(3) Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss.

For all temporary actions that may impact owls or suitable habitat:

-If action occurs entirely outside of the owl breeding season, and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey.

-If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season.

-Eliminate access routes created by a project through such means as raking out scars, revegetation, gating access points, etc.

For all permanent actions that may impact owls or suitable habitat:

-Survey two consecutive years for owls according to established protocol prior to commencing of activity.

-If owls are found, no actions will occur within 0.5 mile of identified nest site.

-If nest site is unknown, no activity will occur within the designated Protected Activity Center (PAC).

-Avoid placing permanent structures within 0.5 mi of suitable habitat unless surveyed and not occupied.

-Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 dBA at 0.5 mile from suitable habitat, including canyon rims (Delaney et al. 1997). Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5 mile buffer for suitable habitat, including canyon rims.

-Limit disturbances to and within suitable owl habitat by staying on designated routes.

-Limit new access routes created by the project.

2. BLM will, as a condition of approval (COA) on any project proposed within identified PACs, designated critical habitat, or within spatial buffers for Mexican spotted owl nests (0.5 mile), ensure that project proponents are notified as to their responsibilities for rehabilitation of temporary access routes and other temporary surface disturbances, created by their project, according to individual BLM Field Office standards and procedures, or those determined in the project-specific Section 7 Consultation.
3. BLM will require monitoring of activities in designated critical habitat, identified PACs, or breeding habitats, wherein it has been determined that there is a potential for take. If any adverse impacts are observed to occur in a manner, or to an extent that was not considered in the project-specific Section 7 Consultation, then consultation must be reinitiated.

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(4) Permanent activities continue for more than one breeding season and/or cause a loss of owl habitat or displaces owls through disturbances, e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, electrical power line.

-Monitoring results should document what, if any, impacts to individuals or habitat occur during project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization, or mitigation measures. Monitoring results would be considered an opportunity for adaptive management, and as such, would be carried forward in the design and implementation of future projects.

4. For all survey and monitoring actions:

   -Reports must be provided to affected field offices within 15 days of completion of survey or monitoring efforts.

   -Report any detection of Mexican spotted owls during survey or monitoring to the authorized officer within 48 hours.

5. BLM will, in areas of designated critical habitat, ensure that any physical or biological factors (i.e., the primary constituent elements), as identified in determining and designating such habitat, remains intact during implementation of any BLM-authorized activity.
6. For all BLM actions that "may adversely affect" the primary constituent elements in any suitable Mexican spotted owl habitat, BLM will implement measures as appropriate to minimize habitat loss or fragmentation, including rehabilitation of access routes created by the project through such means as raking out scars, revegetation, gating access points, etc.
7. Where technically and economically feasible, use directional drilling from single drilling pads to reduce surface disturbance, and minimize or eliminate needing to drilling in canyon habitats suitable for Mexican spotted owl nesting.
8. Prior to surface-disturbing activities in Mexican spotted owl PACs, breeding habitats, or designated critical habitat, specific principles should be considered to control erosion. These principles include:

   -Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.

   -Avoid surface disturbance in areas with high erosion hazards to the greatest extent possible. Avoid mid-slope locations, headwalls at the source of tributary drainages, inner valley gorges, and excessively wet slopes such as those near springs. In addition, avoid areas where large cuts and fills would be required.

   -Locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.

9. Project developments should be designed, and located to avoid direct or indirect loss or modification of Mexican spotted owl nesting and/or identified roosting habitats.
10. Water production associated with BLM authorized actions should be managed to ensure maintenance or enhancement of riparian habitats.

Q. 3
SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRAILLII EXTIMUS*) CONSERVATION MEASURES

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Southwestern willow flycatcher (*Empidonax traillii extimus*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Surveys will be required prior to operations that "may adversely affect" the Southwestern willow flycatcher unless species occupancy data and distribution information is complete and available. Surveys will only be conducted by BLM-approved personnel. In the event species occurrence is verified, project proponents may be required to modify operational plans at the discretion of the authorized officer. Modifications may include appropriate measures for minimization of adverse effects to the Southwestern willow flycatcher and its habitat.
2. BLM will monitor and restrict, when and where necessary, authorized or casual use activities that "may adversely affect" the Southwestern willow flycatcher, including but not limited to, recreation, mining, and oil and gas activities. Monitoring results should be considered in the design and implementation of future projects.
3. To monitor the impacts of BLM-authorized projects determined "likely to adversely affect" the Southwestern willow flycatcher, BLM should prepare a short report describing progress, including success of implementation of all associated mitigation. Reports shall be submitted annually to the USFWS Utah Field Office by March 1st beginning one full year from date of implementation of the proposed action. The report shall list and describe the following items:

   -When, or if, the level of anticipated take (as allowed by separate Incidental Take Statements from site- Any unforeseen adverse effects resulting from activities of each site-specific project (may also require reinitiation of formal Consultation);

   -When, and if, any level of anticipated incidental take is approached (as allowed by separate Incidental Take Statements of site-specific Formal Section 7 Consultation efforts);

   -specific formal consultations) is exceeded; and

   -Results of annual, periodic monitoring which evaluate the effectiveness of the reasonable and prudent measures or terms and conditions of the site-specific Consultation.
4. BLM should avoid granting activity permits or authorizing development actions in Southwestern willow flycatcher habitat. Unoccupied potential habitat should be protected in order to preserve them for future management actions associated with the recovery of the Southwestern willow flycatcher.
5. BLM will ensure project design incorporates measures to avoid direct disturbance to populations and suitable habitats where possible. At a minimum, project designs should

include consideration of water flows, slope, seasonal and spatial buffers, possible fencing, and pre-activity flagging of critical areas for avoidance.

6. The BLM will continue to address illegal and unauthorized OHV use and activity upon BLM administered lands. In order to protect, conserve, and recover the Southwestern willow flycatcher in areas of heavy unauthorized use, temporary closures, or use restrictions beyond those which are already in place, may be imposed. As funding allows, BLM should complete a comprehensive assessment of all OHV use areas that interface with Southwestern willow flycatcher populations. Comparison of Southwestern willow flycatcher populations and OHV use areas using GIS would give BLM personnel another tool to manage and/or minimize impacts.
7. All surface-disturbing activities should be restricted within a 0.25 mile buffer from suitable riparian habitats and permanent surface disturbances should be avoided within 0.5 mile of suitable Southwestern willow flycatcher habitat.

   -Unavoidable ground disturbing activities in occupied Southwestern willow flycatcher habitat should only be conducted when preceded by current year survey, should only occur between August 16 and April 30 (the period when Southwestern willow flycatcher are not likely to be breeding), and should be monitored to ensure that adverse impacts to Southwestern willow flycatcher are minimized or avoided, and to document the success of project specific mitigation/protection measures. As monitoring is relatively undefined, project specific requirements must be identified.
8. BLM will properly consider nesting periods for Southwestern willow flycatcher when conducting horse gathering operations in the vicinity of habitat.
9. BLM will ensure that plans for water extraction and disposal are designed to avoid changes in the hydrologic regime that would likely result in loss or undue degradation of riparian habitat.
10. Native species will be preferred over non-native for revegetation of habitat in disturbed areas.
11. BLM will coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact the Southwestern willow flycatcher and its habitats.
12. Limit disturbances to within suitable habitat by staying on designated routes.
13. Ground-disturbing activities will require monitoring throughout the duration of the project to ensure that adverse impacts to Southwestern willow flycatcher are avoided. Monitoring results should document what, if any, impacts to individuals or habitat occur during project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization or mitigation measures. Monitoring results would be considered an opportunity for adaptive management and, as such, would be carried forward in the design and implementation of future projects.
14. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in Southwestern willow flycatcher habitat.

15. Habitat disturbances (i.e., organized recreational activities requiring special use permits, drilling activities, etc.) will be avoided within 0.25 mile of suitable Southwestern willow flycatcher habitat from May 1 to August 15.

Grazing allotments that contain habitat for the species will be managed with consideration for recommendations provided by the Southwestern Willow Flycatcher Recovery Plan, and other applicable research.

Q. 4

JONES *CYCLADENIA* (*CYCLADENIA HUMILIS* VAR. *JONESII*) CONSERVATION MEASURES

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Jones *cycladenia* (*Cycladenia humilis* var. *jonesii*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Prior to surface-disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.
2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not be limited to:

   -the stabilization of soils to minimize or avoid impacts related to soil erosion;

   -marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities; and

   -require project proponents to conduct surveys and monitoring actions using BLM-approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of Jones *cycladenia (Cycladenia humilis* var. *jonesii*) as they are encountered.
4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to populations or individuals where feasible. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.
6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.
7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in

the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.

9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – Special Status Species Management.
11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).

Q.5

COLORADO RIVER ENDANGERED FISHES CONSERVATION MEASURES: BONYTAIL (*GILA ELEGANS*), COLORADO PIKEMINNOW (*PTYCHOCHEILUS LUCIUS*), HUMPBACK CHUB (*GILA CYPHA*), AND RAZORBACK SUCKER (*XYRAUCHEN TEXANUS*)

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Colorado pikeminnow, Humpback chub, bonytail, and razorback sucker, herein referred to as the Colorado River fishes. This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Monitoring of impacts of site-specific projects authorized by the BLM will result in the preparation of a report describing the progress of each site-specific project, including implementation of any associated reasonable and prudent measures or reasonable and prudent alternatives. This will be a requirement of project proponents and will be included as a condition of approval (COA) on future proposed actions that have been determined to have the potential for take. Reports will be submitted annually to the USFWS - Utah Field Office, beginning after the first full year of implementation of the project, and shall list and describe:

   -Any unforeseen direct or indirect adverse impacts that result from activities of each site-specific project;

   -Estimated levels of impact or water depletion, in relation to those described in the original project-level Consultation effort, in order to inform the Service of any intentions to reinitiate Section 7 Consultation; and

-Results of annual, periodic monitoring which evaluates the effectiveness of any site-specific terms and conditions that are part of the formal Consultation process. This will include items such as an assessment of whether implementation of each site-specific project is consistent with that described in the BA, and whether the project has complied with terms and conditions.

2. The BLM shall notify the USFWS immediately of any unforeseen impacts detected during project implementation. Any implementation action that may be contributing to the introduction of toxic materials or other causes of fish mortality must be immediately stopped until the situation is remedied. If investigative monitoring efforts demonstrate that the source of fish mortality is not related to the authorized activity, the action may proceed only after notification of USFWS authorities.

3. Unoccupied, suitable habitat areas should be protected in order to preserve them for future management actions associated with the recovery of the Endangered Colorado River Fish, as well as approved reintroduction, or relocation efforts.

-BLM will avoid impacts where feasible, to habitats considered most representative of prime suitable habitat for these species.

-Surface-disturbing activities will be restricted within ¼ mile of the channel centerline of the Colorado, Green, Duchesne, Price, White, and San Rafael Rivers

-Surface-disturbing activities proposed to occur within floodplains or riparian areas will be avoided unless there is no practical alternative or the development would enhance riparian/aquatic values. If activities must occur in these areas, construction will be designed to include mitigation efforts to maintain, restore, and/or improve riparian and aquatic conditions. If conditions could not be maintained, offsite mitigation strategies should be considered.

4. BLM will ensure project proponents are aware that designs must avoid as much direct disturbance to current populations and known habitats as is feasible. Designs should include:

-protections against toxic spills into rivers and floodplains;

-plans for sedimentation reduction;

-minimization of riparian vegetation loss or degradation;

-pre-activity flagging of critical areas for avoidance;

-design of stream-crossings for adequate passage of fish; and

-measures to avoid or minimize impacts on water quality at the 25-year frequency runoff

5. Prior to surface-disturbing activities, specific principles will be considered to control erosion. These principles include:

-Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.

-Avoid, where possible, surface disturbance in areas with high erosion hazards.

-Avoid mid-slope location of drill pads, headwalls at the source of tributary drainages, inner valley gorges, excessively wet slopes such as those near springs and avoid areas where large cuts and fills would be required.

-Design and locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.

6. Where technically and economically feasible, project proponents will use directional drilling or multiple wells from a single pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat. Ensure that such drilling does not intercept or degrade alluvial aquifers. Drilling will not occur within 100 year floodplains that contain listed fish species or their designated critical habitats.
7. The Utah Oil and Gas Pipeline Crossing Guidance (BLM National Science and Technology Center), or other applicable guidance, will be implemented for oil and gas pipeline river/stream crossings.
8. In areas adjacent to 100-year floodplains, particularly in systems prone to flash floods, BLM will analyze the risk for flash floods to impact facilities. Potential techniques may include the use of closed loop drilling and pipeline burial or suspension as necessary to minimize the potential for equipment damage and resultant leaks or spills.
9. Water depletions from any portion of the Upper Colorado River drainage basin above Lake Powell are considered to adversely affect and adversely modify the critical habitat of these endangered fish species. Section 7 consultation will be completed with the Service prior to any such water depletions.
10. Design stream-crossings for adequate passage of fish (if present), minimum impact on water quality, and at a minimum, a 25-year frequency run-off.

OIL AND GAS LEASE NOTICES

Standard terms and conditions (oil and gas lease notices) applicable to all surface-disturbing activities which are required to protect special status species and comply with the endangered species act, are described in full in Appendix A : Stipulations Applicable to Oil and Gas Leasing and Other Surface-disturbing Activities.

Q.6

RESOURCE PROTECTION MEASURES INCORPORATED FROM THE UTAH LAND-USE PLAN AMENDMENT FOR FIRE AND FUELS MANAGEMENT (UT-USO-04-01)

1. Initiate emergency Section 7 consultation with U.S. Fish and Wildlife Service upon the determination that wildfire suppression may pose a potential threat to any listed threatened or endangered species or adverse modification of designated critical habitat.
2. Prior to planned fire management actions, survey for listed threatened and endangered and non-listed sensitive spies. Initiate Section 7 consultation with U.S. Fish and Wildlife Service as necessary if proposed project may affect any listed species. Review appropriate management, conservation and recovery plans and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in the BLM 6840 Manual. Ensure that any proposed project conserves non-listed sensitive species and their

habitats and ensure that any action authorized, funded or carried out by the BLM does not contribute to the need for any species to become listed.

3. Follow Terms and Conditions identified in the Biological Opinion accompanying the Utah Land-use Plan Amendment for Fire and Fuels Management

Q.7

Conservation Measures from the Biological Opinion for the Utah BLM Land Use Plans (LUP) Amendments BA and Fire Management Plans (FMP) BAs

Firefighter and public safety is the first priority in every fire management activity. Setting priorities among protecting human communities, community infrastructure, other property and improvements, and natural and cultural resources must be based on the values to be protected, human health and safety, and costs of protection. The Applicant Committed Resource Protection Measures will apply to the species covered in this consultation, unless a threat to human life or property exists.

During the wildfire suppression activities, the Incident Commander has the final decision-making authority for suppression operations and tactics, including implementation of resource protection operations, thereby minimizing or avoiding many effects to federally protected species. However, in the event that measures cannot be implemented during fire suppression operations due to safety concerns, some effects may occur to federally protected species. In these cases, BLM would initiate emergency consultation with the Service for these fire suppression efforts.

Q7.1

Land Use Plan Amendment

The project proponent commits to the following resource protection measures as identified in the March 4, 2005 Biological Assessment. These measures have been developed as part of the proposed action to provide statewide consistency in reducing the effects of fire management activities on listed, proposed, and candidate species and their habitats. Resource protection measures for fire management practices use the following codes to represent which actions fir within each of the measures:

SUP: wildland fire suppression,

WFU: wildland fire use for resource benefit,

RX: prescribed fire,

NF: non-fire fuel treatments,

ESR: Emergency Stabilization and Rehabilitation

Measures designed to protect air quality include:

A-1 Evaluate weather conditions, including wind speed and atmospheric stability, to predict impacts from smoke from prescribed fires and wildland fire uses. Coordinate with Utah Department of Environmental Quality for prescribed fires and wildland fire use (RX, WFU).

A-2 When using chemical fuels reduction methods, follow all label requirements for herbicide application (NF).

Measures designed to protect soil and water quality include:

SW-1 Avoid heavy equipment use on highly erosive soils (soils with low soil loss tolerance), wet or boggy soils and slopes greater than 30%, unless otherwise analyzed and allowed under appropriate NEPA evaluation with implementation of additional erosion control and other soil protection mitigation measures. (SUP, WFU, RX, NF, ESR)

SW-2 There may be situations where high intensity fire will occur on sensitive and erosive soil types during wildland fire, wildland fire use or prescribed fire. If significant areas show evidence of high severity fire, then evaluate area for soil erosion potential and downstream values at risk and implement appropriate or necessary soil stabilization actions such as mulching or seeding to avoid excessive wind and water erosion. (SUP, WFU, RX)

SW-3 Complete necessary rehabilitation on fire lines or other areas of direct soil disturbance, including but not limited to water barring fire lines, covering and mulching fire lines with slash, tilling and/or sub soiling compacted areas, scarification of vehicle tracks, OHV closures, seeding and/or mulching for erosion protection. (SUP, WFU, RX)

SW-4 When using mechanical fuels reduction treatments, limit tractor and heavy equipment use to periods of low soil moisture to reduce the risk of soil compaction. If this is not practical, evaluate sites, post treatment and if necessary, implement appropriate remediation, such as sub soiling, as part of the operation. (NF)

SW-5 Treatments such as chaining, plowing and roller chopping shall be conducted as much as practical on the contour to reduce soil erosion. (NF, ESR)

SW-6 When using chemical fuel reduction treatments follow all label directions, additional mitigations identified in project NEPA evaluation and the Approved Pesticide Use Permit. At a minimum, provide a 100-foot-wide riparian buffer strip for aerial application, 25 feet for vehicle application and 10 feet for hand application. Any deviations must be accordance with the label. Herbicides would be applied to individual plants within 10 feet of water where application is critical. (NF)

SW-7 Avoid heavy equipment in riparian or wetland areas. During fire suppression or wildland fire use, consult a Resource Advisor before using heavy equipment in riparian or wetland areas. (SUP, WFU, RX, NF, ESR)

SW-8 Limit ignition within native riparian or wetland areas. Allow low-intensity fire to burn into riparian areas. (RX)

SW-9 Suppress wildfires consistently with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] water bodies. Do not use retardant within 300 feet of water bodies. (SUP, WFU)

SW-10 Plan and implement projects consistent with compliance strategies for restoring or maintaining the restoration of water quality impaired [303(d) listed] water bodies. Planned activities should take into account the potential impacts on water quality, including increased water yields that can threaten fisheries and aquatic habitat; improvements at channel crossings; channel stability; and downstream values. Of special concern are small headwaters of moderate to steep watersheds, erosive or saline soils; multiple channel crossings; at-risk fisheries, and downstream residents. (RX, NF, ESR)

Measures designed to protect vegetation include:

V-1 When restoring or rehabilitating disturbed rangelands, non-intrusive, non-native plant species are appropriate for use when native species: (1) are not available; (2) are not economically feasible; (3) cannot achieve ecological objectives as well as non-native species; and/or (4) cannot compete with already established native species. (RX, NF, ESR)

V-2 In areas known to have weed infestations, aggressive action should be taken in rehabilitating fire lines, seeding and follow-up monitoring and treatment to reduce the spread of noxious weeds. Monitor burned areas and treat as necessary. All seed used would be tested for purity and for noxious weeds. Seed with noxious weeds would be rejected. (SUP, WFU, RX, NF, ESR)

Measures designed to protect special status species (including threatened and endangered species) include:

SSS-1 Initiate emergency Section 7 consultation with United States Fish and Wildlife Service (Service) upon the determination that wildfire suppression may pose a potential threat to any listed threatened or endangered species or adverse modification of designated critical habitat. (SUP)

SSS-2 Prior to planned fire management actions, survey for listed threatened, endangered, and non-listed sensitive species. Initiate Section 7 consultation with the Service as necessary if a proposed project may affect any listed species. Review appropriate management, conservation and recovery plans and include recovery plan direction into project proposals. For non-listed special status plant and animal species, follow the direction contained in the BLM 6840 Manual. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action authorized, funded, or carried out by BLM does not contribute to the need for any species to become listed. (RX, NF, ESR)

SSS-3 Incorporate site-specific conservation measures identified in this BA. (SUP, WFU, RX, NF, ESR)

Measures designed to protect fish and wildlife resources include:

FW-1 Avoid treatments during nesting, fawning, spawning, or other critical periods for wildlife or fish. (RX, NF, ESR)

FW-2 Avoid if possible or limit the size of, wildland fires in important wildlife habitats such as, mule deer winter range, riparian and occupied sage grouse habitat. Use Resource Advisors to help prioritize resources and develop Wildland Fire Situation Analyses (WFSAs) and Wildland Fire Implementation Analyses (WFSAs) and Wildland Fire Implementation Plans (WFIPs) when important habitats may be impacted. (SUP, WFU)

FW-3 Minimize wildfire size and frequency in sagebrush communities where sage grouse habitat objectives will not be met if a fire occurs. Prioritize wildfire suppression in sagebrush habitat with an understory of invasive, annual species. Retain unburned islands and patches of sagebrush unless there are compelling safety, private property and resource protection or control objectives at risk. Minimize burn out operations (to minimize burned acres) in occupied sage-grouse habitats when there are not threats to human life and/or important resources. (SUP)

FW-4 Establish fuel treatment projects at strategic locations to minimize size of wildfires and to limit further loss of sagebrush. Fuel treatments may include green stripping to help reduce the spread of wildfires into sagebrush communities. (RX, NF)

FW-5 Use wildland fire to meet wildlife objectives. Evaluate impacts to sage grouse habitat in areas where wildland fire use for resource benefit may be implemented. (WFU, RX)

FW-6 Create small openings in continuous or dense sagebrush (>30% canopy cover) to create a mosaic of multiple-age classes and associated understory diversity across the landscape to benefit sagebrush-dependent species. (WFU, RX, NF)

FW-7 On sites that are currently occupied by forests or woodlands, but historically supported sagebrush communities, implement treatments (fire, cutting, chaining, seeding, etc.) to re-establish sagebrush communities. (RX, NF)

FW-8 Evaluate and monitor burned areas and continue management restrictions until the recovering and/or seeded plant community reflect the desired condition. (SUP, WFU, RX, ESR)

FW-9 Utilize the Emergency Stabilization and Rehabilitation program to apply appropriate post fire treatments within crucial wildlife habitats, including sage grouse habitats. Minimize seeding with non-native species that may create a continuous perennial grass cover and restrict establishment of native vegetation. Seed mixtures should be designed to re-establish important seasonal habitat components for sage grouse. Leks should not be re-seeded with plants that change the vegetation heights previously found on the lek. Forbs should be stressed in early and late brood-rearing habitats. In situations of limited funds for emergency stabilization and rehabilitation actions, prioritize rehabilitation of sage grouse habitats. (ESR)

Measures designed to protect wild horses and burros include:

WHB-1 Avoid fencing that would restrict access to water. (RX, NF, ESR)

Measures designed to protect cultural resources include:

CR-1 Cultural Resource Advisors should be contacted when fires occur in areas containing sensitive cultural resources. (SUP)

CR-2 Wildland fire use is discouraged in areas containing sensitive cultural resources. A Programmatic Agreement is being prepared between the Utah State Historic Preservation Office, BLM, and the Advisory Council to cover the finding of adverse effects to cultural resources associated with wildland fire use. (WFU)

CR-3 Potential impacts of proposed treatments should be evaluated for compliance with the National Historic Preservation Act (NHPA) and the Utah Statewide Protocol. This should be conducted prior to the proposed treatment. (RX, NF, ESR)

Measures designed to protect paleontology resources include:

P-1 Planned projects should be consistent with BLM Manual and Handbook H-8270-1, Chapter III (A) and III (B) to avoid areas where significant fossils are known or predicted to occur or to provide for other mitigation of possible adverse effects. (RX, NF, ESR)

P-2 In the event that paleontological resources are discovered in the course of surface fire management activities, including fires suppression, efforts should be made to protect these resources. (SUP, WFU, RX, NF, ESR)

Measures designed to protect forestry resources include:

F-1 Planned projects should be consistent with HFRA Section 102(e)(2) to maintain or contribute to the restoration of old-growth stands to a pre-fire suppression condition and to retain large trees contributing to old-growth structure. (SUP, WFU, RX, NF)

F-2 During planning, evaluate opportunities to utilize forest and woodland products prior to implementing prescribed fire activities. Include opportunities to use forest and woodland stands, consider developing silvicultural prescriptions concurrently with fuel treatments prescriptions. (RX, NF)

Measures designed to protect livestock grazing resources include:

LG-1 Coordinate with permittees regarding the requirements for non-use or rest of treated areas. (SUP, WFU, RX, NF, ESR)

LG-2 Rangelands that have been burned by wildfire, prescribed fire, or wildland fire use, would be ungrazed for a minimum of one complete growing season following the burn. (SUP, WFU, RX)

LG-3 Rangelands that have been re-seeded or otherwise treated to alter vegetation composition, chemically or mechanically, would be ungrazed for a minimum of two complete growing seasons. (RX, NF, ESR)

Measures designed to protect recreation and visitor services include:

Rec-1 Wildland fire suppression efforts would preferentially protect Special Recreation Management Areas and recreation site infrastructure in line with fire management goals and objectives. (SUP)

Rec-2 Vehicle tracks created off of established routes would be obliterated after fire management actions in order to reduce unauthorized OHV travel. (SUP, WFU, RX, NF, ESR)

Measures designed to protect land and reality resources include:

LR-1 Fire management practices would be designed to avoid or otherwise ensure the protection of authorized rights-of-way and other facilities located on the public lands, including coordination with holders of major rights-of-way systems within rights-of-way corridors and communication sites. (WFU, RX, NF, ESR)

LR-2 Fire management actions must not destroy, deface, change or remove to another place any monument or witness tree of the Public Land Survey System. (SUP, WFU, RX, NF, ESR)

Measures designed to minimize impacts confounded by hazardous waste include:

HW-1 Recognize hazardous wastes and move fire personnel to a safe distance from dumped chemicals, unexploded ordnance, drug labs, wire burn sites, or any other hazardous wastes. Immediately notify BLM Field Office hazmat coordinator or state hazmat coordinator upon discovery of any hazardous materials, following the BLM hazardous materials contingency plan. (SUP, WFU, RX, NF, ESR)

Measures designed to protect mineral resources include:

M-1 A safety buffer should be maintained between fire management activities and at-risk facilities. (SUP, WFU, RX)

Measures designed to protect wilderness and wilderness study areas (WSAs) include:

Wild-1 The use of earth-moving equipment must be authorized by the field office manager. (SUP, WFU, RX, ESR)

Wild-2 Fire management actions would rely on the most effective methods of suppression that are least damaging to wilderness values, other resources and the environment, while requiring the least expenditure of public funds. (SUP, WFU)

Wild-3 A Resource Advisor should be consulted when fire occurs in Wilderness and WSAs. (SUP, WFU)

Additional Resource Protection Measures

In addition to the resource protection measures listed in the LUP Amendment and five FMPs, the following conservation measures were developed through the Section 7 (of the ESA) consultation process. The BLM has incorporated these measures into the six Proposed Actions by reference to their BA, and include:

- Manage natural and prescribed Fire Regimes to protect or improve Utah prairie dog habitat.
- Within Utah prairie dog habitat, reseeding would be implemented according to the Utah Prairie Dog Recovery Plan.
- Manage prescribed fire and wildland fire use within Mexican spotted owl Protected Activity Centers (PACs) to ensure protection of nesting, roosting, and foraging habitats.

- Wildland fire suppression would be prioritized for use in Mexican spotted owl PACs. When feasible, fire camps associated with suppression efforts would be built outside of the PACs and nest protection areas.
- For treatments within suitable habitat for listed species, pre- and post-monitoring would take place as determined on a case-by-case basis.
- Incorporate the standards and guidelines recommended by the Inland Native Fish Strategy (USFS 1995)
- As per the decision of the Resource Advisor, avoid construction of fire lines using mechanized equipment across the stream channel. If used, the mechanized equipment would terminate at, and not cross, the stream channel.
- Avoid transferring water from one watershed into another for the purpose of water drops, as this could aid in the spread of water-borne diseases such as whirling disease.
- Avoid retardant use in any riparian/wetland communities.
- Restrict use of mechanical treatments and hand tools.
- Per-burn acreage limitations of 5-100 acres, as long as human life or property are not threatened.
- If the white-tailed prairie dog is listed, initiate emergency Section 7 consultation with the Service upon the determination that wildland fire suppression may pose a potential threat to the species. (SUP)

Prior to planned fire management actions, survey for listed threatened and endangered and non-listed sensitive species. Initiate Section 7 consultation with the Service as necessary if proposed projects may impact the white-tailed prairie dog, if listed. Review appropriate management, conservation, and recovery plans and include recovery plan direction into project proposals, if listed. Until the white-tailed prairie dog is listed, follow the direction contained in the BLM 6840 Manual. Ensure that any proposed project conserves non-listed sensitive species and their habitats and ensure that any action, authorized, funded or carried out by BLM does not contribute to the need for any species to become listed.

Measures Specific to the Moab Fire Region (Moab, Price, and Monticello Field Offices)

Restoration and rehabilitation measures may follow prescribed and non-fire management actions. They would emphasize the re-establishment and perpetuation of habitat diversity and prevention of reduction of invasive weeds species. The short-term objective would be to stabilize soils, reduce potential impacts to values at risk (cultural, watershed, fish and wildlife, and any adjacent private holdings), and prevent the establishment of non-native invasive species. Long-term objectives include further stabilization of sites to assist in the re-establishment of the native vegetation community that existed prior to the disturbance. Restoration and rehabilitation efforts are selectively applied to planned management actions. Emergency stabilization and rehabilitation is a part of wildland fire suppression action and is considered separately from standard restoration and rehabilitation.

APPENDIX R.

BEST MANAGEMENT PRACTICES FOR RAPTORS AND THEIR ASSOCIATED HABITATS IN UTAH

R. 1 INTRODUCTION

Raptors, or *Birds of Prey*, are found on public lands throughout Utah. Approximately 31 species of raptors utilize public lands for at least a portion of their life cycle. These include 20 diurnal raptors, including the eagles, hawks, falcons, osprey, turkey vulture and California condor; and 11 mostly nocturnal owl species. At least 16 of the diurnal raptors are known to nest, roost and forage on public lands; while 2 others are probable nesters within the southern part of the state. The California condor is known to utilize public lands for roosting and foraging, but is not currently known to nest within the state. The rough-legged hawk is a winter resident that uses public lands for foraging. All of the owl species nest, roost and forage on public lands in Utah.

Eight of Utah's raptors are considered to be Special Status Species by the BLM, and currently receive enhanced protection, in addition to the regulatory authority provided by the Migratory Bird Treaty Act (MBTA), which covers all raptor species. The bald eagle and Mexican spotted owl are listed as Federally threatened species and are afforded the protection, as well as the Section 7 consultation requirements, of the Endangered Species Act (ESA). The bald eagle is currently being proposed for delisting by the Fish and Wildlife Service. Both the bald eagle and golden eagle are protected by the provisions of the Eagle Protection Act. The California condor is a Federally endangered species, however, the birds found in southern Utah are part of an Experimental Non-essential Population reintroduced to northern Arizona under Section 10(j) of the Endangered Species Act. The BLM is required to treat the condor as a species proposed for listing for Section 7 purposes of the ESA. The northern goshawk is managed by a multi-agency Conservation Agreement. The ferruginous hawk, short-eared owl and burrowing owl are listed as Wildlife Species of Concern by the Utah Division of Wildlife Resources (UDWR, May 12, 2006), and are therefore recognized as BLM state-sensitive species under the Bureau's 6840 Manual. The BLM's 6840 Policy states that "*BLM shall…ensure that actions authorized, funded, or carried out…do not contribute to the need for the species to become listed"*.

Future raptor management on BLM lands in Utah will be guided by the use of these Best Management Practices (BMPs), which are BLM-specific recommendations for implementation of the U.S. Fish and Wildlife Service, Utah Field Office's *"Guidelines for Raptor Protection From Human and Land Use Disturbances"* (*"Guidelines"*). The *"Guidelines"* were originally developed by the Fish and Wildlife Service in 1999, and were updated during 2002 to reflect changes brought about by court and policy decisions and to incorporate Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds.* The *"Guidelines"* were provided to BLM and other land-managing agencies in an attempt to provide raptor management consistency, while ensuring project compatibility with the biological requirements of raptors, and encouraging an ecosystem approach to habitat management.

These Best Management Practices, or specific elements of the BMP's which pertain to a proposal, should be attached as Conditions of Approval to all BLM use authorizations which

have the potential to adversely affect nesting raptors, or would cause occupied nest sites to become unsuitable for nesting in subsequent years.

Raptor management is a dynamic and evolving science, and consequently, as the science evolves, these BMP's will undergo subsequent revision. As more information becomes available through implementation of these raptor BMP's, and as our knowledge of raptor life cycle requirements increases, findings will be incorporated into future revisions of the BMP document. Additionally, BLM and the Department of Energy are initiating a 3-year Raptor Radii study which will test traditional spatial and seasonal nest buffers during actual oil and gas development activities for a select suite of species. Study results would be incorporated into new BMP revisions as well.

To adequately manage raptors and their habitats, and to reduce the likelihood of a raptor species being listed under the Endangered Species Act (ESA), BLM-authorized or proposed management activities and/or land disturbing actions would be subject to the criteria and processes specified within these BMPs. The implementation of raptor spatial and seasonal buffers under the BMPs would be consistent with Table 2 of the "*Guidelines",* included here as Attachment 2. As specified in the "*Guidelines",* modifications of spatial and seasonal buffers for BLM-authorized actions would be permitted, so long as protection of nesting raptors was ensured. State and/or Federally-listed, proposed, and candidate raptor species, as well as BLM state-sensitive raptor species, should be afforded the highest level of protection through this BMP process; however, all raptor species would continue to receive protection under the Migratory Bird Treaty Act. Modification of the buffers for threatened or endangered species would be considered pending results of Section 7 Consultation with USFWS.

As stated in the "*Guidelines",* spatial and seasonal buffers should be considered as the best available recommendations for protecting nesting raptors under a wide range of activities state-wide. However, they are not necessarily site-specific to proposed projects. Land managers should evaluate the type and duration of the proposed activity, the position of topographic and vegetative features, the sensitivity of the affected species, the habituation of breeding pairs to existing activities in the proposed project area, and the local raptor nesting density, when determining site-specific buffers. The BLM would be encouraged to informally coordinate with UDWR and USFWS anytime a site-specific analysis shows that an action may have an adverse impact on nesting raptors. The coordination would determine if the impact could be avoided or must be mitigated, and if so, to determine appropriate and effective mitigation strategies.

Potential modifications of the spatial and seasonal buffers identified in the *"Guidelines"* may provide a viable management option. Modifications would ensure that nest protection would occur, while allowing various management options which may deviate from the suggested buffers within the *"Guidelines",* which, if adequately monitored, could provide valuable information for incorporation into future management actions.

Seasonal raptor buffers from Attachment 2 should be reviewed by local raptor nesting authorities who are knowledgeable of raptor nesting chronologies within their local area. For those nesting raptors for which local nesting chronologies remain uncertain, the seasonal buffers provided in Attachment 2 should serve as the default. However, for those raptor species whose known nesting chronologies differ from the seasonal buffers provided in Attachment 2, the local seasonal buffers may be utilized as a modification of the "*Guidelines".*

Criteria that would need to be met, prior to implementing modifications to the spatial and seasonal buffers in the "*Guidelines",* would include the following:

1. Completion of a site-specific assessment by a wildlife biologist or other qualified individual. See example (Attachment 1)
2. Written documentation by the BLM Field Office Wildlife Biologist, identifying the proposed modification and affirming that implementation of the proposed modification(s) would not affect nest success or the suitability of the site for future nesting. Modification of the "Guidelines" would not be recommended if it is determined that adverse impacts to nesting raptors would occur or that the suitability of the site for future nesting would be compromised.
3. Development of a monitoring and mitigation strategy by a BLM biologist, or other raptor biologist. Impacts of authorized activities would be documented to determine if the modifications were implemented as described in the environmental documentation or Conditions of Approval, and were adequate to protect the nest site. Should adverse impacts be identified during monitoring of an activity, BLM would follow an appropriate course of action, which may include cessation or modification of activities that would avoid, minimize or mitigate the impact, or, with the approval of DWR and F&WS, BLM could allow the activity to continue while requiring monitoring to determine the full impact of the activity on the affected raptor nest. A monitoring report would be completed and forwarded to UDWR for incorporation into the Natural Heritage Program (NHP) raptor database.

In a further effort to provide additional support and expertise to local BLM Field biologists, a network of biologists from various agencies with specific expertise in raptor management has been identified and included as Attachment 3. The personnel identified have extensive backgrounds in raptor management issues and are available, upon request, to assist BLM Field biologists on a case by case basis. Field biologists are encouraged to use this network, via informal conference, with one or more of the individuals identified. This coordination should be clearly distinguished from the consultation process required under Section 7 of the ESA. Individuals on the expert panel should not be expected to provide formal advise, but should serve as a sounding board for discussing potential affects of a proposal, as well as potential mitigation measures on specific projects which may be useful to BLM biologists.

R.2 HABITAT ENHANCEMENT

As recommended in the "*Guidelines",* raptor habitat management and enhancement, both within and outside of buffers, would be an integral part of these BMPs, with the understanding that in order for raptors to maintain high densities and maximum diversity, it is necessary that the habitat upon which they and their prey species depend be managed to promote healthy and productive ecosystems. Habitat loss or fragmentation would be minimized and/or mitigated to the extent practical and may include such measures as; drilling multiple wellheads per pad, limiting access roads and avoiding loop roads to well pads, effective rehabilitation or restoration of plugged and abandoned well locations and access roads that are no longer required, rehabilitation or restoration of wildland fires to prevent domination by non-native invasive annual species, vegetation treatments and riparian restoration projects to achieve Rangeland Health Standards, etc.

In some cases, artificial nesting structures, located in areas where preferred nesting substrates are limited, but where prey base populations are adequate and human disturbances are limited, may enhance some raptor populations, or may serve as mitigation for impacts occurring in other areas.

R.3 PROTECTION OF NEST SITES AND BUFFER ZONES

As stated in the *"Guidelines"*, protection of both occupied and unoccupied nests is important since not all raptor pairs breed every year, nor do they always utilize the same nest within a nesting territory. Individual raptor nests left unused for a number of years are frequently reoccupied, if all the nesting attributes which originally attracted a nesting pair to a location are still present. Nest sites are selected by breeding pairs for the preferred habitat attributes provided by that location.

Raptor nest buffer zones are established for planning purposes because the nest serves as the focal point for a nesting pair of raptors. The buffer should serve as a threshold of potential adverse affect to nest initiation and productivity. Actions proposed within these buffer zones are considered potentially impacting and, therefore, trigger the need for consideration of site-specific recommendations.

Seasonal (temporal) buffer zones are conservation measures intended to schedule potentially impacting activities to periods outside of the nesting season for a particular raptor species. These seasonal limitations are particularly applicable to actions proposed within the spatial buffer zone of a nest for short duration activities such as, pipeline or powerline construction, seismic exploration activity, vegetative treatments, fence or reservoir construction, permitted recreational events, etc., where subsequent human activity would not be expected to occur.

Spatial buffer zones are those physical areas around raptor nest sites where seasonal conservation measures, or surface occupancy restrictions may be applied, depending on the type and duration of activity, distance and visibility of the activity from the nest site, adaptability of the raptor species to disturbance, etc. Surface occupancy restrictions should be utilized for actions which would involve human activities within the buffer zone for a long duration (more than one nesting season) and which would cause an occupied nest site to become unsuitable for nesting in subsequent years.

R.3.1. UNOCCUPIED NESTS

All Activities, including All Mineral Leases: Surface-disturbing activities, occurring outside of the breeding season (seasonal buffer), but within the spatial buffer, would be allowed during a minimum three-year nest monitoring period, as long as the activity would not cause the nest site to become unsuitable for future nesting, as determined by a wildlife biologist. Facilities and other permanent structures would be allowed, if they meet the above criteria.

Some examples of typical surface disturbing actions, occurring outside of the seasonal buffer, which may not be expected to affect nest production or future nesting suitability, would include; pipelines, powerlines, seismographic exploration, communication sites, an oil or gas well with off-site facilities which does not require routine visitation, recreation events, fence or reservoir construction, vegetative treatments, and other actions with discreet starting and ending times, and for which subsequent human activity or heavy equipment operation within the spatial buffer

would not be expected to occur, or could be scheduled outside of the seasonal buffer in subsequent years.

Surface disturbing activities that would be expected to potentially affect nest production or nest site suitability, include; oil and gas facilities requiring regular maintenance, sand and gravel operations, road systems, wind energy projects, mining operations, and other actions requiring continual, random human activity, or heavy equipment operation during subsequent nesting seasons.

A nest site which does not exhibit evidence of use, such as; greenery in the nest, fresh whitewash, obvious nest maintenance or the observed presence of adults or young at the nest, for a period of three consecutive years, (verified through monitoring), would be deemed abandoned and all seasonal and spatial restrictions would cease to apply to that nest. All subsequent authorizations for permanent activities within the spatial buffer of the nest could be permitted. If the nest becomes reoccupied after authorized activities are completed, conservation measures would be considered to reduce potential adverse affects and to comply with the Migratory Bird Treaty Act and the Eagle Protection Act.

The three-year non-use standard varies from the "*Guidelines*" suggested seven-year non-use standard before declaring nest abandonment. This variation is based upon a similar standard which has been applied for over 20 years in two administrative areas within Utah. Empirical evidence would suggest the three-year non-use standard has been effective in conserving raptor species. The three-year standard has been applied without legal challenge or violation of "Take" under the Migratory Bird Treaty Act or the Eagle Protection Act.

Because prey base populations are known to be cyclic, and because raptor nest initiation or nesting success can be affected by drought and other random natural events, care should be taken when applying the 3-year non-activity standard. The 3-year nest occupancy monitoring requirement should be viewed as a minimum time period during those years of optimal raptor nesting conditions. During sub-optimal raptor nesting years, when nesting habitat may be affected by drought, low prey base populations, fire, or other events, the monitoring standard should be increased to allow raptors the opportunity to reoccupy nesting sites when nesting conditions become more favorable.

R.3.2. OCCUPIED NESTS

All Activities: Land use activities which would have an adverse impact on an occupied raptor nest, would not be allowed within the spatial or seasonal buffer.

R.4 CONSIDERATION OF ALTERNATIVES AND MITIGATION MEASURES

Alternatives, including denial of the proposal, should be identified, considered and analyzed in a NEPA document anytime an action is proposed within the spatial buffer zone of a raptor nest. Selection of a viable alternative that avoids an impact to nesting raptors should be selected over attempting to mitigate those impacts. If unavoidable impacts are identified, mitigation measures should be applied as necessary to mitigate adverse impacts of resource uses and development on nesting raptors. Monitoring of the effectiveness of the mitigation measures should be mandatory and should be included as a Condition of Approval.

R.5 SPECIFIC STRATEGIES TO BE IMPLEMENTED REGARDING OTHER RESOURCE USES

The following are management strategies designed to reduce or eliminate potential conflicts between raptors and other resource uses. This is a list of examples and is not intended to be an all-inclusive list. In all cases, when an activity on BLM lands is proposed, and a NEPA document developed, the site-specific analysis process identified in Attachment 1 may be implemented to identify and either avoid or mitigate impacts to raptors from the proposal. These strategies apply to both BLM and applicant-generated proposals. The strategies are as follows:

R.5.1 CULTURAL RESOURCES

Excavation and studies of cultural resources in caves and around cliff areas should be delayed until a qualified biologist surveys the area to be disturbed or impacted by the activity for the presence of raptors or nest sites. If nesting raptors are present, the project should be rescheduled to occur outside of the seasonal buffer recommended by the *"Guidelines"*.

R.5.2 FORESTRY AND HARVEST OF WOODLAND PRODUCTS

Timber harvest would be subject to NEPA analysis and would be conducted in a manner that would avoid impacts to raptor nests. This could also apply to areas identified for wood gathering and firewood sales.

R.5.3 HAZARDOUS FUEL REDUCTION/HABITAT RESTORATION PROJECTS

Hazardous fuels reduction projects and shrub-steppe restoration projects should be reviewed for possible impacts to nesting raptors. Removal of trees containing either stick nests or nesting cavities, through prescribed fire, or mechanical or manual treatments, should be avoided.

It is important to note that certain raptor species are tied to specific habitat types, and that consideration must be made on a site-specific basis when vegetation manipulation projects are proposed, to determine which raptor species may benefit and which may be negatively affected by the vegetation composition post-treatment.

R.5.4 LIVESTOCK GRAZING

Manage rangelands and riparian areas in a manner that promotes healthy, productive rangelands and functional riparian systems. Rangeland Health Assessments should be conducted on each grazing allotment, and rangeland guidelines should be implemented where Rangeland Health Standards are not being met, to promote healthy rangelands.

Locations of sheep camps and other temporary intrusions would be located in areas away from raptor nest sites during the nesting season. Placement of salt and mineral blocks would also be located away from nesting areas.

Season of use, kind of livestock, and target utilization levels of key species affect vegetative community attributes (percent cover, composition, etc.) and influence small mammal and avian species diversity and density. While not all raptor species would be affected in the same way, livestock management practices which maintain or enhance vegetative attributes, will preserve prey species density and diversity which will benefit the raptor resource.

R.5.5 OHV USE

Special Recreation Management Areas (SRMAs) that are developed for OHV use would not be located in areas that have important nesting, roosting, or foraging habitat for raptors.

Off highway vehicle use would be limited to designated roads, trails and managed open areas. Lands categorized as "Open" for OHV use should not be in areas important to raptors for nesting, roosting, and foraging

When proposals for OHV events are received, the area to be impacted, would be surveyed by a qualified wildlife biologist to determine if the area is utilized by raptors. Potential conflicts would be identified and either avoided or mitigated prior to the issuance of any permit.

R.5.6 OIL AND GAS DEVELOPMENT

The Code of Federal Regulations (CFR), 43 CFR 3101.1-2, allows for well site location and timing to be modified from that requested by the lessee to mitigate conflicts at the proposed site, and states that the location can be moved up to 200 meters and the timing of the actual drilling can be delayed for up to 60 days to mitigate environmental concerns. The regulation also allows BLM to move a location more than 200 meters, or delay operations more than 60 days to protect sensitive resources, with supporting rationale and where lesser restrictions are ineffective. The Site Specific Analysis (Attachment 1) would provide the supporting rationale. Provisions are also present within Sections 3 and 6 of the Standard Lease Form which require compliance with existing laws and would allow the BLM to impose additional restrictions at the permitting phase, if the restrictions will prevent violation of law, policy or regulation, or avoid undue and unnecessary degradation of lands or resources.

R.5.7 REALTY

Lands proposed for disposal which includes raptor nesting, roosting, or important foraging areas would be analyzed and evaluated for the relative significance of these resources before a decision is made for disposal or retention.

A priority list of important raptor habitat areas, especially for Federally listed or state sensitive raptor species, on state and private lands should be developed and utilized as lands to be acquired by BLM when opportunities arise to exchange or otherwise acquire lands.

Lands and realty authorizations would include appropriate conservation measures to avoid and/or mitigate impacts to raptors.

R.5.8 RECREATION

Development of biking trails near raptor nesting areas would be avoided.

Rock climbing activities would be authorized only in areas where there are no conflicts with cliff nesting raptors.

In high recreation use areas where raptor nest sites have been made unsuitable by existing disturbance or habitat alteration, mitigation should be considered to replace nest sites with artificial nest structures in nearby suitable habitat, if it exists, and consider seasonal protection of nest sites through fencing or other restrictions.

Dispersed recreation would be monitored to identify where this use may be impacting nesting success of raptors.

R.6 INVENTORY AND MONITORING

- Each Field Office should cooperatively manage a raptor database, with UDWR and USFWS, as part of the BLM Corporate database. Raptor data should be collected and compiled utilizing the Utah Raptor Data Collection Standards developed by the Utah State Office, so that personnel from other agencies can access the data. Appropriate protocols for survey and monitoring should be followed, when available. This database should be updated as new inventory and monitoring data becomes available. The data should also be forwarded to UDWR and the Natural Heritage Program, which has been identified as the central repository for raptor data storage for the State of Utah.
- Use of Seasonal Employees and volunteers, as well as "Challenge Cost Share" projects, should be utilized to augment the inventory and monitoring of raptor nests within a planning area, with the data entered into the above-mentioned databases at the close of each nesting season. Project proponents, such as energy development interests, would be encouraged to participate and help support an annual raptor nest monitoring effort within their areas of interest.
- Active nest sites should be monitored during all authorized activities that may have an impact on the behavior or survival of the raptors at the nest site. A qualified biologist would conduct the monitoring and document the impacts of the activity on the species. A final report of the impacts of the project should be placed in the EA file, with a copy submitted to the NHP. The report would be made available for review and should identify what activities may affect raptor-nesting success, and should be used to recommend appropriate buffer zones for various raptor species.
- As data are gathered, and impact analyses are more accurately documented, "adaptive management" principles should be implemented. Authorization of future activities should take new information into account, better protecting raptors, while potentially allowing more development and fewer restrictions, if data indicates that current restrictions are beyond those necessary to protect nesting raptors, or conversely indicates that current guidance is inadequate for protection of nesting raptors.

ATTACHMENT 1

Site Specific Analysis Data Sheet

Observer(s) _____ **Date**_____

1. Conduct a site visit to the area of the proposed action and complete the raptor nest site data sheet according to BLM data standards.

2. Area of Interest Documentation (**Bold** items require completion, other information is optional)

State_____ **Office** _____ **Management Unit** _____

Project ID# _____

Location (Description)

Legal T_____, R ____, Sec. ___, 1/4, ___ 1/4, ____ or UTM Coordinates

Latitude_____Longitude_____

Photos Taken Y( ) N( )

Description of photos:

_____

_____

_____

_____

_____

_____

Raptor Species_____ Confirmed _____ Unconfirmed _____

Distance From Proposed Disturbance to: **Nest** _____
Perch _____
Roost _____

Line of Site Evaluation From: **Nest** _____
Perch _____
Roost _____

Extent of Disturbance: Permanent _____ Temporary _____
Distance from Nest/Roost _____ Acreage _____

Length of Time_____Timing Variations_____ Disturbance Frequency_____

Other Disturbance Factors: Yes No (If yes, explain what and include distances from nest to disturbances)

Approximate Age of Nest: New____ **Historical**: (Number of Years)____

Evidence of Use (Describe):

Habitat Values Impacted:

Proportion of Habitat Impacted (Relate in terms of habitat available):

Estimated Noise Levels of Project (db):_____

Available Alternative(s) (e.g., location, season, technology):

Associated Activities:

Cumulative Effects of Proposal and Other Actions in Habitat Not Associated With the Proposal:

Potential for site Rehabilitation: High_____ Low_____

Notes/Comments:

Summary of Proposed Modifications:
Possible modifications to the spatial and seasonal buffers within the FWS *"Guidelines"* include the following:

Rationale:

Summary of Proposed Mitigation Measures:
Possible mitigation measures related to the proposal include the following:

Rationale:

Summary of Alternatives Considered:
Possible alternatives to the proposal include the following:

Rationale:

Recommendation to FO Manager Based on Above Findings:

Field Office Wildlife Biologist Date

ATTACHMENT 2 - NESTING PERIODS AND RECOMMENDED BUFFERS FOR RAPTORS IN UTAH

Attachment 2 - Nesting periods and recommended buffers for raptors in Utah						
Species	**Spatial Buffer (miles)**	**Seasonal Buffer**	**Incubation, # Days**	**Brooding, # Days Post-Hatch**	**Fledging, # Days Post-Hatch**	**Post-fledge Dependency to Nest, # Days[1]**
Bald eagle	1.0	1/1-8/31	34-36	21-28	70-80	14-20
Golden eagle	0.5	1/1-8/31	43-45	30-40	66-75	14-20
N. Goshawk	0.5	3/1-8/15	36-38	20-22	34-41	20-22
N. Harrier	0.5	4/1-8/15	32-38	21-28	42	7
Cooper's hawk	0.5	3/15-8/31	32-36	14	27-34	10
Ferruginous hawk	0.5	3/1-8/1	32-33	21	38-48	7-10
Red-tailed hawk	0.5	3/15-8/15	30-35	35	45-46	14-18
Sharp-shinned hawk	0.5	3/15-8/31	32-35	15	24-27	12-16
Swainson's hawk	0.5	3/1-8/31	33-36	20	36-40	14
Turkey vulture	0.5	5/1-8/15	38-41	14	63-88	10-12
California condor	1.0	NN yet	56-58	5-8 weeks	5-6 months	2 months
Peregrine falcon	1.0	2/1-8/31	33-35	14-21	35-49	21
Prairie falcon	0.25	4/1-8/31	29-33	28	35-42	7-14
Merlin	0.5	4/1-8/31	28-32	7	30-35	7-19
American kestrel	NN[2]	4/1-8/15	26-32	8-10	27-30	12
Osprey	0.5	4/1-8/31	37-38	30-35	48-59	45-50
Boreal owl	0.25	2/1-7/31	25-32	20-24	28-36	12-14
Burrowing owl	0.25	3/1-8/31	27-30	20-22	40-45	21-28
Flammulated owl	0.25	4/1-9/30	21-22	12	22-25	7-14
Great horned owl	0.25	12/1-9/31	30-35	21-28	40-50	7-14
Long-eared owl	0.25	2/1-8/15	26-28	20-26	30-40	7-14
N. saw-whet owl	0.25	3/1-8/31	26-28	20-22	27-34	7-14
Short-eared owl	0.25	3/1-8/1	24-29	12-18	24-27	7-14
Mex. Spotted owl	0.5	3/1-8/31	28-32	14-21	34-36	10-12
N. Pygmy owl	0.25	4/1-8/1	27-31	10-14	28-30	7-14
W. Screech owl	0.25	3/1-8/15	21-30	10-14	30-32	7-14
Common Barn-owl	NN[2]	2/1-9/15	30-34	20-22	56-62	7-14

[1] Length of post-fledge dependency period to parents is longer than reported in this table. Reported dependency periods reflect the amount of time the young are still dependent on the nest site; i.e. they return to the nest for feeding. [2] Due to apparent high population densities and ability to adapt to human activity, a spatial buffer is not currently considered necessary for maintenance of American kestrel or Common barn-owl populations. Actions resulting in direct mortality of individual bird or take of known nest sites is unlawful

ATTACHMENT 3.

UTAH RAPTOR MANAGEMENT EXPERTS FROM VARIOUS AGENCIES

The following list of personnel from various agencies in Utah, are recognized experts in the field of raptor ecology or have extensive field experience in managing raptor resources with competing land uses. The list is provided to inform BLM field biologists and managers of this network of specialized expertise that may be able to assist, as time permits, with specific raptor management issues. Individuals in this Utah Raptor Network, also have well established contacts with an informal extended network of highly qualified raptor ecologists outside the state (i.e. USGS, State Wildlife Agencies, and Universities etc.) which could provide an additional regional perspective.

It should be pointed out that this list is not intended to replace or interfere with established lines of communication but rather supplement these lines of communication.

Utah BLM	**David Mills**	**david_mills@blm.gov**	**435-896-1571**
Utah BLM	**Steve Madsen**	**steve_c_madsen@blm.gov**	**801-539-4058**
Utah DWR	**Dr. Jim Parrish**	**jimparrish@utah.gov**	**801-538-4788**
Utah DWR (NERO)	**Brian Maxfield**	**brianmaxfield@utah.gov**	**435-790-5355**
USFWS	**Laura Romin**	**laura_romin@usfws.gov**	**801-975-3330**
USFWS	**Diana Whittington**	**diana_whittington@usfws.gov**	**801-975-3330**
USFS	**Chris Colt**	**ccolt@fs.fed.us**	**801-896-1062**
HawkWatch Intl	**Jeff Smith**	**jsmith@hawkwatch.org**	**801-484-6808**

ATTACHMENT 4
References Cited

Code of Federal Regulations; 43 CFR 3101.1-2, Leasing Regulations.

Endangered Species Act (ESA); 16 U.S.C. 1513-1543

Migratory Bird Treaty Act (MBTA); 16 U.S.C. 703-712

Romin, Laura A. and James A. Muck, 2002, "Utah Field Office Guidelines For Raptor Protection From Human And Land Use Disturbances." U.S. Department of Interior, U.S. Fish and Wildlife Service, Utah Field Office, Salt Lake City, Utah.

Standards for Rangeland Health and Guidelines for Grazing Management; 1997. U.S. Department of Interior, Bureau of Land Management.

U.S. Department of the Interior, Bureau of Land Management; 6840 Manual.

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APPENDIX S.

DESIRED FUTURE CONDITIONS FOR VEGETATION

S.1 INTRODUCTION

The purpose of this report is to provide a description of desired vegetative conditions on the landscape over the life of the Moab RMP. This process is referred to as determining the Desired Future Condition (DFC). The determination of the DFC takes a number of factors into consideration such as:

- Current vegetation communities and conditions on the landscape;
- Landscape setting;
- Current uses of vegetative resources;
- Desired management direction for specific uses across the landscape;
- Vegetative treatment/manipulation potentials and methods;
- Current and projected climatic conditions; and
- Soil conditions and availability.

The DFC provides general landscape level guidelines, not site specific prescriptions for project or activity level work within the Moab area. When initiating "on the ground activities", either in response to management related disturbance (vegetative manipulations, damaged land restoration, fuel reductions, etc.) or natural disturbance (flooding, fire, drought, etc.), area specific guidelines would be utilized that are provided in corresponding Natural Resource Conservation Service (NRCS) Ecological Site Inventories and State and Transition model data (as these models are developed). The types of data found in these documents would allow the development of detailed prescriptions for specific vegetative type's, recommended percentages by species, distribution, etc., based on the particular elevational, climatic, soil, and landform features present at that site.

The distribution of vegetative communities across a landscape are primarily influenced by soil type, elevation, precipitation, topography, and to varying degrees by land management activities such as livestock and wildlife grazing, road and mineral development, and OHV use. These vegetative communities subsequently form a mosaic across the landscape, sometimes occurring in relatively homogenous individual species stands, more often however, occurring in various species combinations and associations dependent on the abiotic factors listed above.

Of more recent influence however, are changes in types and distribution of vegetation communities as a result of extended regional drought across southeastern Utah during the last 5-6 years. This has resulted in severe stress and in some cases loss of significant portions of vegetative communities in the region, in particular pinyon pine, sagebrush and salt desert shrub species. We have also seen an increase in the distribution of invasive species, particularly halogeton and cheatgrass. And perhaps more alarming and potentially impacting than below normal precipitation patterns over the region, is the increasing temperatures recorded over the past century. This temperature increase could have a variety of long-term effects including: plants entering spring green up earlier and going into dormancy later, altered snowmelt patterns and subsequent water availability, evapotranspiration dynamics and increased losses for soil

infiltration, in addition to affecting growth of some plants as a result of decreased nutrient uptake.

The uncertainty associated with future climatic conditions makes the identification of DFC's uncertain to some extent. The DFC's developed herein are based on some level of return to regional climatic conditions over the past 20 to 30 years. If the current ongoing regional dry trend continues, and temperatures continue to rise, these DFC's could be difficult to obtain, and any treatment efforts undertaken to help achieve these DFC's could be subject to failure.

S.2 PROCESS

The primary data source for development of the DFC for the Moab Field Office is the Southwest ReGAP (SW ReGAP) terrestrial ecological classification system. The SW ReGAP is an update of the GAP Analysis Program's mapping and assessment of regional biodiversity for a five state region (NM, AZ, CO, UT, and NV) completed in 1995. Both endeavors were multi-institutional cooperative efforts coordinated by the U.S. Geological Survey GAP Analysis Program. The classification was conducted using Landsat-7 satellite imagery, field data, digital elevation models, and other spatial data. The remote imagery utilized and the subsequent processing of this data provides a spatial resolution of 5 hectares.

Although GAP analysis was never intended to provide fine scale resolution, stand alone vegetation maps, the outcome of the terrestrial ecological system classification process provides a useful set of "proxy" vegetation association maps. The classification methodology used specifically group's terrestrial ecological systems as plant community types (associations) that co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. The systems approach complements the National Vegetation Classification system (NVCS), whose finer-scale units provide a basis for interpreting larger-scale ecological system patterns and concepts.

Three methodological improvements were utilized in the ReGAP program to increase the accuracy and utility of the vegetation map: 1) a universal standard for the identification of plant communities, the NVCS, 2) the use of a single methodology for constructing predictive models of plant community distribution, classification and regression trees (CART), and 3) the subdivision of the 5-state regions into map zones, or provinces of homogeneous geology, climate and phenology, to reduce the complexity of predictive landcover models.

Plant community types utilized in SW ReGAP are derived from a vegetation classification unit at the association or alliance level, where these are available in the NVCS (Grossman et al. 1998, Jennings et al. 2003, NatureServe 2003), or, if these are not available, other comparable vegetation units. NVCS associations are used wherever possible to describe the component biotic communities of each terrestrial system. The NVCS provides a multi-tiered, nested hierarchy for classifying vegetation types.

The SW ReGAP is intended to provide classification at a "meso-scale," both spatially and temporally, and the specific spatial and temporal scales are further refined by the biotic and ecological distinctiveness of the systems identified. A given system will typically manifest itself in a landscape at intermediate geographic scales of tens to thousands of hectares and will persist for 50 or more years. This temporal scale allows typical successional dynamics to be integrated

into the concept of each classified unit. Mapping at this scale is spatially comparable to the scale of analysis for most RMPs.

The DFC recommendations for the current revision of the Moab RMP are based on grouping the various vegetative land cover classifications identified in the SW ReGAP program for the Moab area. Analysis of the SW ReGAP data identified 43 vegetative classifications within the overall boundaries of the Moab Field office. We subsequently grouped these 43 units into 12 broader categories for the Moab RMP DFC. These groups were determined primarily by the dominant vegetation type present. These DFC groupings also correspond with vegetation groupings in the draft Utah Fire Management Plan. These groupings are shown on the Table at the end of this Appendix.

The following discussion of each vegetative group is taken primarily from information presented for each classification unit identified in SW ReGAP. The information presented includes a description of the physical environment the vegetation association occurs in, the dynamics of that system, and the vegetation types present. It should be emphasized that these descriptions describe current conditions and dynamics. At the end of each section is the DFC for that vegetation grouping. In many instances the DFC will reflect a continuation of the current systems described, with some exceptions, particularly for invasive or exotic species. The DFC will also describe what types of treatment actions would work best in that system in the event of management or natural disturbances requiring rehabilitation or restoration.

Again it will be emphasized that this DFC is a landscape level analysis, and is intended to provide general descriptions of what the desired conditions should include in any given broad vegetation community. Any details that would be required to conduct restoration or rehabilitation projects would use this only as general guidance and would refer to NRCS Ecological Site Inventories, soil surveys and other site specific data that may be available specific details for that system. The Figure illustrating the Desired Future Condition of vegetation in the Moab Field Office is shown at the end of this Appendix.

S.3 Dominant Vegetation Communities and Desired Future Conditions for the Moab Field Office RMP

S.3.1 Grasslands

Corresponding SW ReGAP Landcover Classification:

- S090 Inter-mountain Basins Semi-desert Grassland

Environment: Low-elevation grasslands in the region occur in semi-arid to arid climates at approximately 4,750-7,610 feet in elevation. Grasslands within this system are typically characterized by a sparse to moderately dense herbaceous layer dominated by medium-tall and short bunch grasses, often in a sod-forming growth. These grasslands occur in lowland and upland areas and may occupy swales, playas, mesa tops, plateau parks, alluvial flats, and plains. These grasslands typically occur on xeric sites. This system experiences cold temperate conditions. Hot summers and cold winters with freezing temperatures and snow are common. Annual precipitation is usually from 7.9-15.7 inches. A significant portion of the precipitation falls in July through October during the summer monsoon storms, with the rest falling as snow during the winter and early spring months. These grasslands occur on a variety of aspects and

slopes. Sites may range from flat to moderately steep. Soils supporting this system also vary from deep to shallow, and from sandy to finer-textured. The substrate is typically sand or shale-derived. Some sandy soil occurrences have a high cover of cryptogams on the soil. These cryptogamic species would tend to increase the stability of the highly erodible sandy soils of these grasslands during torrential summer rains and heavy wind storms (Kleiner and Harper 1977).

Vegetation: These grasslands are typically dominated or codominated by *Achnatherum hymenoides, Aristida* spp., *Bouteloua gracilis, Hesperostipa comata, Muhlenbergia pungens,* or *Pleuraphis jamesii,* and may include scattered shrubs and dwarf-shrubs of species of *Artemisia, Atriplex, Coleogyne, Ephedra, or Gutierrezia*. The dominant perennial bunch grasses and shrubs within this system are all very drought-resistant plants.

Dynamics: This system is maintained by frequent fires and sometimes associated with specific soils, often well drained clay soils. A combination of precipitation, temperature, and soils limits this system to the lower elevations within the region. The dominant perennial bunch grasses and shrubs are all very drought resistant plants. Grasses that dominate semi-arid grasslands develop a dense network of roots concentrated in the upper parts of the soil where rainfall penetrates most frequently (Blydenstein 1966, Cable 1969, Sala and Lauenroth 1985, as cited by McClaran and Van Devender 1995). *Bouteloua gracilis* is also very grazing-tolerant and generally forms a short sod. *Pleuraphis jamesii* is only moderately palatable to livestock, but decreases when heavily grazed during drought and in the more arid portions of its range where it is the dominant grass (West 1972). This grass reproduces extensively from scaly rhizomes making the plant resistant to trampling by livestock and providing good soil-binding properties (Weaver and Albertson 1956, West 1972). *Achnatherum hymenoides* is one of the most drought-tolerant grasses in the western U.S. (USDA 1937). It is also a valuable forage grass in arid and semiarid regions. Improperly managed livestock grazing could increase soil erosion, decrease cover of this palatable plant species and increase weedy species (USDA 1937). *Muhlenbergia asperifolia,* along with the flooding regime and high evaporation rate in its preferred habitat, causes accumulations of soluble salts in the soil. Total vegetation cover (density and height), species composition and soil salinity depend on the amount and timing of precipitation and flooding. Growth-inhibiting salt concentrations are diluted when the soil is saturated allowing the growth of less salt-tolerant species. As the saturated soils dry, the salt concentrates until it precipitates out on the soil surface (Dodd and Coupland 1966, Ungar 1968).

Desired Future Condition: Where native grasslands occurred historically the DFC is native grass and forb communities. In many instances native grasslands have been lost to pinyon and juniper encroachment, cheatgrass/halogeton invasion and non-native plant seedings (e.g., crested wheatgrass, perennial ryegrass, etc.). Where non-native grasslands occur the DFC may be the restoration of the native grassland or shrub community. Treatments of these native grasslands with fire, mechanical, or chemical treatments to reduce encroaching trees (mainly juniper), shrubs and invasive plants results in the potential for cheatgrass/halogeton invasion (areas below 7,000 feet that have adjacent cheatgrass/halogeton populations) (Pellant 2002). Following disturbance, these grasslands should be aggressively seeded to reduce potential for cheatgrass/halogeton and other invasive weeds.

S.3.2 SALT DESERT SHRUB

This vegetation grouping for Moab is a combination of 5 SW ReGAP vegetative cover types that occur within the boundaries of the Moab Field Office. These groupings are similar enough in characteristics to serve the purposes of broad vegetation groupings for this DFC.

Corresponding SW ReGAP Landcover Classification:

- S011 - Inter-mountain Basins Shale Badland
- S045 - Inter-mountain Basins Mat Saltbush Shrubland
- S065 - Inter-mountain Basins Mixed Salt Desert Scrub
- S079 - Inter-mountain Basins Semi-Desert Shrub Steppe
- S096 - Inter-mountain Basins Greasewood Flat

Environment: Vegetative communities within this broad area receive relatively low annual precipitation (5 to 10 inches) and infiltration rates are typically low, which translates into very little soil moisture available for plant growth. Elevation ranges from 4,000 to 5,400 feet. Regionally, thirty-three plant communities have been recognized in this zone, indicated by the dominant species: shadscale, greasewood, blackbrush, salt cedar, fourwing saltbush, nuttall saltbush, mat saltbush, buckwheat, spiny hopsage, salina wildrye, and other perennial grasses. Soils are often very saline or alkaline and vary in moisture availability from drier, well-drained sites to areas where the water table is near the surface (MacMahon 1988).

The shale-badland portions of this community are primarily composed of barren and sparsely vegetated substrates (<10% plant cover) typically derived from marine shales, but also including substrates derived from siltstones and mudstones (clay). Landforms are typically rounded hills and plains that form a rolling topography. The harsh soil properties and high rate of erosion and deposition are driving environmental variables supporting sparse dwarf-shrubs and herbaceous vegetation.

The mat saltbush shrubland areas occur on gentle slopes and rolling plains primarily associated with the Mancos Shale badlands in the Moab area. Substrates are shallow, typically saline, alkaline, fine-textured soils developed from shale or alluvium. Infiltration rate is typically low. These landscapes that typically support dwarf shrublands composed of relatively pure stands of *Atriplex* spp. The herbaceous layer is typically sparse. Scattered perennial forbs occur and the perennial grasses may dominate the herbaceous layer. In less saline areas, there may be inclusion grasslands. Annuals are seasonally present in some areas.

The mixed salt desert scrub communities consist of open-canopied shrublands of typically saline basins, alluvial slopes and plains. Substrates are often saline and calcareous, medium- to fine-textured alkaline soils, but include some coarser-textured soils. The vegetation is characterized by a typically open to moderately dense shrubland composed of one or more *Atriplex* species. Other shrubs present may also codominate. The herbaceous layer varies from sparse to moderately dense and is dominated by perennial graminoids. Various forbs are also present.

The semi-desert shrub steppe component typically occurs at lower elevations on alluvial fans and flats with moderate to deep soils. This semi-arid shrub-steppe is typically dominated by graminoids (>25% cover) with an open shrub layer, but includes sparse mixed shrublands without a strong graminoid layer. The woody layer is often a mixture of shrubs and dwarf-

shrubs. Scattered *Artemisia tridentata* may be present but does not dominate. The general aspect of occurrences may be either open shrubland with patchy grasses or patchy open herbaceous layer. Disturbance may be important in maintaining the woody component. Microphytic crust is very important in some occurrences.

The greasewood flat component of this group typically occurs near drainages on stream terraces and flats or may form rings around playas. Sites typically have saline soils, a shallow water table and flood intermittently, but remain dry for most growing seasons. This system usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominant or codominant. Occurrences are often surrounded by mixed salt desert scrub. The herbaceous layer, if present, is usually dominated by graminoids. There may be inclusions of herbaceous types.

Vegetation: Occurrences of these grouped ecological systems varies from almost pure occurrences of single species to fairly complex mixtures. The characteristic mix of low shrubs and grasses is sparse, with large open spaces between the plants (Blaisdell and Holmgren 1984). Occurrences have a sparse to moderately dense cover of woody species that is dominated by *Atriplex canescens* (may codominate with *Artemisia tridentata*), *Atriplex confertifolia* (may codominate with *Lycium andersonii*), *Atriplex obovata*, *Picrothamnus desertorum*, or *Krascheninnikovia lanata*. Other shrubs that may occur within these occurrences include *Purshia stansburiana, Psorothamnus polydenius, Ephedra* spp., *Acacia greggii, Encelia frutescens, Tiquilia latior, Atriplex polycarpa, Atriplex lentiformis, Picrothamnus desertorum* (= *Artemisia spinescens*), *Artemisia frigida, Chrysothamnus* spp., *Lycium* ssp., *Suaeda* spp., *Yucca glauca,* and *Tetradymia spinosa*.

Dwarf-shrubs include *Gutierrezia sarothrae* and *Eriogonum* spp. Warm-season medium-tall and short perennial grasses dominate in the sparse to moderately dense graminoid layer. The species present depend on the geographic range of the grasses, alkalinity/salinity and past land use. Species may include *Pleuraphis jamesii, Bouteloua gracilis, Sporobolus airoides, Sporobolus cryptandrus, Achnatherum hymenoides, Elymus elymoides, Distichlis spicata, Leymus salinus, Pascopyrum smithii, Hesperostipa comata, Pseudoroegneria spicata, Poa secunda, Leymus ambiguus,* and *Muhlenbergia torreyi*. A number of annual species may also grow in association with the shrubs and grasses of this system, although they are usually rare and confined to areas of recent disturbance (Blaisdell and Holmgren 1984). Forb cover is generally sparse. Perennial forbs that might occur include *Sphaeralcea coccinea, Chaetopappa ericoides, Xylorhiza venusta, Descurainia sophia,* and *Mentzelia* species. Annual natives include *Plantago* spp., *Vulpia octoflora,* or *Monolepis nuttalliana*. Associated halophytic annuals include *Salicornia rubra, Salicornia bigelovii*, and *Suaeda* species. Exotic annuals that may occur include *Salsola kali* and *Bromus tectorum*. Cacti like *Opuntia* spp. and *Echinocereus* spp. may be present in some occurrences. Trees are not usually present but some scattered *Juniperus* spp. may be found.

Dynamics: West (1982) stated that "salt desert shrub vegetation occurs mostly in two kinds of situations that promote soil salinity, alkalinity, or both. These are either at the bottom of drainages in enclosed basins or where marine shales outcrop." However, salt-desert shrub vegetation may be an indication of climatically dry as well as physiologically dry soils (Blaisdell and Holmgren 1984). Not all salt-desert shrub soils are salty, and their hydrologic characteristics may often be responsible for the associated vegetation (Naphan 1966). Species of the salt-desert shrub complex have different degrees of tolerance to salinity and aridity, and they tend to sort themselves out along a moisture/salinity gradient (West 1982). Species and communities are

apparently sorted out along physical, chemical, moisture, and topographic gradients through complex relations that are not understood and are in need of further study (Blaisdell and Holmgren 1984). The winter months within this system are a good time for soil moisture accumulation and storage. There is generally at least one good snow storm per season that will provide sufficient moisture to the vegetation. The winter moisture accumulation amounts will affect spring plant growth. Plants may grow as little as a few inches to 1 m. Unless more rains come in the spring, the soil moisture will be depleted in a few weeks, growth will slow and ultimately cease, and the perennial plants will assume their various forms of dormancy (Blaisdell and Holmgren 1984). If effective rain comes later in the warm season, some of the species will renew their growth from the stage at which it had stopped. Others, having died back, will start over as if emerging from winter dormancy (Blaisdell and Holmgren 1984). *Atriplex confertifolia* shrubs often develop large leaves in the spring, which increase the rate of photosynthesis. As soil moisture decreases, the leaves are lost, and the plant takes on a dead appearance. During late fall, very small overwintering leaves appear which provide some photosynthetic capability through the remainder of the year (IVC 1999). Other communities are maintained by intra- or inter-annual cycles of flooding followed by extended drought, which favor accumulation of transported salts. The moisture supporting these intermittently flooded wetlands is usually derived off-site, and they are dependent upon natural watershed function for persistence (Reid et al. 1999).

In summary, desert communities of perennial plants are dynamic and changing. The composition within this system may change dramatically and may be both cyclic and unidirectional. Superimposed on the compositional change is great variation from year to year in growth of all the vegetation – the sum of varying growth responses of individual species to specific conditions of different years (Blaisdell and Holmgren 1984). Desert plants grow when temperature is satisfactory, but only if soil moisture is available at the same time. Because amount of moisture is variable from year to year and because different species flourish under different seasons of soil moisture, seldom do all components of the vegetation thrive in the same year (Blaisdell and Holmgren 1984).

Desired Future Condition: The DFC for this vegetation community consists of native, open salt desert scrub vegetation with little to no cheatgrass or halogeton cover, and scattered pockets and patches of herbaceous material and forbs, primarily in the lower areas of the terrain. These communities should exhibit the types of dynamic interactions identified above.

Soils that these communities often occur on are generally highly sensitive to erosion under most types of disturbance, and are usually the first soils to show evidence of stress and/or failure during long sustained periods of drought. As indicted, most of the plant species present have developed a natural level of drought resistance based on the minimal amounts of precipitation they receive even during good climatic cycles; however extended periods of low precipitation can cross critical precipitation required thresholds for the plants. Salt desert shrub communities are often susceptible to severe drought and may require partial or total removal of livestock during prolonged drought (USDA, SCS, Grand County Soil Survey, Central Part, 1989). The best management practices in trying to achieve the DFC during extended drought conditions are to avoid unnecessary disturbance.

Treatments on salt desert scrub types can consist of a combination of mechanical, chemical, seeding and biological treatments to reduce cheatgrass and halogeton cover and restore native

communities. However, restoration potentials for salt desert shrub communities are often limited due to high salt contents within the soil and degree of aridity which limit vegetative response (USDA, SCS, Grand County Soil Survey, Central Part, 1989). Surface disturbing treatments should not be attempted during drought conditions however. Prescribed fire may be used in conjunction with seeding when part of a cheatgrass/halogeton control objective (Pellant 2002). However, fire within these communities often results in high densities of exotic annual grasses (*Eremopyrum triticeum*, MFO). Due to the high incidence of cheatgrass and halogeton in this vegetation type, consider seeding following any surface disturbing activity.

S.3.3 BLACKBRUSH

Corresponding SW ReGAP Landcover Classification:

- 059 Colorado Plateau Blackbrush-Mormon Tea Shrubland

Environment: This ecological system typically occurs on gentle benchlands, colluvial slopes, pediments or bajadas, and steep or rocky slopes of mountains, canyons, and mesas with varying aspects. This system is an evergreen, microphyllous desert scrub with succulents, half-shrubs, and scattered deciduous shrubs typically found at elevations ranging from 1,900-5,250 feet. This shrubland system occurs in an arid to semi-arid climate with annual precipitation in the form of summer monsoons and winter storms averaging approximately 8 in. Soils are highly variable and parent materials may include shale, sandstone, limestone, quartzites, and igneous rocks. Soils are generally coarse-textured, calcareous, non-saline and gravelly, often rocky, shallow and well-drained. Substrates are shallow, typically sandy soils over sandstone alluvium or caliche. It also occurs in deeper soils on sandy plains where it may have invaded desert grasslands. Effective soil moisture appears to be primarily controlled by regolith depth and position in relation to the water table. This brushland system occupies most sites where regolith is uniformly shallow. In association with blackbrush (*Coleogyne ramosissima*) sites, the soil moisture is concentrated on top of impermeable bedrock at a shallow depth. This perching effect allows for gradual uptake of moisture by the plants roots (Loope and West 1979). This permits growth of plants with more mesic habitat requirements (Warren et al. 1982). On sites with deep soil, blackbrush may occur in almost pure occurrences with only a few associated species (Warren et al. 1982). Dark-colored cryptogamic soil crusts composed of lichens, mosses, fungi, and algae, are often present in this system in fairly undisturbed areas. Sandy soils may have more cryptogamic crusts than clayish or silty soil surfaces.

Vegetation: The vegetation within this ecological system is characterized by extensive open shrublands dominated by *Coleogyne ramosissima* often with *Ephedra viridis, Ephedra torreyana*, or *Grayia spinosa*. Sandy portions may include *Artemisia filifolia* as codominant. Within a blackbrush shrubland disturbed patches are dominated by shrubs such as *Chrysothamnus viscidiflorus, Ericameria* spp., *Ephedra* spp., *Grayia spinosa, Poliomintha incana* or exotic annual grasses. There is usually a sparse herbaceous layer with some perennial grasses and forbs such as *Achnatherum hymenoides, Pleuraphis jamesii*, or *Sporobolus cryptandrus*. Annual grasses and forbs are present seasonally. Some characteristic species associated with this system include the shrubs *Gutierrezia sarothrae, Chrysothamnus viscidiflorus, Yucca baccata*, and succulents such as *Opuntia* spp., *Echinocereus* spp., *and Echinocactus* spp., the graminoid *Pleuraphis rigida*, and perennial forbs such as *Machaeranthera pinnatifida* and *Sphaeralcea ambigua*. Adjacent vegetation often includes

Atriplex dominated shrubland communities and upland areas of pinyon-juniper woodlands. Grasslands dominated by *Pleuraphis jamesii*, *Hesperostipa comata*, and *Achnatherum hymenoides* also occur.

Dynamics: Fire does not appear to play a role in maintenance of shrublands within this system. Topographic breaks dissect the landscape, and isolated pockets of vegetation are separated by rock walls or steep canyons. Blackbrush is fire-intolerant (Loope and West 1979). Following fires, these communities are often colonized by non-native grasses, which serve to encourage recurrent fires and delay shrub regeneration (IVC 1999). In shallow regolith situations, secondary succession, in the sense of site preparation by seral plants, may not occur at all (Loope and West 1979).

Desired Future Condition: The DFC recommends a vegetative composition of dense-to-scattered shrubs and dense-to-open native grasses. Disturbances should be avoided whenever possible in blackbrush communities due to invasive species concerns and extremely poor regeneration of blackbrush following disturbance.

Following surface disturbing activities, aggressively seed to reduce potential for invasion of cheatgrass/halogeton and noxious weeds.

S.3.4 SAGEBRUSH

This vegetation grouping for Moab is a combination of 3 SW ReGAP vegetative cover types that occur within the boundaries of the Moab Field Office. These groupings are similar enough in characteristics to serve the purposes of broad vegetation groupings for this DFC. The groupings range from relatively pure stands of big sage to mixed stands to montane steppe environments.

Corresponding SW ReGAP Landcover Classification:

- 054 - Inter-Mountain Basins Big Sagebrush Shrubland
- 056 - Colorado Plateau Mixed Low Sagebrush Shrubland
- 071 - Inter-Mountain Basins Montane Sagebrush Steppe

Environment: The predominant community in the Moab Field Office area is the Colorado Plateau mixed low sagebrush shrubland. This ecological system occurs in canyons, gravelly draws, hilltops, and dry flats at elevations generally below 5,900 feet. Soils are often rocky, shallow, and alkaline. It includes open shrublands and steppe. Semi-arid grasses are often present and may form a graminoid layer with over 25% cover.

The climate regime is cool, semi-arid to subhumid, with yearly precipitation ranging from 10 to 35 in/year. Much of this precipitation falls as snow. Temperatures are continental with large annual and diurnal variation. In general this system shows an affinity for mild topography, fine soils, and some source of subsurface moisture. Soils generally are moderately deep to deep, well-drained, and of loam, sandy loam, clay loam, or gravelly loam textural classes; soils often have a substantial volume of coarse fragments, and are derived from a variety of parent materials. This system primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. All aspects are represented, but the higher elevation occurrences may be restricted to south- or west-facing slopes.

The environment for the big sagebrush shrubland system is typically broad basins between mountain ranges, plains and foothills between 4,900-7,500 feet elevation. Soils are typically deep, well drained and non-saline. These shrublands are dominated by *Artemisia tridentata ssp. tridentata* and/or *Artemisia tridentata ssp. wyomingensis*. Scattered Juniper may be present in some stands. *Ericameria nauseosa, Chrysothamnus viscidiflorus, Purshia tridentata,* or *Symphoricarpos oreophilus* may codominate disturbed stands. Perennial herbaceous components typically contribute less than 25% vegetative cover. Common graminoid species include *Achnatherum hymenoides, Bouteloua gracilis, Elymus lanceolatus, Hesperostipa comata, Leymus cinereus, Pleuraphis jamesii, Pascopyrum smithii, Poa secunda*, or *Pseudoroegneria spicata*.

The environment of the montane sagebrush steppe includes sagebrush communities occurring at montane and subalpine elevations from 3,200 feet to over 9,800 feet. Climate is cool, semi-arid to subhumid. This system primarily occurs on deep-soiled to stony flats, ridges, nearly flat ridgetops, and mountain slopes. It is composed primarily of mountain sagebrush and related taxa such as *Artemisia tridentata ssp*, non-riparian *Artemisia cana ssp. viscidula*, and *Artemisia arbuscula ssp. arbuscula*. *Purshia tridentata* may codominate or even dominate some stands. Other common shrubs include *Symphoricarpos* spp., *Amelanchier* spp., *Ericameria nauseosa, Peraphyllum ramosissimum, Ribes cereum,* and *Chrysothamnus viscidiflorus*. Most stands have an abundant perennial herbaceous layer (over 25% cover), but this system also includes *Artemisia tridentata ssp. vaseyana* shrublands. Common graminoids include *Hesperostipa comata, Poa fendleriana, Elymus trachycaulus, Bromus carinatus, Poa secunda, Leucopoa kingii, Deschampsia caespitosa,* and *Pseudoroegneria spicata*. Frequent wildfire maintains an open herbaceous-rich steppe condition.

Vegetation: Vegetation types within these ecological systems are dominated by *Artemisia tridentata ssp. vaseyana, Artemisia cana ssp. viscidula*, or *Artemisia tridentata ssp. spiciformis*. A variety of other shrubs can be found in some occurrences, but these are seldom dominant. They include *Artemisia frigida, Artemisia arbuscula, Ericameria nauseosa, Chrysothamnus viscidiflorus, Symphoricarpos oreophilus, Purshia tridentata, Peraphyllum ramosissimum, Ribes cereum, Rosa woodsii, Ceanothus velutinus,* and *Amelanchier alnifolia*. The canopy cover is usually between 20-80%. The herbaceous layer is usually well represented, but bare ground may be common in particularly arid or disturbed occurrences. Graminoids that can be abundant include *Festuca idahoensis, Festuca thurberi, Festuca ovina, Elymus elymoides, Stipa* spp., *Pascopyrum smithii, Bromus carinatus, Elymus trachycaulus, Pseudoroegneria spicata, Poa fendleriana,* or *Poa secunda,* and *Carex* spp. Forbs are often numerous and an important indicator of health. Forb species may include *Castilleja, Potentilla, Erigeron, Phlox, Astragalus, Geum, Lupinus,* and *Eriogonum, Balsamorhiza sagittata, Achillea millefolium, Antennaria rosea*, and *Eriogonum umbellatum, Fragaria virginiana, Artemisia ludoviciana, Hymenoxys hoopesii (= Helenium hoopesii),* etc.

Dynamics: Healthy sagebrush shrublands are very productive, are often grazed by domestic livestock, and are strongly preferred during the growing season (Padgett et al. 1989). Prolonged livestock use can cause a decrease in the abundance of native bunch grasses and increase in the cover of shrubs and non-native grass species, such as *Poa pratensis*. Research suggests that stand-replacement fires burned every 10–100 years depending on the particular sagebrush species and its associated habitat (Miller 2002, Brown 2000). *Artemisia cana* resprouts vigorously following spring fire, and prescribed burning may increase shrub cover. Conversely,

fire in the fall may decrease shrub abundance (Hansen et al. 1995). *Artemisia tridentata* is generally killed by fires and may take over ten years to form occurrences of some 20% cover or more. The condition of most sagebrush steppe has been degraded due to fire suppression and heavy livestock grazing. It is unclear how long restoration will take to restore degraded occurrences.

Desired Future Condition: The DFC for this vegetative community is healthy sagebrush defined as diverse age classes with an understory of native grasses and forbs (Paige and Ritter 1999).

Treatments for dense sagebrush (>30%) (Winward 1991) with fire, mechanical or chemical treatments would be to reduce sagebrush canopy cover and improve native grass and forb density and cover; an additional objective in treating sagebrush is to remove encroaching pinyon and juniper trees (Miller and Tausch 2001).

Following wildfire, areas should be aggressively re-seeded to promote native understory grasses and forbs and reduce invasion of cheatgrass/halogeton and noxious weeds. Consider including sagebrush in seeding mixes or planting sagebrush seedlings in high-value wildlife areas following large, high-severity wildfires when natural seed sources would be lacking.

S.3.5 PINYON-JUNIPER

This vegetation grouping for Moab is a combination of 3 SW ReGAP vegetative cover types that occur within the boundaries of the Moab Field Office. These groupings are similar enough in characteristics to serve the purposes of broad vegetation groupings for this DFC.

Corresponding SW ReGAP Landcover Classification:

- S039 - Colorado Plateau Pinyon-Juniper Woodland
- S052 - Colorado Plateau Pinyon-Juniper Shrubland
- S010 - Colorado Plateau Mixed Bedrock Canyon and Tableland

Environment: The woodlands portion of this ecological system occurs on dry mountains and foothills in the Moab region. It is typically found at lower elevations ranging from 4,900-8,000 feet. These woodlands occur on warm, dry sites on mountain slopes, mesas, plateaus, and ridges. Severe climatic events occurring during the growing season, such as frosts and drought, are thought to limit the distribution of pinyon-juniper woodlands to relatively narrow altitudinal belts on mountainsides. Soils supporting this system vary in texture ranging from stony, cobbly, gravelly sandy loams to clay loam or clay.

The shrubland component of this system is typically found on rocky mesa tops and slopes, but these stunted tree shrublands may extend further upslope along the low elevation margins of taller pinyon-juniper woodlands. Sites are drier than Colorado Plateau Pinyon-Juniper Woodland. Substrates are shallow/rocky and shaley soils at lower elevations (3,900-6,500 feet). Sparse examples of the system grade into Colorado Plateau Mixed Bedrock Canyon and Tableland. The vegetation is dominated by dwarfed (usually <3 m tall) *Pinus edulis* and/or *Juniperus osteosperma* trees forming extensive tall shrublands in the region along low-elevation margins of pinyon-juniper woodlands. Other shrubs, if present, may include *Artemisia nova, Artemisia tridentata ssp. wyomingensis*, *Chrysothamnus viscidiflorus*, or *Coleogyne*

ramosissima. Herbaceous layers are sparse to moderately dense and typically composed of xeric graminoids

The mixed bedrock canyon and tableland component of this larger ecological system is found from foothill to subalpine elevations and includes barren and sparsely vegetated landscapes (generally <10% plant cover) of steep cliff faces, narrow canyons, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Also included are unstable scree and talus slopes that typically occur below cliff faces. Widely scattered trees and shrubs may include *Abies concolor, Pinus edulis, Pinus flexilis, Juniperus* spp., *Artemisia tridentata, Purshia tridentata, Cercocarpus ledifolius, Ephedra* spp., *Holodiscus discolor*, and other species often common in adjacent plant communities.

Vegetation: *Pinus edulis* and/or *Juniperus osteosperma* dominate the tree canopy. *Juniperus scopulorum* may codominate or replace *Juniperus osteosperma* at higher elevations. Understory layers are variable and may be dominated by shrubs, graminoids, or be absent. Associated species include *Arctostaphylos patula, Artemisia tridentata, Cercocarpus intricatus, Cercocarpus montanus, Coleogyne ramosissima, Purshia stansburiana, Purshia tridentata, Quercus gambelii, Bouteloua gracilis, Pleuraphis jamesii*, or *Poa fendleriana*.

Dynamics: Evidence indicates many pinyon-juniper stands have encroached on native grasslands and shrubland over the past 100 years (Miller and Wigand 1994). The exact mechanics of this encroachment are not fully understood, but is likely driven by a combination of fire exclusion, grazing and the relatively wet climate of the 20th century. The historical role of fire (estimated 15–50 years) prevented encroachment of pinyon and juniper into other vegetation communities (Heyerdahl et al. 2004, Miller and Tausch 2001, Bradley et al. 1992, Romme et al. 2002).

Pinyon dominate at higher elevations, and tend to form more closed-canopied stands that exhibit forest like dynamics and species composition, commonly including a significant shrub component of oaks and alder leaf, mountain mahogany and limited grasses. Juniper tends to grow at lower elevations and in more arid areas as its scaled foliage allows it to conserve water more effectively than pinyon pine. Juniper dominated woodlands tend to include open savannas of scattered trees without a significant shrub component, except in areas where big sagebrush has become dominant as a consequence of overgrazing.

Over the past 50 years, anecdotal evidence suggests tree densities and canopy cover have increased, and junipers and pinyon pines have expanded upslope into ponderosa pine forests and downslope into grass and shrub communities. Densities have increased in some areas to the point that larger proportions of pinyon-juniper woodland can now support crown fires. Additionally, pinyon is very susceptible to large scale die-offs from engraver beetles during drought induced stress. Over the past 5 to 6 years millions of acres of pinyon have been lost to this insect across the entire southwest US, including some pinyon stands in the Moab area.

Historical occurrence of pinyon and juniper is difficult to map, but pre-settlement trees are generally located in shallow, rocky soils and tend to have a unique growth form characterized by rounded, spreading canopies; large basal branches; large irregular trunks; and furrowed fibrous bark (Miller and Rose 1999). Historic fire return intervals in these protected sites are greater than 100 years (Romme et al. 2002).

Desired Future Condition: Where pinyon and juniper occur historically the DFC are open stands of pinyon and juniper with native grass and shrub understory (Miller and Wigand 1994,

FEIS 2004). Where pinyon and juniper did not occur historically, the DFC is the native shrub, grass and forest communities that the pinyon and juniper have invaded.

Follow disturbance or treatments in these communities with seeding in stands which lack native understory vegetation. Seeding will help discourage the establishment of invasive annual grasses.

S.3.6 PONDEROSA PINE

Corresponding SW ReGAP Landcover Classification:

- S036 - Rocky Mountain Ponderosa Pine Woodland

Environment: This ecological system within the region occurs at the lower treeline/ecotone between grassland or shrubland and more mesic coniferous forests typically in warm, dry, exposed sites at elevations ranging from 6,500-8,500 feet. It can occur on all slopes and aspects; however, it commonly occurs on moderately steep to very steep slopes or ridgetops. This ecological system generally occurs on igneous, metamorphic, and sedimentary material derived soils (Youngblood and Mauk 1985). Characteristic soil features include good aeration and drainage, coarse textures, circumneutral to slightly acid pH, an abundance of mineral material, and periods of drought during the growing season. Some occurrences may occur as edaphic climax communities on very skeletal, infertile, and/or excessively drained soils, such as pumice, cinder or lava fields, and scree slopes. Surface textures are highly variable in this ecological system ranging from sand to loam and silt loam. Exposed rock and bare soil consistently occur to some degree in all the associations. Precipitation generally contributes 10-23 in annually to this system, mostly through winter storms and some monsoonal summer rains. Typically a seasonal drought period occurs throughout this system as well. Fire plays an important role in maintaining the characteristics of these open canopy woodlands. However, soil infertility and drought may contribute significantly in some areas as well.

Vegetation: *Pinus ponderosa* is the predominant conifer; *Pseudotsuga menziesii*, *Pinus edulis*, and *Juniperus* spp. may be present in the tree canopy. The understory is usually shrubby; with *Artemisia nova*, *Artemisia tridentata*, *Arctostaphylos patula*, *Arctostaphylos uva-ursi*, *Cercocarpus montanus*, *Cercocarpus ledifolius*, *Purshia stansburiana*, *Purshia tridentata*, *Quercus gambelii*, *Symphoricarpos oreophilus*, *Prunus virginiana*, *Amelanchier alnifolia*, and *Rosa* spp. are common species. *Pseudoroegneria* spicata and species of *Hesperostipa*, *Achnatherum*, *Festuca*, *Muhlenbergia*, and *Bouteloua* are some of the common grasses.

Dynamics: *Pinus ponderosa* is a drought-resistant, shade-intolerant conifer which usually occurs at lower treeline in the major ranges of the western United States. Historically, ground fires and drought were influential in maintaining open-canopy conditions in these woodlands. With settlement and subsequent fire suppression, occurrences have become denser. Presently, many occurrences contain understories of more shade-tolerant species, such as *Pseudotsuga menziesii* and/or *Abies* spp., as well as younger cohorts of Pinus ponderosa. These altered occurrence structures have affected fuel loads and alter fire regimes. Presettlement fire regimes were primarily frequent (5-15 year return intervals), low-intensity ground fires triggered by lightning strikes or deliberately set fires by Native Americans. With fire suppression and increased fuel loads, fire regimes are now less frequent and often become intense crown fires, which can kill mature *Pinus ponderosa* (Reid et al. 1999). Establishment is erratic and believed to be linked to periods of adequate soil moisture and good seed crops as well as fire frequencies, which allow

seedlings to reach sapling size. Longer fire-return intervals have resulted in many occurrences having dense subcanopies of overstocked and unhealthy young *Pinus ponderosa* (Reid et al. 1999). Mehl (1992) states the following: "Where fire has been present, occurrences will be climax and contain groups of large, old trees with little understory vegetation or down woody material and few occurring dead trees. The age difference of the groups of trees would be large. Where fire is less frequent there will also be smaller size trees in the understory giving the occurrence some structure with various canopy layers. Dead, down material will be present in varying amounts along with some occurring dead trees. In both cases the large old trees will have irregular open, large branched crowns. The bark will be lighter in color, almost yellow, thick and some will like have basal fire scars." Grace's warbler, Pygmy nuthatch, and flammulated owl are indicators of healthy ponderosa pine woodlands. All of these birds prefer mature trees in an open woodland setting (Winn 1998, Jones 1998, Levad 1998 as cited in Rondeau 2001).

Desired Future Condition: The DFC for Ponderosa pine communities consists of open stands with a native grass and forb understory. Consider mechanical treatments in dense stands. Reduce juniper encroachment through fire (preferred when fuels conditions allow) or mechanical treatments. Following wildfires or other disturbance, consider seeding to reduce invasive weeds and planting ponderosa pine seedlings for forest restoration and rehabilitation.

S.3.7 MOUNTAIN SHRUB

Corresponding SW ReGAP Landcover Classification:

- S046 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland
- S047 - Rocky Mountain Lower Montane-Foothill Shrubland

Environment: The gambel oak-mixed montane shrubland ecological system occurs in the mountains, plateaus and foothills. These shrublands are most commonly found along dry foothills, lower mountain slopes, from approximately 6,500 to 9,500 feet elevation, and are often situated above pinyon-juniper woodlands. Substrates are variable typically poorly developed and include soil types ranging from calcareous, heavy, fine-grained loams to sandy loams, gravelly loams, clay loams, deep alluvial sand, or coarse gravel. Climate is semi-arid and characterized by mostly hot-dry summers with mild to cold winters and annual precipitation of 10 to 27 inches. Precipitation mostly occurs as winter snows but may also consist of some late summer rains. Although this is a shrub-dominated system, some trees may be present. In older occurrences, or occurrences on mesic sites, some of the shrubs may acquire tree-like sizes. Adjacent communities often include woodlands or forests at higher elevations, and *Pinus edulis* and *Juniperus osteosperma* on the lower and adjacent elevations. Shrublands of *Artemisia tridentata* or grasslands of *Festuca* sp., *Stipa* sp., or *Pseudoroegneria* sp. may also be present at the lower elevations.

The lower montane-foothill scrubland ecological system is found in the foothills, canyon slopes and lower mountain slopes on outcrops and canyon slopes. These shrublands occur between 4,900-9,500 feet elevations and are usually associated with exposed sites, rocky substrates, and dry conditions, which limit tree growth. It is common where *Quercus gambelii* is absent and in drier foothills and prairie hills. Scattered trees or inclusions of grassland patches or steppe may be present, but the vegetation is typically dominated by a variety of shrubs. Grasses are represented as species of *Muhlenbergia*, *Bouteloua*, *Hesperostipa*, and *Pseudoroegneria spicata*. Fires play an important role in this system as the dominant shrubs usually have a severe die-

back, although some plants will stump sprout. *Cercocarpus montanus* requires a disturbance such as fire to reproduce, either by seed sprout or root crown sprouting. Fire suppression may have allowed an invasion of trees into some of these shrublands, but in many cases sites are too xeric for tree growth.

Vegetation: Vegetation types in this system may occur as sparse to dense shrublands composed of moderate to tall shrubs. Occurrences may be multi-layered, with some short shrubby species occurring in the understory of the dominant overstory species. In many occurrences of this system, the canopy is dominated by the broad-leaved deciduous shrub *Quercus gambelii*, which occasionally reaches small tree size. Occurrences can range from dense thickets with little understory to relatively mesic mixed-shrublands with a rich understory of shrubs, grasses and forbs. These shrubs often have a patchy distribution with grass growing in between. Scattered trees are occasionally present in stands and typically include species of *Pinus* or *Juniperus*. Characteristic shrubs that may co-occur, or be singularly dominant, include *Amelanchier alnifolia*, *Amelanchier utahensis*, *Arctostaphylos patula*, *Artemisia tridentata*, *Cercocarpus montanus*, *Prunus virginiana*, *Purshia stansburiana*, *Rosa* spp., *Symphoricarpos oreophilus*, and *Symphoricarpos rotundifolius*. The herbaceous layer is sparse to moderately dense, ranging from 1-40% cover. Perennial graminoids are the most abundant species, particularly *Bouteloua curtipendula*, *Bouteloua gracilis*, *Aristida* spp., *Carex geyeri*, *Festuca* spp., *Muhlenbergia* spp., and *Stipa* spp. Many forbs and fern species can occur, but none have much cover. Commonly present forbs include *Achillea millefolium*, *Artemisia* spp., *Geranium* spp., *Thalictrum fendleri*, and *Vicia americana*. Ferns include species of *Cheilanthes* and *Woodsia*. Annual grasses and forbs are seasonally present, and weedy annuals are often present, at least seasonally.

Dynamics: Fire typically plays an important role in this system, causing die-back of the dominant shrub species in some areas, promoting stump sprouting of the dominant shrubs in other areas, and controlling the invasion of trees into the shrubland system. Natural fires typically result in a system with a mosaic of dense shrub clusters and openings dominated by herbaceous species. In some instances these associations may be seral to the adjacent *Pinus ponderosa*, *Abies concolor*, and *Pseudotsuga menziesii* woodlands and forests. Ream (1964) noted that on many sites in Utah, Gambel oak may be successional and replaced by bigtooth maple (*Acer grandidentatum*).

Desired Future Condition: The DFC for these vegetation communities consists of stands with patches of differing age classes and densities. In fuel hazard situations the DFC is greatly reduced vegetation density or a conversion to less-flammable vegetation. When possible, allow fire to play its natural role in a historical fire-return.

Treat large expanses of even-aged, dense, homogenous stands to result in patches of diverse age classes [see Rondeau (2001) for patch size guidance]. To achieve greater habitat diversity and decreased potential for large-scale high-severity fire, reduce invasion of pinyon and juniper and reduce the average age of stands through fire, mechanical or biological (i.e., grazing goats) treatments. Since most of these species sprout following wildfire, consider seeding only to reduce potential for invasive weeds.

S.3.8 DOUGLAS FIR - MIXED CONIFER

This vegetation grouping for Moab is a combination of 6 SW ReGAP vegetative cover types that occur within the boundaries of the Moab Field Office. These groupings are similar enough in

characteristics to serve the purposes of broad vegetation groupings for this DFC. In addition, most of the spruce, fir and aspen woodlands on BLM lands within the Moab Field Office boundary occur in the rugged and remote terrain of the Book Cliffs, where these vegetation types occur in a mixed mosaic across a significant elevational gradient. Vegetation and dynamics of these systems are not all described in detail, with some of this information presented under the environment heading.

Corresponding SW ReGAP Landcover Classification:

- S023 - Rocky Mountain Aspen Forest and Woodland
- S028 - Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland
- S030 - Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland
- S032 - Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland
- S034 - Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland
- S042 - Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland

Environment: Climate within these systems is temperate with a relatively long growing season, typically cold winters and deep snow. Mean annual precipitation is greater than 15 inches and typically greater than 20 inches, except in semi-arid environments where occurrences are restricted to mesic microsites such as seeps or large snow drifts. Occurrences at high elevations are restricted by cold temperatures and are found on warmer southern aspects. At lower elevations occurrences are restricted by lack of moisture and are found on cooler north aspects and mesic microsites. The soils are typically deep and well developed with rock often absent from the soil. Soil texture ranges from sandy loam to clay loams.

The aspen forest and woodland ecological system occurs primarily in the montane and subalpine zones. Elevations generally range from 5,000-10,000 feet, but occurrences can be found at lower elevations in some regions. Topography is variable, sites range from level to steep slopes. Distribution of this ecological system is primarily limited by adequate soil moisture required to meet its high evapotranspiration demand, and secondarily is limited by the length of the growing season or low temperatures. Occurrences of this system originate and are maintained by stand-replacing disturbances such as avalanches, crown fire, insect outbreak, disease and windthrow, or clearcutting by man or beaver, within the matrix of conifer forests.

The subalpine dry-mesic spruce-fir forest and woodland consists primarily of Engelmann spruce and subalpine fir forests. Elevations range from 5,000-11,000 feet. Sites within this system are cold year-round, and precipitation is predominantly in the form of snow, which may persist until late summer. Snowpacks are deep and late-lying, and summers are cool. Frost is possible almost all summer and may be common in restricted topographic basins and benches. Despite their wide distribution, the tree canopy characteristics are remarkably similar, with *Picea engelmannii* and *Abies lasiocarpa* dominating either mixed or alone. *Pinus contorta* is common in many occurrences and patches of pure *Pinus contorta* are not uncommon, as well as mixed conifer/*Populus tremuloides* stands. Disturbance includes occasional blow-down, insect outbreaks and stand-replacing fire.

The subalpine mesic spruce-fir forest and woodland is a high-elevation system of the Rocky Mountains, dominated by *Picea engelmannii* and *Abies lasiocarpa*. Occurrences are typically found in locations with cold-air drainage or ponding, or where snowpacks linger late into the

summer, such as north-facing slopes and high-elevation ravines. They can extend down in elevation below the subalpine zone in places where cold-air ponding occurs; northerly and easterly aspects predominate. These forests are found on gentle to very steep mountain slopes, high-elevation ridgetops and upper slopes, plateaulike surfaces, basins, alluvial terraces, well-drained benches, and inactive stream terraces. Disturbances include occasional blow-down, insect outbreaks and stand-replacing fire.

The montane dry-mesic mixed conifer forest and woodland is a highly variable ecological system of the montane zone of the Rocky Mountains. These are mixed-conifer forests occurring on all aspects at elevations ranging from 4,000 to 10,500 feet. Rainfall averages less than 30 in per year with summer "monsoons" during the growing season contributing substantial moisture. The composition and structure of overstory is dependent upon the temperature and moisture relationships of the site, and the successional status of the occurrence. This system was undoubtedly characterized by a mixed severity fire regime in its "natural condition", characterized by a high degree of variability in lethality and return interval.

The rocky mountain montane mesic mixed conifer forest and woodlands are mixed-conifer forests, occurring predominantly in cool ravines and on north-facing slopes. Elevations range from 4,000 to 10,500 feet. Occurrences of this system are found on cooler and more mesic sites than Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland. Such sites include lower and middle slopes of ravines, along stream terraces, moist, concave topographic positions and north- and east-facing slopes which burn somewhat infrequently. Naturally occurring fires are of variable return intervals, and mostly light, erratic, and infrequent due to the cool, moist conditions.

The inter-mountain basins aspen-mixed conifer forest and woodland ecological system occurs on montane slopes and plateaus at elevations ranging from 5,500 to 9,000 feet. Occurrences are typically on gentle to steep slopes on any aspect, but are often found on clay-rich soils in intermontane valleys. Soils are derived from alluvium, colluvium and residuum from a variety of parent materials, but most typically occur on sedimentary rocks. Distribution of this ecological system is primarily limited by adequate soil moisture required to meet its high evapotranspiration demand (Mueggler 1988). Secondarily, its range is limited by the length of the growing season; or low temperatures (Mueggler 1988). At lower elevations aspen is restricted by lack of moisture and is found on cooler north aspects and mesic microsites. The soils are typically deep and well-developed with rock often absent from the soil. Soil texture ranges from sandy loam to clay loams. Parent materials are variable and may include sedimentary, metamorphic or igneous rocks, but it appears to grow best on limestone, basalt, and calcareous or neutral shales (Mueggler 1988). Most occurrences at present represent a late-seral stage of aspen changing to a pure conifer occurrence. Nearly a hundred years of fire suppression and livestock grazing have converted much of the pure aspen occurrences to the present-day aspen-conifer forest and woodland ecological system.

Vegetation: Vegetation in the aspen forest and woodland have a somewhat closed canopy of trees of 15-65 feet tall dominated by the cold deciduous, broad-leaved tree *Populus tremuloides*. Conifers that may be present but never codominant include *Abies concolor, Abies lasiocarpa, Picea engelmannii, Picea pungens, Pinus ponderosa*, and *Pseudotsuga menziesii*. Conifer species may contribute up to 15% of the tree canopy before the occurrence is reclassified as a mixed occurrence. Because of the open growth form of *Populus tremuloides*, enough light can

penetrate for lush understory development. Depending on available soil moisture and other factors like disturbance, the understory structure may be complex with multiple shrub and herbaceous layers, or simple with just an herbaceous layer. The herbaceous layer may be dense or sparse, dominated by graminoids or forbs. Common shrubs include *Acer glabrum, Amelanchier alnifolia, Artemisia tridentata, Juniperus communis, Prunus virginiana, Rosa woodsii, Shepherdia canadensis, Symphoricarpos oreophilus*, and the dwarf-shrubs *Mahonia repens* and *Vaccinium* spp. The herbaceous layers may be lush and diverse. Common graminoids may include *Bromus carinatus, Calamagrostis rubescens, Carex siccata (= Carex foenea), Carex geyeri, Carex rossii, Elymus glaucus, Elymus trachycaulus, Festuca thurberi*, and *Hesperostipa comata*. Associated forbs may include *Achillea millefolium, Eucephalus engelmannii (= Aster engelmannii), Delphinium* spp., *Geranium viscosissimum, Heracleum sphondylium, Ligusticum filicinum, Lupinus argenteus, Osmorhiza berteroi (= Osmorhiza chilensis), Pteridium aquilinum, Rudbeckia occidentalis, Thalictrum fendleri, Valeriana occidentalis, Wyethia amplexicaulis*, and many others. Exotic grasses such as the perennials *Poa pratensis* and *Bromus inermis* and the annual *Bromus tectorum* are often common in occurrences disturbed by grazing.

Vegetation in the montane dry-mesic mixed conifer forest and woodland is comprised of mixed conifer forests at montane elevation. The four main alliances in this system are found on slightly different, but intermingled, biophysical environments: *Abies concolor* dominates at higher, colder locations; *Picea pungens* represents mesic conditions; *Pseudotsuga menziesii* dominates intermediate zones. As many as seven conifers can be found growing in the same occurrences, with the successful reproduction of the diagnostic species determining the association type. Common conifers include *Pinus ponderosa, Pinus flexilis, Abies lasiocarpa, Abies lasiocarpa, Juniperus scopulorum*, and *Picea engelmannii*. *Populus tremuloides* is often present as intermingled individuals in remnant aspen clones, or in adjacent patches. The composition and structure of overstory is dependent upon the temperature and moisture relationships of the site, and the successional status of the occurrence (DeVelice et al. 1986, Muldavin et al. 1996).

A number of cold-deciduous shrub and graminoid species are found in many occurrences (e.g., *Arctostaphylos uvaursi, Mahonia repens, Paxistima myrsinites, Symphoricarpos oreophilus, Jamesia americana, and Quercus gambelii*). Other important species include *Acer glabrum, Acer grandidentatum, Amelanchier alnifolia, Arctostaphylos patula, Holodiscus dumosus, Jamesia americana, Juniperus communis, Physocarpus monogynus, Quercus X pauciloba, Rubus parviflorus*, and *Vaccinium myrtillus*. Where soil moisture is favorable, the herbaceous layer may be quite diverse, including graminoids *Bromus ciliatus (= Bromus canadensis), Calamagrostis rubescens, Carex geyeri, Carex rossi, Carex siccata (= Carex foenea), Festuca occidentalis, Koeleria macrantha, Muhlenbergia montana, Muhlenbergia virescens, Poa fendleriana, Pseudoroegneria spicata*, and forbs *Achillea millefolium, Arnica cordifolia, Erigeron eximius, Fragaria virginiana, Linnaea borealis, Luzula parviflora, Osmorhiza berteroi, Packera cardamine (= Senecio cardamine), Thalictrum occidentale, Thalictrum fendleri, Thermopsis rhombifolia, Viola adunca*, and species of many other genera, including *Lathyrus, Penstemon, Lupinus, Vicia, Arenaria, Galium*, and others.

Vegetation in the inter-mountain basins aspen-mixed conifer forest and woodland is open to moderately closed, mixed evergreen needle-leaved and deciduous broad-leaved tree canopy is composed of short to moderately tall trees, and is codominated by *Populus tremuloides* and conifers, including *Pseudotsuga menziesii, Abies concolor, Abies lasiocarpa, Picea engelmannii,*

Picea pungens, Pinus contorta, Pinus flexilis, and *Pinus ponderosa*. As the occurrences age, *Populus tremuloides* is slowly reduced until the conifer species becomes dominant (Mueggler 1988). The sparse to moderately dense understory may be structurally complex and includes tall-shrub, short-shrub and herbaceous layers, or simple with just an herbaceous layer. Because of the open growth form of *Populus tremuloides*, more light can penetrate the canopy than in a pure conifer occurrence. Typically the understory is usually denser in younger occurrences that are dominated by *Populus tremuloides*, and in more mesic sites with open canopies. If present the tall-shrub layer may be dominated by *Amelanchier alnifolia, Prunus virginiana*, or *Acer grandidentatum*, and short-shrub by *Symphoricarpos oreophilus, Juniperus communis*, or *Mahonia repens*. Other common shrubs include *Paxistima myrsinites, Rosa woodsii, Spiraea betulifolia, Symphoricarpos albus*, and in wet areas *Salix scouleriana*. Where dense, the herbaceous layer is often dominated by graminoids such as *Bromus carinatus, Calamagrostis rubescens, Carex geyeri, Elymus glaucus, Poa* spp., and *Stipa* spp. More sparse herbaceous layers are generally a more even mixture of forbs like *Achillea millefolium, Arnica cordifolia, Eucephalus engelmannii (= Aster engelmannii), Erigeron speciosus, Fragaria vesca, Galium boreale, Geranium viscosissimum, Lathyrus* spp., *Lupinus argenteus, Mertensia arizonica, Mertensia lanceolata, Maianthemum stellatum, Osmorhiza berteroi (= Osmorhiza chilensis)*, and *Thalictrum fendleri*. Annuals are typically uncommon. The exotic species *Poa pratensis* and *Taraxacum officinale* are more common in livestock-impacted occurrences (Mueggler 1988).

Dynamics: Occurrences of the aspen forest and woodland ecological system often originate, and are likely maintained, by stand-replacing disturbances such as crown fire, disease and windthrow, or clearcutting by man or beaver. The stems of these thinbarked, clonal trees are easily killed by ground fires, but they can quickly and vigorously resprout in densities of up to 30,000 stems per hectare (Knight 1993). The stems are relatively short-lived (100-150 years), and the occurrence will succeed to longer-lived conifer forest if undisturbed. Occurrences are favored by fire in the conifer zone (Mueggler 1988). With adequate disturbance a clone may live many centuries. Although *Populus tremuloides* produces abundant seeds, seedling survival is rare because of the long moist conditions required to establish are rare in the habitats that it occurs in. Superficial soil drying will kill seedlings (Knight 1993).

Within the subalpine dry-mesic spruce-fir forest and woodlands *engelmannii* can be very long-lived, reaching 500 years of age. *Abies lasiocarpa* decreases in importance relative to *Picea engelmannii* with increasing distance from the region of Montana and Idaho where maritime air masses influence the climate. Fire is an important disturbance factor, but fire regimes have a long return interval and so are often stand-replacing. *Picea engelmannii* can rapidly recolonize and dominate burned sites, or can succeed other species such as *Pinus contorta* or *Populus tremuloides*. Due to great longevity, *Pseudotsuga menziesii* may persist in occurrences of this system for long periods without regeneration. Old-growth characteristics in *Picea engelmannii* forests will include treefall and windthrow gaps in the canopy, with large downed logs, rotting woody material, tree seedling establishment on logs or on mineral soils unearthed in root balls, and snags.

Forests in the montane dry-mesic mixed conifer forest and woodland represent the gamut of fire tolerance. Formerly, *Abies concolor* in the Utah High Plateaus were restricted to rather moist or less fire-prone areas by frequent ground fires. These areas experienced mixed fire severities, with patches of crowning in which all trees are killed, intermingled with patches of underburn in which larger *Abies concolor* survived. With fire suppression, *Abies concolor* has vigorously

colonized many sites formerly occupied by open *Pinus ponderosa* woodlands. These invasions have dramatically changed the fuel load and potential behavior of fire in these forests. In particular, the potential for high-intensity crown fires on drier sites now codominated by *Pinus ponderosa* and *Abies concolor* has increased. Increased landscape connectivity, in terms of fuel loadings and crown closure, has also increased the potential size of crown fires. *Pseudotsuga menziesii* forests are the only true 'fire-tolerant' occurrences in this ecological system. *Pseudotsuga menziesii* forests were probably subject to a moderate-severity fire regime in presettlement times, with fire-return intervals of 30-100 years. Many of the important tree species in these forests are fire-adapted (*Populus tremuloides, Pinus ponderosa, Pinus contorta*) (Pfister et al. 1977), and fire-induced reproduction of *Pinus ponderosa* can result in its continued codominance in *Pseudotsuga menziesii* forests (Steele et al. 1981). Seeds of the shrub *Ceanothus velutinus* can remain dormant in forest occurrences for 200 years (Steele et al. 1981) and germinate abundantly after fire, competitively suppressing conifer seedlings. Successional relationships in this system are complex. *Pseudotsuga menziesii* is less shade-tolerant than many northern or montane trees such as *Tsuga heterophylla, Abies concolor, Picea engelmannii*, and seedlings compete poorly in deep shade. At drier locales, seedlings may be favored by moderate shading, such as by a canopy of *Pinus ponderosa*, which helps to minimize drought stress. In some locations, much of these forests have been logged or burned during European settlement, and present-day occurrences are second-growth forests dating from fire, logging, or other occurrence-replacing disturbances (Mauk and Henderson 1984, Chappell et al. 1997). *Picea pungens* is a slow-growing, long-lived tree which regenerates from seed (Burns and Honkala 1990a). Seedlings are shallow-rooted and require perennially moist soils for establishment and optimal growth. *Picea pungens* is intermediate in shade tolerance, being somewhat more tolerant than *Pinus ponderosa* or *Pseudotsuga menziesii*, and less tolerant than *Abies lasiocarpa* or *Picea engelmannii*. It forms late-seral occurrences in the subhumid regions of the Utah High Plateaus. It is common for these forests to be heavily disturbed by grazing or fire. In general, fire suppression has lead to the encroachment of more shade-tolerant, less fire-tolerant species (e.g., climax) into occurrences and an attendant increase in landscape homogeneity and connectivity (from a fuels perspective). This has increased the lethality and potential size of fires.

Within the inter-mountain basins aspen-mixed conifer forest and woodland *Populus tremuloides* is thin-barked and readily killed by fire. It is a fire-adapted species that generally needs a large disturbance to establish and maintain dominance in a forest. These mixed forests are generally seral and, in the absence of stand-replacing disturbance such as fire, will slowly convert to a conifer-dominated forest (Mueggler 1988). The natural fire-return interval is approximately 20 to 50 years for seral occurrences (USFS 1996). Intervals that approach 100 years are typical of late-seral occurrences (USFS 1996). Although the young conifer trees in these occurrences are susceptible to fire, older individuals develop self-pruned lower branches and develop thick corky bark that makes them resistant to ground fires. Most of the occurrences sampled by Mueggler (1988) have had a history of livestock grazing as evidenced by relative abundance of the exotic plants *Taraxacum officinale, Poa pratensis*, and other grazing-tolerant plants, and the scarcity of grazing-susceptible plants (Mueggler 1988). Most occurrences that we see today represent a late-seral stage of aspen changing to a pure conifer occurrence. Nearly a hundred years of fire suppression and livestock grazing have converted much of the pure aspen occurrences to the present-day aspen-conifer forest and woodland ecological system.

Desired Future Condition: It will be difficult to provide detailed DFC's for each of the individual components of this grouping. For specific questions and project level activities the Ecological Site Guides should be consulted, along with an understanding of the dynamics of these systems.

However, in general the DFC for vegetation communities within these various groups should consist of mixed conifer stands and an array of age classes, structure, and densities. Tree planting should occur following disturbance to restore or rehabilitate the forest resource to promote forest regeneration. Treatments should result in a landscape containing patches of large old trees.

S.3.9 RIPARIAN / WETLANDS

Corresponding SW ReGAP Landcover Classification:

- S093 - Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- S102 - Rocky Mountain Alpine-Montane Wet Meadow

Environment: Riparian/wetland systems are found throughout the Rocky Mountain and Colorado Plateau regions within a broad elevation range from approximately 2,950 to 9,100 feet. These systems often occur as a mosaic of multiple communities that are often tree-dominated with a diverse shrub and grass component. Riparian areas are typically dependent on a natural hydrologic regime, especially annual to episodic flooding. Wetland areas typically dependent upon continuous saturation or inundation of soils to support wetland obligate species. Occurrences are found within the flood zone of rivers, on islands, sand or cobble bars, and immediate streambanks. They can form large, wide occurrences on mid-channel islands in larger rivers or narrow bands on small, rocky canyon tributaries and well-drained benches. Wetland areas are typically found in backwater channels and other perennially wet but less scoured sites, such as floodplains swales and irrigation ditches. Both riparian and wetland systems may also occur in upland areas of mesic swales and hillslopes below seeps and springs.

The climate of riparian/wetland systems is continental with typically cold winters and hot summers. Surface water is generally high for variable periods. Soils are typically alluvial deposits of sand, clays, silts and cobbles that are highly stratified with depth due to flood scour and deposition. Highly stratified profiles consist of alternating layers of clay loam and organic material with coarser sand or thin layers of sandy loam over very coarse alluvium. Soils are often fine-textured with organic material over coarser alluvium. Some soils are more developed due to a slightly more stable environment and greater input of organic matter.

Riparian/wetland areas commonly contain specialized vegetation associated with surface or subsurface moisture. Riparian resources include wetland areas which require prolonged saturation of soils and contain certain vegetative species dependent upon saturation. Less than 2 percent of the Moab FO planning area contains riparian/wetland resources, which are commonly located along major rivers, drainages, or spring sites

Moisture for wet meadow community types is acquired from groundwater, stream discharge, overland flow, overbank flow, and on-site precipitation. Salinity and alkalinity are generally low due to the frequent flushing of moisture through the meadow. Depending on the slope, topography, hydrology, soils and substrate, intermittent, ephemeral, or permanent pools may be present. These areas may support species more representative of purely aquatic environments. Standing water may be present during some or all of the growing season, with water tables

typically remaining at or near the soil surface. Fluctuations of the water table throughout the growing season are not uncommon, however. On drier sites supporting the less mesic types, the late-season water table may be one meter or more below the surface. Soils typically possess a high proportion of organic matter, but this may vary considerably depending on the frequency and magnitude of alluvial deposition (Kittel et al. 1998). Organic composition of the soil may include a thin layer near the soil surface or accumulations of highly sapric material of up to 120 cm thick. Soils may exhibit gleying and/or mottling throughout the profile. Wet meadow ecological systems provide important water filtration, flow attenuation, and wildlife habitat functions.

Vegetation: Dominant trees may include *Acer negundo*, *Populus angustifolia*, *Populus balsamifera*, *Populus deltoides*, *Populus fremontii*, *Salix amygdaloides*, *Salix goodingii*, *Fraxinus velvutina*, or *Celtis* sp. Dominant shrubs include *Acer glabrum*, *Alnus incana*, *Betula occidentalis*, *Cornus sericea*, *Crataegus rivularis*, *Forestiera pubescens*, *Prunus virginiana*, *Rhus trilobata*, *Salix monticola*, *Salix drummondiana*, *Salix exigua*, *Salix irrorata*, *Salix lucida*, *Shepherdia argentea*, or *Symphoricarpos* spp. Invasive vegetation is common within riparian areas, consisting of exotic trees (*Elaeagnus angustifolia*, *Tamarix* spp). dominant in many stands, and noxious species (*Acroptilon repens*, *Lythrum salicaria*) Generally, the upland vegetation surrounding this riparian system is different and definable and ranges from grasslands to forests and can include *Quercus gambelii*, *Pseudotsuga menziesii*, *Picea pungens*, *Juniperus scopulorum*, *Atriplex canescens* and *Chrysothamnus nauseosus*.

Grass communities and species are a major component in most riparian and wetland areas. A mix of grasses can normally be found, with wide variability in the number of species, extent or location within the riparian/wetland area. Depending on the degree of inundation or saturation, grasses can include obligate wetland species where sufficient saturation occurs yearlong (*Juncus bufonius*, *Scirpus* spp., *Carex* spp., *Typha* spp.); facultative wetland grasses (*Distchlis spicata*, *Phragmites* spp.); or upland grass species (*Oryzopsis*,spp., *Sporobolus* spp.).

Dynamics: This ecological system contains early-, mid- and late-seral riparian plant associations. It also contains non-obligate riparian species. Cottonwood communities are early-, mid- or late-seral, depending on the age class of the trees and the associated species of the occurrence (Kittel et al. 1998). Cottonwoods, however, do not reach a climax stage as defined by Daubenmire (1952). Mature cottonwood occurrences do not regenerate in place, but regenerate by "moving" up and down a river reach. Over time a healthy riparian area supports all stages of cottonwood communities (Kittel et al. 1999b). Riparian ecosystems are extremely susceptible to fire, containing native woody species which are fire intolerant (*Populus fremontii*), often resulting in catastrophic loss to fire in response to exotic species including tamarisk.

Associations in this ecological system are adapted to soils that may be flooded or saturated throughout the growing season. They may also occur on areas with soils that are only saturated early in the growing season, or intermittently. Typically these associations are tolerant of moderate-intensity ground fires and late-season livestock grazing (Kovalchik 1987). Most appear to be relatively stable types, although in some areas these may be impacted by intensive livestock grazing.

Desired Future Condition: The DFC for riparian/wetland areas is to support the appropriate ecological conditions, composition and age-class of native communities to maintain a healthy and properly functioning ecosystem as identified by Utah BLM Standards and Guidelines.

Proper management and restoration of native riparian/wetland is a primary goal where systems are degraded. Reduction of flammable tamarisk and other invasive species can be common and widespread to improve native diversity, functioning condition, and reduce fire hazards.

Apply high priority to suppression of wildfires within riparian/wetland areas to maintain diverse native communities and reduce erosion into adjacent waterways (maintain buffer strips). Limit use of fire retardants near waters to reduce contamination of water quality and fisheries resources. Consider active restoration options, when native riparian and wetland communities are unlikely to recover with passive restoration (due to invasive species, stream bank erosion, etc).

Restore native riparian and wetland species through adjustment of management practices and/or implementation of mechanical, chemical, biological and fire treatments. Mechanical treatment as the initial fire treatment would be emphasized where there is a moderate to high potential for riparian and wetland to be burned to a high severity. For prescribed fire, allow low intensity fire to back into riparian and wetland areas through ignition outside of riparian and wetland.

S.3.10 INVASIVES

Corresponding SW ReGAP Landcover Classification:

- D04 - Invasive Southwest Riparian Woodland and Shrubland
- D08 - Invasive Annual Grassland

Environment: Invasive species can occur in nearly any environment within the Moab Field Office, however the major occurrences are in lower elevations (<6,500 feet). The major native vegetation types that have been displaced by invasives are salt desert scrub, sagebrush and grasslands. Observations indicate they are found to a greater extent in areas that have been disturbed by natural events or management activities. Drought also plays a key role in distribution of these species by limiting competition from native species for moisture.

This category does not include exotic species such as tamarisk or Russian olive, nor does it include other types of listed weeds which occur in smaller patches.

Vegetation: Within the distribution of vegetation normally associated with grasslands, salt desert scrub and sagebrush communities, the primary invasive species present include: Bromus spp., Salsola spp. and Halogeton glomeratus.

Dynamics: The invasives share the overall system dynamic features of the communities they occur in, and in some cases can be primary system dynamic drivers once established. The invasives take advantage of moisture earlier in the year than most native species, in some instances they alter soil characteristics of a site to favor nutrient uptake, both to the point of becoming dominate in the system they occur within. Fire and other management tools can often invigorate growth rates for these species. The complete role of invasives and their relationship to disturbance is not conclusive, but large scale occurrences with areas of certain types and intensities of management overuse or natural disturbance events, particularly on saline soil types, seems to indicate a strong link.

Cheat Grass Dynamics: Cheatgrass or downy brome (*Bromus tectorum* L.) is a winter annual C_3 grass that is self-pollinating (McKone 1985, Allen & Meyer 2002). Cheatgrass normally germinates in the fall, but seeds germinate at other times of year as well (Mack 1981). Seedlings that emerge in the fall develop a rudimentary root and shoot system that remains quiescent

during the winter. Cheatgrass begins rapidly growing in late winter and early spring with warmer night and daytime temperatures and reaches full vegetative and reproductive maturity over a period of 6 to 8 weeks (Mack & Pyke 1983, Pierson & Mack 1990). These life history traits, especially rapid growth and corresponding depletion of soil water and N, which results in lower resource availability for perennial neighbors (Gordon et al. 1989, Welker et al. 1991), have contributed to the success of cheatgrass. Cheatgrass has large impacts on plant communities and ecosystems. It has been implicated in increasing fire frequencies and intensities (Klemmedson & Smith 1964, Stewart & Hull 1949, Knick & Rotenberry 1997), which has led to its replacement of shrubs and perennial grasses (DiTomaso 2000). It is the most ubiquitous weed in steppe vegetation in Western North America (Mack 1981). Cheatgrass is known to have negative effects on native species through competition, reducing establishment and growth of native perennial grasses (Harris 1967, Young & Evans 1985, Svejcar 1990, Rafferty and Young 2002). Cheatgrass can change N dynamics in ecosystems (Paschke et al. 2000, Evans et al. 2001) and its dominance can alter the composition of microbial communities (Belnap and Phillips 2001, Al-Qarawi 2002, Kuske et al. 2002), which can result in loss of plant species diversity (van der Heijden et al. 1998). Land managers report that cheatgrass now occurs at elevations where it was not found in the past.

Desired Future Condition: Where invasive species are present or in areas determined to be at risk, the DFC is to control this spread and take actions to restore the native vegetation community that has been invaded. Fires in cheatgrass invaded areas or areas with high potential for invasion should be aggressively suppressed and aggressively rehabilitated following wildfire. Wildland fire use would not be appropriate in cheatgrass/halogeton-invaded sites or in areas with high potential for invasion because of the lack of ability to properly rehabilitate.

S.3.11 DISTURBED AREAS

Corresponding SW ReGAP Landcover Classification:

- D11 - Recently Chained Pinyon-Juniper Areas

Environment: These mapped areas consist predominantly of management treatment areas for pinyon-juniper and sagebrush control that have occurred over the past 50 years. They typically occur on flat to gentle terrain. In some cases the treatment has been maintained, in other case the pinyon-juniper or sage has returned to varying degrees of success.

Vegetation: In those areas where the treatments were successful, the predominant vegetation consists of various grasses, crested wheat grass in many instances, and various forbs and shrubs. In less successful areas, the vegetation treated for has retuned and in some instances the areas have been subject to invasive species spread.

Dynamics: Over time many of these treatment areas have not been maintained with proper tools such as fire or herbicide. In some cases livestock were allowed onto the treated areas too early which altered the preferred vegetation composition.

Desired Future Condition: The assumption is made that since time and funding were invested to conduct these treatment operations, there would be interest in seeing the treatments maintained. The desired future condition for these treatments should therefore be the same as the rationale for initiating the treatment. In some instances species composition may need to be

altered through re-seeding, in other areas recruitment of new woody species may require fire to reduce recruitment to acceptable levels.

DFC Table: Moab RMP Desired Future Conditions (DFC) - Vegetative Community Analysis Groupings[1]

Vegetation Groupings from Draft Utah FMP	Land Cover Groupings from Southwest ReGAP Analysis Occurring within Moab FO Boundaries	Final Grand RMP DFC Vegetation Community Groupings and Associated SW ReGAP Cover Types and Utah FMP Vegetation Groupings		Acres
Salt Desert Scrub Pinyon and Juniper Woodland Sagebrush Grassland Blackbrush Mountain Shrub Mixed Conifer Ponderosa Pine Creosote Bursage[2] Riparian Wetland Aspen[3]	D01 - Disturbed, non-specific D02 - Recently burned D03 - Recently mined or quarried D04 - Invasive Southwest Riparian Woodland and Shrubland D06 - Invasive Perennial Grassland D08 - Invasive Annual Grassland D09 - Invasive Annual and Biennial Forbland D10 - Recently Logged Areas D11 - Recently Chained Pinyon-Juniper Areas D14 - Disturbed, Oil Well N21 - Developed, Open Space—Low Intensity N22 - Developed, Medium – High Intensity N80 - Agriculture S002 - Rocky Mountain Alpine Bedrock and Scree S006 - Rocky Mountain Cliff and Canyon S010 - Colorado Plateau Mixed Bedrock Canyon and Tableland S011 - Inter-Mountain Basins Shale Badland S012 - Inter-Mountain Basins Active and Stabilized Dune S023 - Rocky Mountain Aspen Forest and Woodland S028 - Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland S030 - Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland S032 - Rocky Mountain Montane Dry- Mesic Mixed Conifer	**Salt Desert Scrub**	S011 - Inter-Mountain Basins Shale Badland S045 - Inter-Mountain Basins Mat Saltbush Shrubland S065 - Inter-Mountain Basins Mixed Salt Desert Scrub S079 - Inter-Mountain Basins Semi-Desert Shrub Steppe S096 - Inter-Mountain Basins Greasewood Flat	648,817
		Pinyon and Juniper Woodland	S039 - Colorado Plateau Pinyon-Juniper Woodland S052 - Colorado Plateau Pinyon-Juniper Shrubland S010 - Colorado Plateau Mixed Bedrock Canyon and Tableland	1,111,114
		Sagebrush	S054 - Inter-Mountain Basins Big Sagebrush Shrubland S056 - Colorado Plateau Mixed Low Sagebrush Shrubland S071 - Inter-Mountain Basins Montane Sagebrush Steppe	273,242
		Grassland	S090 - Inter-Mountain Basins Semi-desert Grassland	61,087
		Blackbrush	S059 - Colorado Plateau Blackbrush-Mormon Tea Shrubland	254,509

DFC Table: Moab RMP Desired Future Conditions (DFC) - Vegetative Community Analysis Groupings[1]

Vegetation Groupings from Draft Utah FMP	Land Cover Groupings from Southwest ReGAP Analysis Occurring within Moab FO Boundaries	Final Grand RMP DFC Vegetation Community Groupings and Associated SW ReGAP Cover Types and Utah FMP Vegetation Groupings		Acres
	Forest and Woodland S034 - Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland S036 - Rocky Mountain Ponderosa Pine Woodland S039 - Colorado Plateau Pinyon-Juniper Woodland S042 - Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland S045 - Inter-Mountain Basins Mat Saltbush Shrubland S046 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland S047 - Rocky Mountain Lower Montane-Foothill Shrubland S052 - Colorado Plateau Pinyon-Juniper Shrubland S054 - Inter-Mountain Basins Big Sagebrush Shrubland S056 - Colorado Plateau Mixed Low Sagebrush Shrubland S059 - Colorado Plateau Blackbrush-Mormon Tea Shrubland S065 - Inter-Mountain Basins Mixed Salt Desert Scrub S071 - Inter-Mountain Basins Montane Sagebrush Steppe S079 - Inter-Mountain Basins Semi-Desert Shrub Steppe S083 - Rocky Mountain Subalpine Mesic Meadow S085 – Southern Rocky Mountain Montane-Subalpine Grassland S090 - Inter-Mountain Basins Semi-desert Grassland S093 - Rocky Mountain Lower Montane Riparian Woodland and Shrubland S096 - Inter-Mountain Basins Greasewood Flat S102 - Rocky Mountain Alpine-Montane Wet Meadow	**Mixed Conifer**	S023 - Rocky Mountain Aspen Forest and Woodland S028 - Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland S030 - Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland S032 - Rocky Mountain Montane Dry- Mesic Mixed Conifer Forest and Woodland S034 - Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland S042 - Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	173,169
		Ponderosa Pine	S036 - Rocky Mountain Ponderosa Pine Woodland	20,347
		Riparian Wetland	S093 - Rocky Mountain Lower Montane Riparian Woodland and Shrubland S102 - Rocky Mountain Alpine-Montane Wet Meadow	36,000
		Disturbed Areas	D11 - Recently Chained Pinyon-Juniper Areas	19,730
		Invasives	D04 - Invasive Southwest Riparian Woodland and Shrubland D08 - Invasive Annual Grassland	43,230
		Dunes	S012 - Inter-Mountain Basins Active and Stabilized Dune S136 - Southern Colorado Plateau Sand Shrubland	28,022

DFC Table: Moab RMP Desired Future Conditions (DFC) - Vegetative Community Analysis Groupings[1]

Vegetation Groupings from Draft Utah FMP	Land Cover Groupings from Southwest ReGAP Analysis Occurring within Moab FO Boundaries	Final Grand RMP DFC Vegetation Community Groupings and Associated SW ReGAP Cover Types and Utah FMP Vegetation Groupings		Acres
	S136 - Southern Colorado Plateau Sand Shrubland	**Mountain Shrub**	S046 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland S047 - Rocky Mountain Lower Montane-Foothill Shrubland	159,292

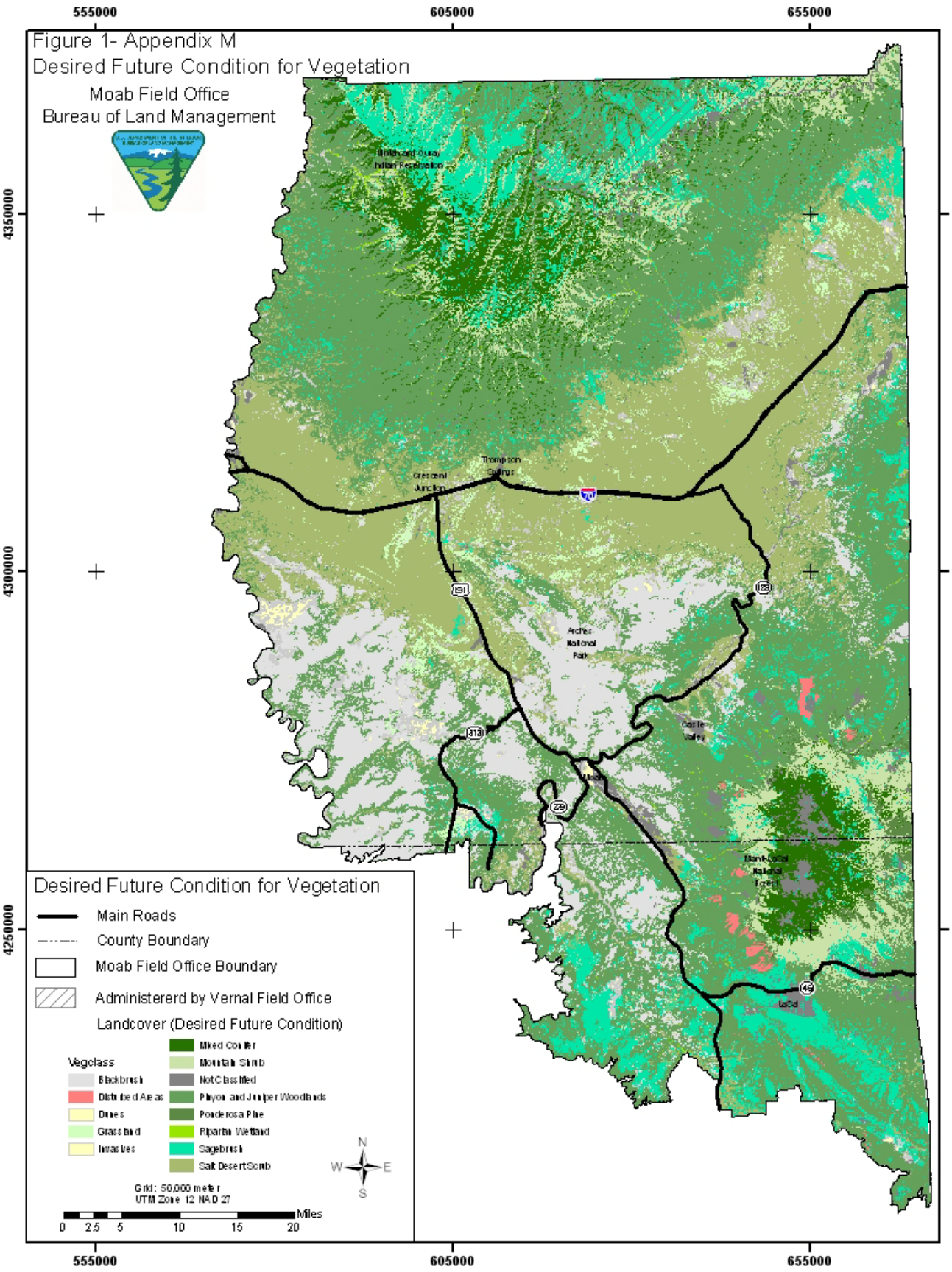
[1] The following SW ReGAP classification covers will not be used for RMP DFC because they do not occur in sufficient distribution to be considered, or occur on lands administered by another agency.

D01 - Disturbed, non-specific
D02 - Recently burned
D03 - Recently mined or quarried
D06 - Invasive Perennial Grassland
D09 - Invasive Annual and Biennial Forbland
D10 – Recently logged areas
D14 - Disturbed, oil well
N21 - Developed, Open Space—Low Intensity
N22 - Developed, Medium – High Intensity
N80 - Agriculture
S002 - Rocky Mountain Alpine Bedrock and Scree
S006 - Rocky Mountain Cliff and Canyon
S083 - Rocky Mountain Subalpine Mesic Meadow
S085 – Southern Rocky Mountain Montane-Subalpine Grassland

[2] Creosote Bursage does not occur in the Moab Field Office.

[3] Aspen within the Moab Field Office is relatively small aerial extent and is grouped with the mixed conifer community.

Note: Appendix M referred to on map is now Appendix S in this document.



APPENDIX T.

DROUGHT CLASSIFICATION SYSTEM

Drought intensity categories are based on six key indicators and numerous supplementary indicators. The accompanying drought severity classification table shows the ranges for each indicator for each dryness level. Because the ranges of the various indicators often do not coincide, the final drought category is based on what the majority of the indicators show. The analysts producing the map also weight the indices according to how well they perform in various parts of the country and at different times of the year.

Also, additional indicators are often needed in the West, where winter snowfall has a strong bearing on water supplies.

D0-D4: The Drought Monitor summary map identifies general drought areas, labeling droughts by intensity, with D1 being the least intense and D4 being the most intense. Drought watch areas (D0) are either drying out and possibly heading for drought, or are recovering from drought but not yet back to normal - suffering long-term impacts such as low reservoir levels.

Table T.1 Drought Severity Classifications

Category	Description	Possible Impacts	Palmer Drought Index	CPC Soil Moisture Model (Percentiles)
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures; fire risk above average. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered.	-1.0 to -1.9	21-30
D1	Moderate Drought	Some damage to crops, pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-2.0 to -2.9	11-20
D2	Severe Drought	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-3.0 to -3.9	D2
D3	Extreme Drought	Major crop/pasture losses; extreme fire danger; widespread water shortages or restrictions.	-4.0 to -4.9	D3
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells, creating water emergencies.	-5.0 or less	

Additional indices used, mainly during the growing season, include the USDA/NASS Topsoil Moisture, Crop Moisture Index (CMI), and Keetch Byram Drought Index (KBDI). Indices used primarily during the snow season and in the West include the River Basin Snow Water Content, River Basin Average Precipitation, and the Surface Water Supply Index (SWSI).

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APPENDIX U.

ADDITIONAL WILDLIFE INFORMATION

U.1 HABITAT MANAGEMENT PLANS

U.1.1 CISCO DESERT HABITAT MANAGEMENT PLAN

The Cisco Desert Habitat Management Plan, signed in September of 1978, was written particularly for pronghorn, and is primarily concerned with the development of water. An Agreement of Cooperation Between UDWR and BLM Moab was signed in August of 1979, agreeing that 1) BLM and UDWR would inspect and fill water developments, 2) BLM and UDWR would install locks and provide keys on water developments, 3) UDWR would provide BLM population trend data, distribution, and population estimates for the Cisco herd unit, 4) BLM would provide fecal analysis study results to UDWR. The UDWR and the BLM also agreed that a reasonable population goal after completion of phase one would be 350 to 400 pronghorn and after a two year evaluation the BLM and UDWR would jointly agree on reasonable numbers during phases two and three of the plan.

Under this HMP, 242,560 acres of land administered by the BLM were to be improved to provide habitat capable of supporting at least 350 to 400 pronghorn after the completion of phase one and up to 750 adult pronghorn year-round upon completion of projects. These numbers would be attained through habitat management and natural reproductive processes. Eleven specific management objectives were established and were to be implemented in three stages as follows:

Phase One focused on the eastern third of the HMP area:

1. Improve 70,000 acres of pronghorn habitat on the eastern third of the HMP area by developing reliable water sources to provide water for approximately 400 pronghorn.
2. On the eastern third of the HMP area modify or remove fences in areas that do not meet BLM specifications for fencing on pronghorn range.
3. Determine the similarity of diet of domestic livestock, pronghorn and mule deer utilizing the 242,560 acres of the HMP.
4. Establish six seeding study plots in greasewood and shad scale vegetation types within HMP area to determine the suitability of these types of browse and forb introduction.

Phase Two focused on the central third of the HMP area:

1. Improve 86,000 acres of pronghorn habitat on the central third of the HMP area by developing reliable water sources to provide water for approximately 200 pronghorn.
2. Increase the percent browse and forb species on 6,375 acres of grass vegetation from less the 5% to 30% browse and forb on the central third of the HMP area.

Phase Three focused on the western third of the HMP area:

1. Increase 86,000 acres of pronghorn habitat on the western third of the HMP area by developing reliable water sources to provide water for approximately 150 pronghorn.

2. Improve 86,000 acres of pronghorn habitat on the western third of the HMP area by modification of the Nash Wash Allotment fence to allow pronghorn un-restricted passage.

Other objectives:

1. Improve 1000 acres of pronghorn habitat in wash bottoms by changing the greasewood vegetation to a more palatable species type as indicated by study results obtained from objective four accomplishments.
2. Improve pronghorn habitat by excluding livestock grazing and oil and gas exploration activities from May 15th through June 20th or during extreme snow conditions.
3. Maintain or improve HMP area for pronghorn habitat by insuring the oil and gas, pipeline, fire and other vegetative rehab projects include at lease 30% browse and 30% forb species when re-seeding.

These objectives were to be met by constructing water developments, removing fencing along the Colorado-Utah state line, conducting range and vegetative studies, manipulating vegetation, constructing needed pronghorn fences to protect water developments, changing season of use and restricting oil and gas exploration on kidding grounds to reduce disturbance, using seed mixtures that enhance pronghorn forage on rehab areas and ensuring that all livestock concentration locations (feeding, salting, watering, sheep camps) are not within a half mile of pronghorn water developments.

U.1.2 HATCH POINT HABITAT MANAGEMENT PLAN

The Hatch Point HMP, signed in September of 1976, was intended to benefit 309 pronghorn. A Memorandum of Understanding was signed in 1968 between the BLM and the Utah State Division of Fish and Game (now the UDWR) to transplant 150 pronghorn into this area and allow the population to increase by natural reproduction to whatever the optimum herd size is jointly determined by the BLM and UDWR. Under this HMP, 109,002 acres of land administered by the BLM are to be maintained in good condition and habitat is to be improved where needed. Six specific management objectives were established:

1. a. Maintain the present big sagebrush association at 31% of the total wildlife habitat.

   b. Increase the forb cover within the big sagebrush association in the key areas from less then 1% to 5%.
2. Improve the habitat for pronghorn by eliminating barriers to their movements caused by fencing.
3. Improve pronghorn, sage-grouse and other big game and non-game species habitat by improving year-round water resources on Hatch Point.
4. Improve pronghorn habitat by eliminating livestock grazing on known kidding grounds from May 1st through June 30th.
5. Improve pronghorn, sage-grouse and other game and non-game species habitat by protecting and establishing riparian and succulent forage areas around exiting and proposed water sources.
6. Improve the pronghorn habitat by a change of class of livestock from sheep to cattle on the Hatch Point area. Change of class of livestock from cattle to sheep will be prohibited within this area.

These objectives will be attained through water developments, changes in season of use (November 1st through June 1st), number of livestock (27% reduction), change in livestock class from sheep to cattle, fencing, seeding and rest/rotation. For the rest/rotation to be implemented, three pastures were developed on the Hatch Point Allotment. One pasture was to be grazed from November 1st to March 1st, the second from March 1st to June 1st and the third was to receive a yearlong rest from grazing. Pronghorn kidding areas were to have livestock grazing removed by May 1st and if critical sage-grouse habitat was located, livestock grazing would be excluded within a one-mile radius from these areas from April 1st through June 15th. A total of 69 acres were to be seeded to attain a combination of succulent forbs, grasses and shrubs that would provide spring forage. Fencing was to be a management tool to eliminate livestock grazing from the following projects: a) 10 acres of drainage fenced at the Hatch Point Reservoir; b) 20 acres of drainage fenced at Hatch Point Section 4 Permit Reservoir; c) 3 acres fenced around each Hatch Point catchment.

U.1.3 DOLORES TRIANGLE HABITAT MANAGEMENT PLAN

The Dolores Triangle HMP, signed in November of 1979, was intended for deer, elk, and bighorn sheep, but also has objectives for raptors, waterfowl, and native trout. Under this plan, 100,686 acres of land administered by the BLM are to be improved and maintained by providing food, cover, water and open space. Eight specific management objectives were established:

1. Improve and maintain 100,686 aces of public land to provide:
   a. Winter habitat for 3,500 mule deer from November 1st through May 1st
   b. Year-round habitat for approximately 350 resident mule deer
2. Maintain approximately 20,000 acres of public land within the Dolores Triangle Planning Unit to provide year-round habitat to support 150 desert bighorn sheep.
3. Improve approximately 25,000 acres of public land within the Dolores Triangle Planning Unit to provide winter habitat to support 250 head of Rocky Mountain Elk from November 1st through April 1st.
4. Improve approximately 300 acres of public land within the Dolores Triangle Planning Unit to provide shorebird and waterfowl nesting habitat.
5. Improve approximately 10 miles of aquatic and associated riparian habitat in Granite Creek Canyon to increase self-sustaining brook trout populations
6. Improve approximately 20 miles of aquatic and associated riparian habitat in Coates, Ryan and Renegade Creeks to support a self-sustaining warm-water fish population
7. Improve species diversity of wildlife habitats within planning area by cooperating with both UDWR and USFWS in attempts to re-establish wildlife populations within this area.
8. Enhance bald eagle wintering habitat and non-game habitat along river and stream corridors.

Deer and elk winter habitat were to be improved through chaining, herbicides, prescribe fires, vegetative seeding with mixes to improve browses and forage for wildlife, water developments and improvements. These winter ranges were to be protected from grazing by forage reallocation from and oil and gas disturbance. Bighorn sheep would be supported by improving habitat, reallocating forage, and reducing harassment. The bighorn sheep area would be closed to OHV use by a rock barrier. Bald eagle habitat was to be improved through the installation of fencing and enclosures to protect cottonwoods. Raptor surveys would determine location and density of nesting location so that these areas could be protected from surface disturbances. Quarter mile

buffers would protect nest sites from February 15th through June 1st from oil and gas occupancy. Riparian habitat along Granite, Coates, Ryan, and Renegade Creeks would be improved by installing in-stream structures such as drop structures, log, earth and rock dams, deepening and channelization of stream channels, erosion control with rock and soil berms, and seeding. Riparian areas would be fenced to prevent livestock from entering these areas, helping to improve shorebird and waterfowl nesting habitat. Nest structures were to be installed.

U.1.4 POTASH-CONFLUENCE HABITAT MANAGEMENT PLAN

The Potash-Confluence HMP, signed in June of 1986, was developed from direction established in the Grand RMP. This HMP provides management guidance primarily for desert bighorn sheep, but also includes guidance for chukar partridge, bald eagles, and peregrine falcon. Under this HMP, 278,000 acres of land administered by the BLM are to be maintained in good condition and habitat is to be improved where needed. Eight specific management objectives were established:

1. Improve 42,500 acres of critical bighorn sheep habitat by preventing major human disturbance during lambing and breeding seasons.
2. Provide additional water sources at a minimum spacing of 1 water development in each 2 square mile area on lambing grounds.
3. Adopt fence standards to adequately restrict livestock while providing for free movement of bighorn sheep.
4. Maintain water developments used by bighorn sheep, chukar partridge and other wildlife by providing funding where needed and ensuring that wildlife escape ramps are placed in all water troughs.
5. Assist in the development of livestock manipulation techniques on Horsethief Point, Spring Canyon Bottom, and Ten-Mile Point allotments to improve or maintain bighorn sheep habitat.
6. Change season of use on the Potash allotment to reduce competition on lambing and breeding grounds.
7. Maintain 64,000 areas of cliff habitat to support 4 breeding pairs of peregrine falcon along the Colorado and Green Rivers to achieve as annual production of 10 peregrines by 1990.
8. Protect and maintain 5,000 acres of riparian habitat to provide wintering habitat for bald eagles and support a diversity of game and non-game species.

Human disturbance in critical habitat would be lessened by using protective stipulations for oil and gas leasing, disallowing oil and gas exploration and occupancy, including seismic exploration, controlling filming activities and solid mineral extraction during lambing and rutting seasons. Water developments were to be installed to alleviate conflicts created by human occupancy (recreational and industrial) and to reduce competition between livestock and bighorn for forage, water and space. Most bighorn water developments were installed in areas inaccessible to both people and cattle. This spatial separation lessens the potential for bighorn and people and cattle interaction. The risk of bighorn contacting diseases, which could be carried by the cattle, is also lessened.

U.2 WILDLIFE LAND-USE PLAN AMENDMENTS TO THE 1985 GRAND RMP

U.2.1 BIGHORN SHEEP AMENDMENT TO THE GRAND RMP

An RMP amendment (EA #UT-068-89-036) was completed in 1989 involving the improvement of desert bighorn and Rocky Mountain bighorn habitat. The amendment provided for installation of new water facilities and modified the Grand RMP from supporting current estimated bighorn sheep population of 259 and managing bighorn sheep habitat to support prior stable numbers of 1440 desert bighorn sheep. Population goals would be reached by big games releases, reestablishment, and through change of livestock class. Furthermore, the amendment prevents changes in livestock from cattle to domestic sheep to prevent forage competition and disease transmittal to bighorns. Current allotments grazing domestic sheep were not required to change to cattle. Allotments that were effected by this plan amendment include: Ten Mile Point, Big Flat-Ten Mile, Spring Canyon Bottom, Horsethief Point, Arth's Pasture, Potash, Kane Springs, Rattlesnake, Showerbath Springs, Tusher Wash, Lone Cone, Coal Canyon, Floy Canyon, Horse Canyon, Thompson Canyon, Crescent Canyon, Floy Creek, Little Hole, Lost Canyon-Sugar Bench, Agate, Steamboat Mesa, South Beaver Mesa, Dakota Rock, Dolores Point, Taylor (Fisher Valley), Professor Valley, Ida Gulch, Hotel Mesa, Taylor (Highlands) North River and Hatch Point.

This change will allow desert bighorn sheep populations to also attain their prior stable population level providing that favorable habitat and environmental conditions prevail.

U.2.2 LIVESTOCK GRAZING USE ADJUSTMENTS AMENDMENT TO THE GRAND RMP (1995)

An RMP amendment (EA #UT-068-94-047) was implemented in 1995 which benefited wildlife across much of Moab FO area. The amendment allowed for the removal of cattle from the Bogart, Diamond, Cottonwood, North Sand Flats, South Sand Flats, and Between the Creeks allotments. This action resulted in a retirement of 5,066 BLM AUMs that are now reserved for wildlife, riparian vegetation, watershed and recreational values.

The amendment included the reallocation of cattle grazing privileges in the Cisco, Main Canyon-Middle Canyon, and Arth's pasture allotments to enhance, protect and improve wildlife habitat, riparian vegetation, watershed, and recreation values. These reductions totaled 3,206 AUMs. Main and Middle Canyon were combined and a rest/rotation system implemented, allowing pastures to be rested every third or forth year. AUMs remaining for cattle on the Arth's Pasture allotment were to be actively managed using fencing and herding to benefit desert bighorn sheep, by reducing spatial competition, social intolerance, disease transmittal, and competition for forage and water. These reductions in AUMs are summarized in Table 1:

Table 1: Reductions in Grazing from the 1995 Amendment to the Grand RMP

Allotment	Permitted BLM AUMs	Reallocation of BLM AUMs	Remaining BLM AUMs	Permitted Season of Use
Cisco	4,149	2,330 (56%)	1,819	10/25-6/20
Main Canyon-Middle Canyon	951	451 (47%)	500	6/01-10/30

Table 1: Reductions in Grazing from the 1995 Amendment to the Grand RMP

Allotment	Permitted BLM AUMs	Reallocation of BLM AUMs	Remaining BLM AUMs	Permitted Season of Use
Arth's Pasture	808	425 (53%)	353	11/6-5/17
Bogart	206	206 (100%)	0	
North Sand Flats	797	797 (100%)	0	
South Sand Flats	597	597 (100%)	0	
Between the Creeks	260	260 (100%)	0	
TOTAL	**7,768**	**5,066**	**2,672**	

All livestock AUMs in the Horse Pasture-Nash Wash area of the Cisco allotment were reallocated for use by deer and pronghorn. The domestic sheep grazing that was permitted was redistributed throughout the remaining portion of the Cisco Allotment. Approximately 3 miles of fence was constructed on the unfenced portion to exclude livestock from the Horse Pasture area. The Horse Pasture area is an area where large numbers of deer concentrate during the winter months and is considered to be a crucial deer winter area and competition for forage and space had existed for decades. Wintering deer would no longer have to compete with cattle and domestic sheep for sagebrush and the early spring season grasses. It was hoped that there would be an increase in the deer population resulting from increased reproductive success rates (fawn: doe ratio) through increased forage availability. Any disturbance which had been caused by the presence of sheep dogs, sheep camps and the domestic sheep herd, which may have interfered with deer movement and their use of pinyon-juniper trees for thermal and escape cover, would no longer occur.

Of the 2,330 reallocated AUMs in the Cisco allotment, 500 are specifically for pronghorn habitat enhancement. The additional 500 AUMs of forage specifically allocated for pronghorn should allow the herd to increase by approximately 400 animals. Approximately 300-400 pronghorn could occupy the Cisco Allotment yearlong, except during the winter months when pronghorn gather into large herds. Possibly 600-800 pronghorn could occupy a portion of the Cisco Allotment for a two to three month period.

This RMP Amendments allows for additional flexibility to modify the grazing season of use for individual allotments within the entire Resources Area.

This RMP Amendments allows for the relinquishment of grazing permits and reallocation of forage previously reserved for livestock to non-livestock purposes such as wildlife habitat, riparian vegetation, watershed and recreational values. This would result in partial or complete removal of livestock from specific grazing allotments

U.2.3 Livestock Grazing Use Adjustments Amendment to the Grand RMP on Diamond-Cottonwood Allotments (1996)

An RMP amendment (EA #UT-068-94-047) was implemented in 1996 which benefited wildlife in the Diamond and Cottonwood Allotments. The amendment allowed for the removal of cattle from the Diamond and Cottonwood allotments, resulting in the retirement of 1,491 BLM AUMs.

These AUMs are now reserved for wildlife, riparian vegetation, watershed and recreational values. These reductions in AUMs are summarized in Table 2:

Table 2: Grazing Adjustments in the Diamond and Cottonwood Allotments

Allotment	Permitted BLM AUMs	Reallocation of BLM AUMs	Remaining BLM AUMs
Diamond	590	590 (100%)	0
Cottonwood	901	901 (100%)	0
TOTAL	**1491**	**1491**	**0**

U.3 BIRD HABITAT CONSERVATION AREAS (BHCA)

U.3.1 CISCO DESERT BIRD HABITAT CONSERVATION AREA

199,484 Acres: Low desert Shrub

Species of Concern: Golden Eagle, Ferruginous Hawk, Burrowing Owl, Long-billed curlew

U.3.2 COLORADO & DOLORES RIVERS BIRD HABITAT CONSERVATION AREA

43,393 Acres: Lowland Riparian

Species of Concern: North American Waterfowl, Virginia & Lucy's Warbler, Yellow-breasted Chat, Blue Grosbeak, Yellow-billed Cuckoo, Bald Eagle, Peregrine, Mexican Spotted Owl

U.3.3 GREEN RIVER BIRD HABITAT CONSERVATION AREA

30,110 Acres: Lowland Riparian

Species of Concern: North American Waterfowl, Virginia & Lucy's Warbler, Yellow-breasted Chat, Blue Grosbeak, Yellow-billed Cuckoo, Bald Eagle, Peregrine, Mexican Spotted Owl

U.3.4 COTTONWOOD & WILLOW CREEKS BIRD HABITAT CONSERVATION AREA

38,487 Acres: Lowland Riparian

Species of Concern: Cordilleran & Olive-sided Flycatchers, Mexican Spotted Owl, Virginia & Lucy's Warbler, Broad-tailed Hummingbird, Goshawk, Fox Sparrow, Red-napped Sapsucker, Western Bluebird