

**ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
REDEVELOPMENT OF SIX WATER CATCHMENTS ON THE ARIZONA
STRIP, MOHAVE COUNTY, ARIZONA
(DOI-BLM-AZ-A030-2012-0003-EA)**

Prepared by

**U.S. Department of the Interior
Bureau of Land Management**
Grand Canyon – Parashant National Monument
345 East Riverside Drive
St. George, Utah 84790-6714

May 20, 2013

CONTENTS

1. INTRODUCTION	1
1.1 Background	1
1.2 Purpose and Need	2
1.3 Grand Canyon-Parashant National Monument	10
1.4 Conformance with Land Use Plans	10
1.4.1 Conformance with Grand Canyon-Parashant National Monument Resource Management Plan	10
1.4.2 Consistency with the revised Mt. Trumbull HMP	15
1.5 Relationship to Statutes, Regulations, or Other Plans	15
1.6 Identification of Issues	16
2. PROPOSED ACTION AND ALTERNATIVES	17
2.1 Proposed Action	17
2.1.1 Best Management Practices	19
2.1.2 Monitoring	21
2.2 No Action Alternative	21
2.3 Alternatives Considered but Eliminated from Detailed Analysis	21
2.3.1 Refrain from Replacing the Water Catchments and Discontinue Hauling Water	21
2.3.2 Relocation of Catchments outside of GCPNM	21
3. AFFECTED ENVIRONMENT	23
3.1 Elements/Resources of the Human Environment	24
3.2 Resources Brought Forward for Analysis	27
3.2.1 Vegetation	27
3.2.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species	27
3.2.3 Recreation	31
3.2.4 Visual Resources	31
3.2.5 Cultural Resources	32
4. ENVIRONMENTAL CONSEQUENCES	33
4.1 Environmental Consequences of Proposed Action	33
4.1.1 Vegetation	33
4.1.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species	33
4.1.3 Recreation	36
4.1.4 Visual Resources	37
4.1.5 Cultural Resources	38
4.1.6 Cumulative Impacts of Proposed Action	38
4.2 Environmental Consequences of the No Action Alternative	39
4.2.1 Vegetation	39
4.2.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species	39
4.2.3 Recreation	41
4.2.4 Visual Resources	41
4.2.5 Cultural Resources	41
4.2.6 Cumulative Impacts of the No Action Alternative	41

5. CONSULTATION AND COORDINATION.....	42
5.1 Introduction	42
5.2 Summary of Interagency Participation	42
5.3 List of Contributors and Reviewers.....	444
6. LITERATURE CITED	45
7. APPENDIX A: SITE PHOTOGRAPHS OF EXISTING CATCHMENTS	49
8. APPENDIX B: SCHEMATIC DRAWINGS OF THE PROPOSED CATCHMENTS	52

Tables

1.1. Location of the Six Catchments	2
3.1. Summary Evaluation of Elements/Resources of the Human Environment	24
5.1. List of Comments and Responses/References	42
5.2. List of BLM Preparers/Reviewers	43
5.3. Non-Federal Agency EA Preparers/Reviewers.....	444

Figures

1.1 General location of the existing catchments.....	3
1.2 Catchment No. 9025 location.....	4
1.3 Catchment No. 8051 location.....	5
1.4 Catchment No. 9753 location.....	6
1.5 Catchment No. 9026 location.....	7
1.6 Catchment No. 9029 location.....	8
1.7 Catchment No. 9590 location.....	9

Acronyms and Abbreviations

amsl	above mean sea level
ASFO	Arizona Strip Field Office
AGFD	Arizona Game and Fish Department
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
DFC	Desired Future Conditions
DPC	Desired Plant Community
EA	Environmental Assessment
ESA	Endangered Species Act
GCPNM	Grand Canyon-Parashant National Monument
GMU	Game Management Unit
HMP	Habitat Management Plan
MBTA	Migratory Bird Treaty Act
MP	Management Plan
NEPA	National Environmental Policy Act
RMP	Resource Management Plan
ROS	Recreation Opportunity Spectrum
USC	United States Code
USGS	U.S. Geological Survey
VCR	Visual Contrast Rating
VRM	Visual Resource Management

Chapter 1

INTRODUCTION

1.1 BACKGROUND

The Bureau of Land Management (BLM), in cooperation with the Arizona Game and Fish Department (AGFD), proposes to make improvements to, and redevelop, six existing water catchments (Table 1.1) in northwestern Arizona on the Arizona Strip within AGFD Game Management Units (GMU) 13A and 13B. The Arizona Strip is isolated from the rest of Arizona by the Grand Canyon, making it among the most remote, rugged land in the lower 48 states. The catchments are managed by the AGFD, are intended as supplemental water sources for wildlife, and have been in use for 25 to 47 years. Wildlife species such as mule deer (*Odocoileus hemionus*) and Merriam's turkey (*Meleagris gallopavo merriami*), as well as other nongame species, benefit from the water supplied by these water catchments. Redevelopment and renovation of these catchments are intended to improve the reliability of water sources for wildlife use in the area.

These six catchments were constructed from 1965 to 1987. Original construction of the catchments specifically targeted mule deer in order to provide local herds with a reliable year-round water source. A reliable year-round water source is important because the Arizona Strip has limited rainfall and few permanent water sources for mule deer and other area wildlife. Permanent water sources are thought to expand wildlife distribution across the landscape, reduce mortality, and increase productivity (Roberts, 1977). Mule deer in particular are dependent on free-standing water during very dry periods; according to Remington et al. (1984) and Hervert and Krausman (1986), water developments in Arizona experience the most use by mule deer during hot summer months. According to habitat guidelines for mule deer, "water sources should not be more than 3 miles apart so all mule deer habitat is within 1.5 miles of a permanent water source" (Heffelfinger et al. 2006: 21).

After years of use, the six catchments addressed in this environmental assessment (EA) no longer function adequately for mule deer or other wildlife water needs. Routine inspections have revealed that the existing water catchments function poorly due to age-related deterioration, resulting in loss of water through leakage. Additionally, water in the catchments evaporates at a rate faster than can be replenished by rainfall, so water must be hauled to the catchments to maintain a water supply.

All catchments proposed for redevelopment are located on BLM-administered land within Grand Canyon-Parashant National Monument (GCPNM) (Figures 1.1 through 1.7). All six catchments are located in Mohave County, Gila and Salt River Baseline and Meridian (Table 1.1). Photographs of the existing catchments are located in Appendix A.

Table 1.1. Location of the Six Catchments

Catchment Name (Figure No.)	Catchment Number	U.S. Geological Survey 7.5-minute Quadrangle	GMU	Elevation (feet)	Township, Range, Section (T, R, S) (Gila and Salt River Baseline and Meridian)
Hells Hole (Figure 1.2)	9025	Mount Logan	13A	6,880	T35N, R9W, S10
Lion (Figure 1.3)	8051	Mount Logan	13A	6,720	T34N, R8W, S5
Ponderosa Burn (Figure 1.4)	9753	Mount Trumbull	13A	6,400	T35N, R8W, S32
Sawmill (Figure 1.5)	9026	Mount Logan	13A	7,280	T34N, R8W, S6
Turkey Track (Figure 1.6)	9029	Mount Logan	13A	7,120	T34N, R8W, S17
Snap Rim (Figure 1.7)	9590	Snap Draw	13B	6,280	T32N, R13W, S8

1.2 PURPOSE AND NEED

The purpose of this project is to redevelop the existing catchments, which would increase the storage capacity and reduce the visual profile of each catchment. Dependable operating catchments would reduce the number of water hauling trips to the catchments and would require less maintenance. This would allow continued provision of permanent water sources available for wildlife dependent on them.

The BLM needs improved wildlife water sources to maintain the availability of water for wildlife at these locations. As elaborated further in Sections 1.4.1 and 1.4.2, the BLM needs to manage wildlife forage, water, cover, and space in order to support productive and diverse wildlife populations. Also elaborated in Section 1.5, AGFD's strategic plan and development standards support the management and enhancement of wildlife habitats, including maintenance and/or redevelopment of existing water catchments, through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations. Thus, improving the availability of dependable water sources helps to assure that wildlife in the area thrive and remain self-sustaining by providing a necessary habitat component.

Figure 1.1. General location of the existing catchments.

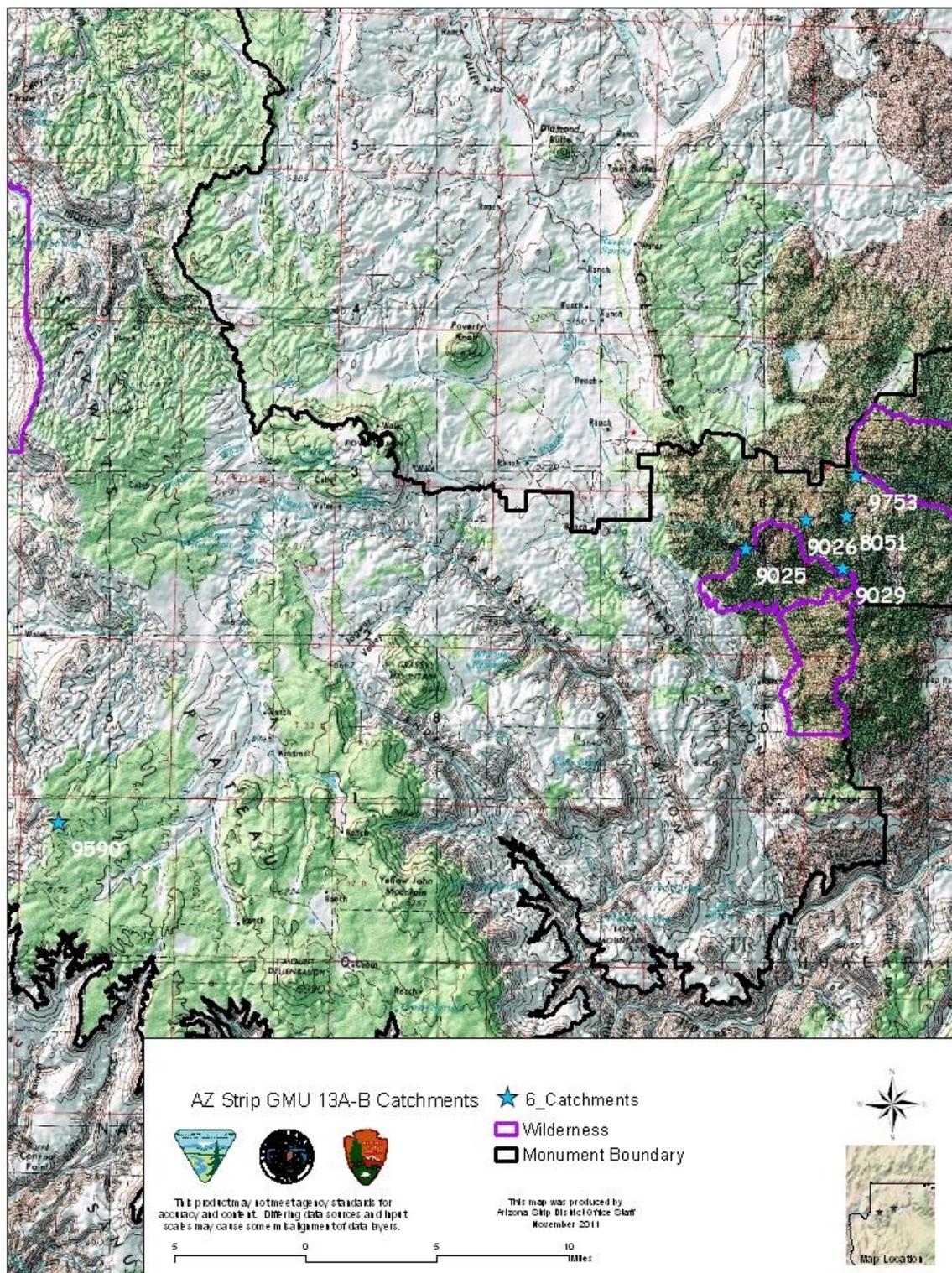


Figure 1.2. Catchment No. 9025.

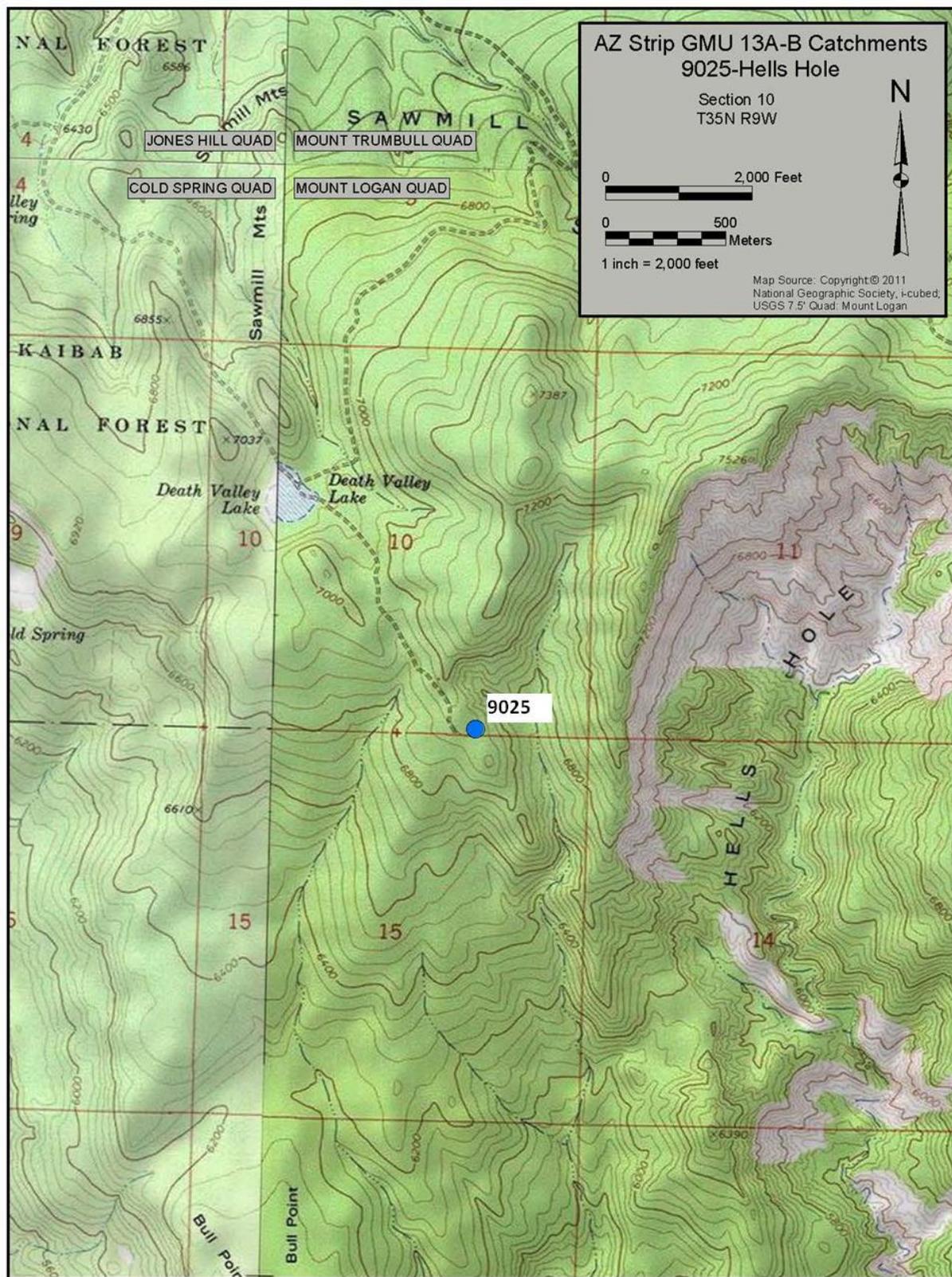


Figure 1.3. Catchment No. 8051.

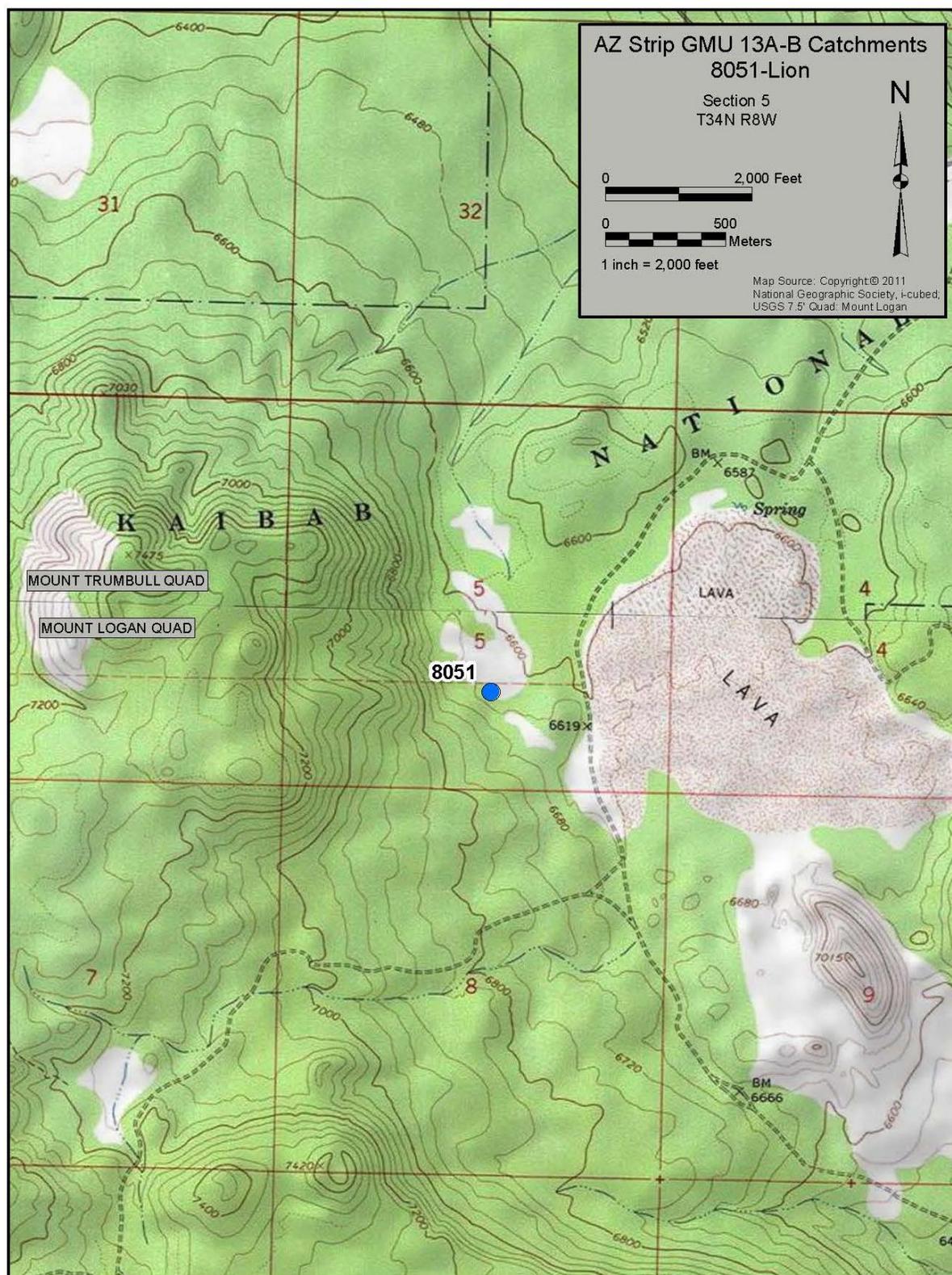


Figure 1.5. Catchment No. 9026.

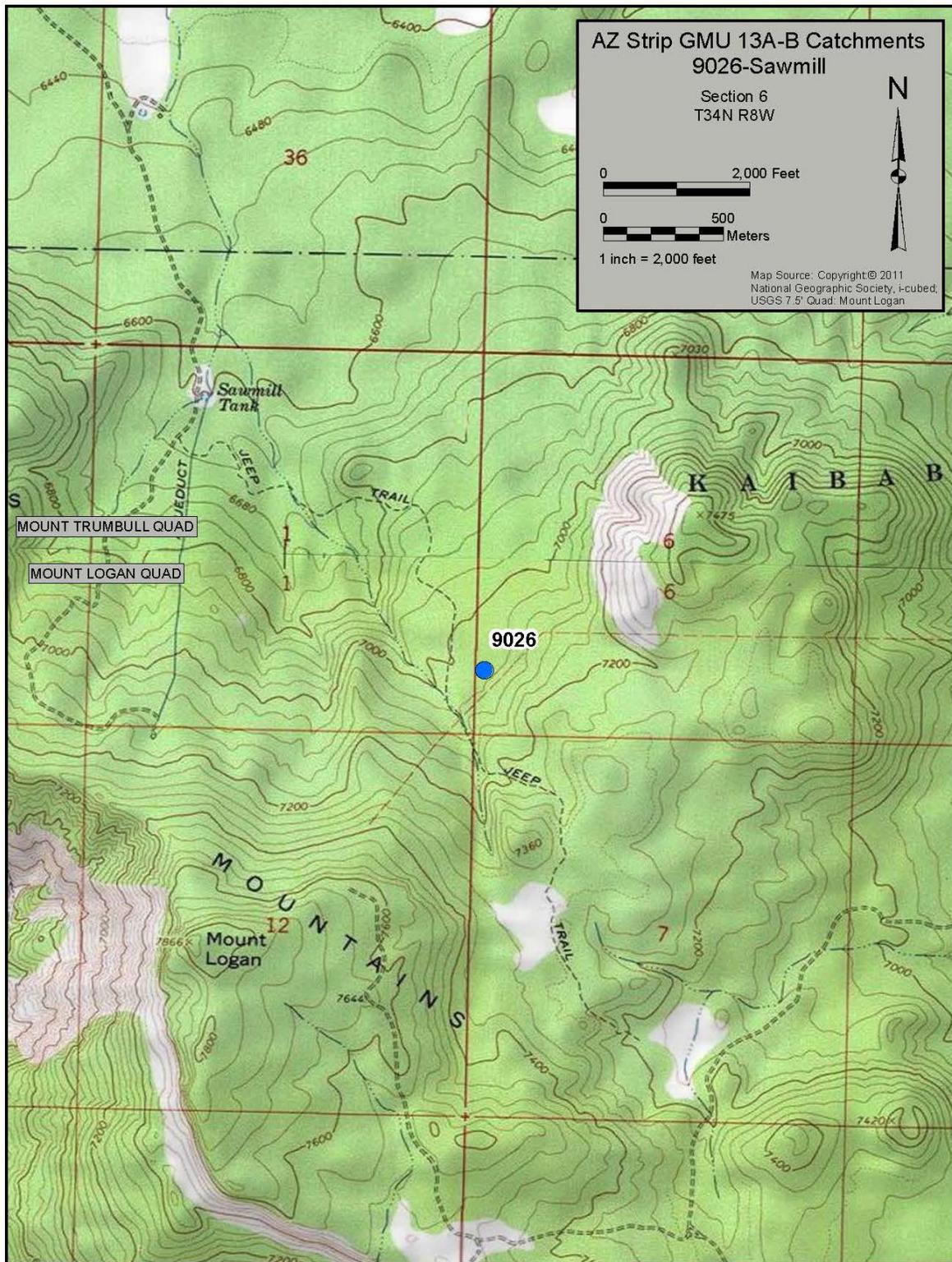


Figure 1.6. Catchment No. 9029.

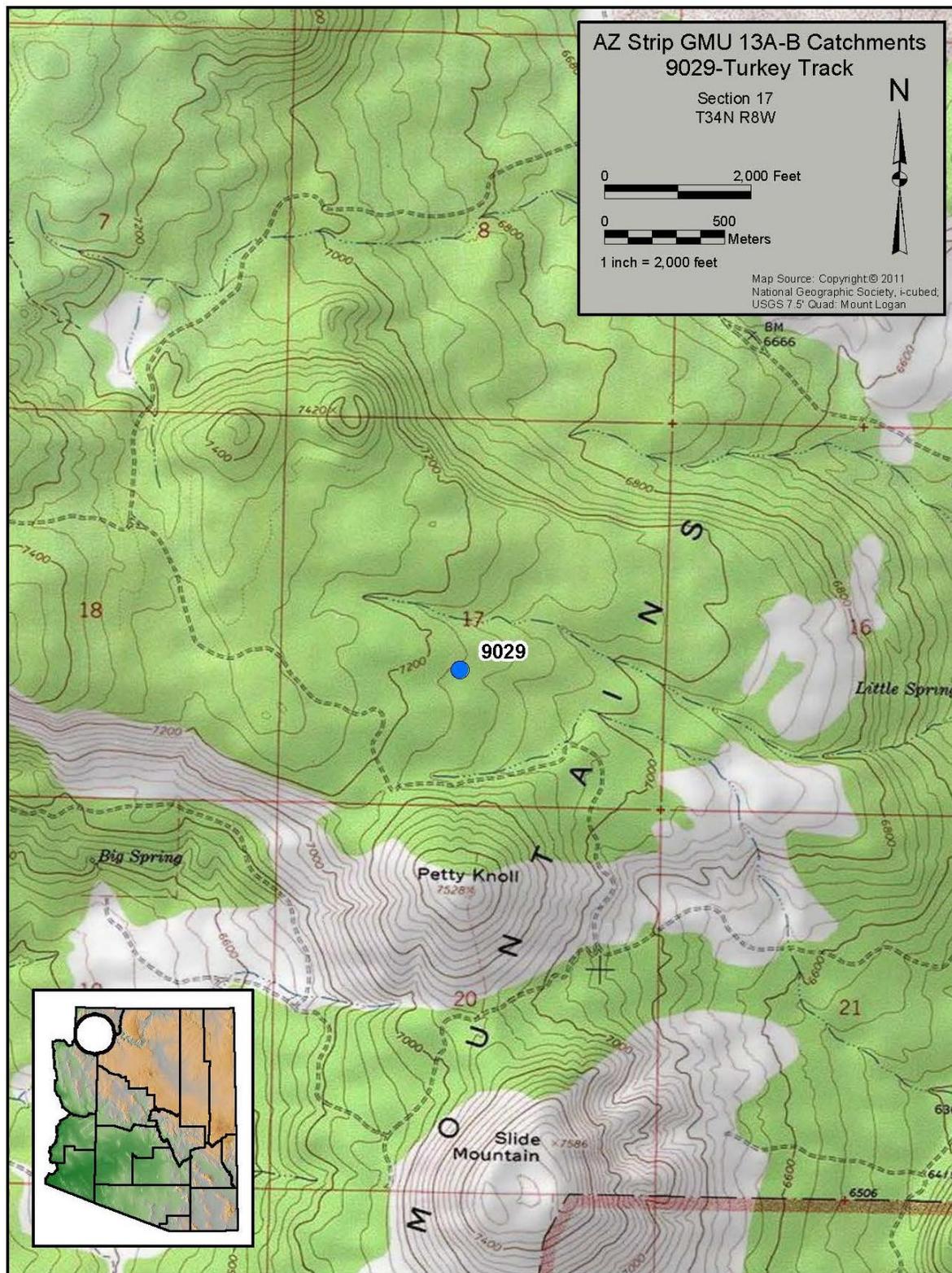
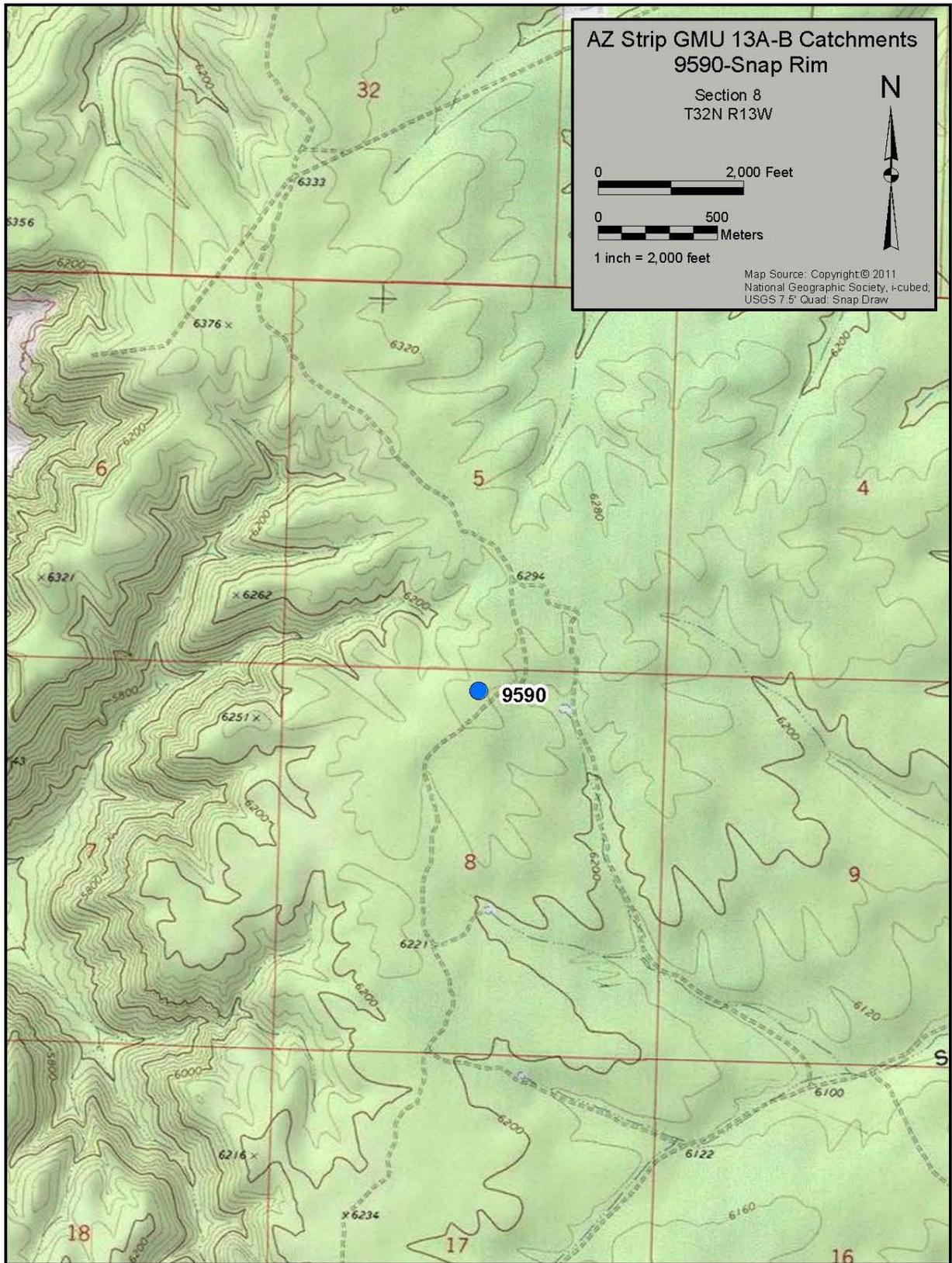


Figure 1.7. Catchment No. 9590.



1.3 GRAND CANYON-PARASHANT NATIONAL MONUMENT

All of the water catchments proposed for redevelopment are located within GCPNM. The Presidential Proclamation that established the Monument explains that GCPNM was created because of its “vast, biologically diverse, impressive landscape encompassing an array of scientific and historic objects.” The proclamation does not diminish the jurisdiction of the State of Arizona with respect to fish and wildlife management. The analysis of impacts to specific resources constitutes the analysis of impacts to Monument objects in this EA.

1.4 CONFORMANCE WITH LAND USE PLANS

The proposed action described in Chapter 2 is in conformance with the *Grand Canyon-Parashant National Monument Resource Management Plan* (RMP), approved on January 29, 2008 (BLM 2008a). The proposed action is consistent with the following decisions contained within this plan (see Section 1.4.1). It has also been determined that the proposed action would not conflict with other decisions throughout this plan.

1.4.1 Conformance with Grand Canyon-Parashant National Monument Resource Management Plan

The following decisions are from Table 2.3 in the RMP (BLM 2008a) regarding Vegetation and Fuels Management:

- **DFC-VM-03:** Native vegetative communities would be protected, including those considered Monument objects. A mosaic of native perennial and non-invasive annual vegetative communities would be present across the landscape with diversity of species, canopy, density, and age class reflecting its local ecological site potential and naturally occurring habitat conditions.
- **DFC-VM-05:** Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards for Rangeland Health and NPS Vital Signs and enhance Monument values.
- **DFC-VM-06:** Invasive plant species will be contained, controlled, or eliminated and native species restored to meet DPC objectives.
- **DFC-VM-07:** Each vegetation community is maintained within its natural range of variation in plant composition, structure, and function.
- **MA-VM-13:** Implementation of ongoing noxious weed and invasive species control actions will be continued as per national guidance and the Weed Management Area Plan. Integrated weed management will continue using available tools to control noxious weeds consistent with vegetation management decisions for each Ecological Zone and as appropriate to the land use allocation and in order to protect resources and Monument values.
- **DFC-VM-11:** There will be no net loss of total acres within the ponderosa pine plant communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.

- **MA-VM-17:** Stands of ponderosa pine will be managed for a balanced mosaic between tree, shrub, and perennial grass cover to support a healthy ecosystem while providing habitat for Merriam's turkey, Kaibab squirrel, and mule deer. The mosaics will include stands of old-growth ponderosa to support white-breasted nuthatch; a component of Gambel oak with grass and forb understory to provide foraging habitat for mule deer; large openings of grasses, forbs, and shrubs to provide foraging habitat for raptors such as sharp-shinned hawk, northern goshawk, Cooper's hawk, American kestrel, and red-tailed hawk; and areas of sparse to dense tree canopy cover with an understory of grasses, forbs, and shrubs to provide nesting habitat for Merriam's turkey, hiding cover for mule deer, and habitat for Kaibab squirrel. (See Wildlife and Fish decisions.)
- **DFC-VM-15:** There will be no net loss of total acres within sagebrush communities (i.e., long-term or permanent removal from the landscape). A no net loss objective will not preclude restoration, rehabilitation, or related management actions.
- **DFC-VM-28:** Stands of pinyon-juniper will include a balance between tree, shrub, and perennial grass cover to support pinyon jay and mule deer. This mosaic will include stands of old growth pinyon-juniper to support juniper titmouse; large openings of grasses, forbs and shrubs to support mule deer and provide foraging habitat for raptors such as sharp-shinned hawk, northern goshawk, Coopers hawk, American kestrel, and red-tailed hawk; and areas of sparse to dense tree canopy cover to support pinyon jay. (See Wildlife and Fish decisions.)

The following decisions are from Table 2.4 in the RMP (BLM 2008a) regarding Wildlife and Fish Management:

- **DFC-WF-01:** Ecological conditions will be within the range of natural variability and will be functional for dependent animal species.
- **DFC-WF-02:** Native wildlife communities, as Monument objects, will be protected. A complete range of diverse, healthy, and self-sustaining populations of native animal species will occupy all available suitable habitats.
- **DFC-WF-03:** Forage, water, cover, and space will be available to wildlife of sufficient quantity and quality to support productive and diverse wildlife populations.
- **DFC-WF-04:** All waters will be safely accessible to wildlife.
- **DFC-WF-05:** Fences will be the minimum necessary for effective livestock control or other administrative purposes. Fences will be wildlife passable, consistent with the species found in the area.
- **DFC-WF-10:** On BLM-administered lands, management of game and nongame species by AGFD will be consistent with AGFD Strategic Plans and other appropriate guidelines.
- **DFC-WF-12:** The natural biological diversity of fish, wildlife, and plant species will be maintained or, where necessary and feasible, restored throughout the Monument. Habitats will be managed on an ecosystem basis, ensuring that all parts of the ecosystem and natural processes are functional.
- **DFC-WF-13:** Mule deer habitat will provide the necessary forage, water, and shelter components for healthy, self-sustaining populations within the range of natural variability.
- **DFC-WF-19:** On BLM-administered lands, water sources within mule deer habitat will be spaced no more than 3 miles apart.
- **MA-WF-01:** Management emphasis and priority will be given to priority species and habitats in conflict resolution. Priority species include the following:

- All special status wildlife species known or suspected to occur in the area. Special status species include those that are Federally listed, proposed, or candidate species; species for which there is a signed conservation agreement or strategy; all species referenced in AGFD's Wildlife Species of Concern in Arizona document; and species included on the Arizona BLM and NPS sensitive list.
- All species of migratory birds known or suspected to occur within the Monument.
- All game mammals including: mule deer, pronghorn antelope, desert bighorn sheep, mountain lion, Kaibab squirrel, and desert cottontail rabbit.
- Game birds including Merriam's turkey, Gambel's quail, white-winged dove, mourning dove, band-tailed pigeon, chukar partridge, and waterfowl.
- The following carnivores: kit fox, gray fox, and long-tailed weasels.
- Priority habitats include the following:
 - All aquatic and/or riparian areas, including springs, seeps, and man-made waters. These areas are important for all wildlife species, particularly native fish, and migratory birds.
 - All portions of the ponderosa pine ecological zone. This habitat is important for Merriam's turkey and a variety of bats and migratory birds. It is also crucial summer range for mule deer.
 - All areas considered crucial mule deer winter range, including the Whitmore Canyon and Andrus Point.
 - All bighorn sheep habitat areas, including the Grand Wash Cliffs habitat area.
- **MA-WF-07:** On BLM-administered lands, construction of wildlife habitat improvement projects, including water developments and vegetation treatments, can be authorized to meet DFCs, assuming compliance with NEPA, the ESA, Monument proclamation, and other applicable laws, regulations, and policies. DPC objectives for wildlife will be incorporated into all habitat improvement projects including restoration and vegetation treatment projects. Specific projects will be listed in HMPs.
- **MA-WF-09:** Existing water developments will be modified to ensure wildlife have safe access to water. Existing water developments will be maintained to ensure reliability of the water. Maintenance of existing waters will generally take priority over new construction. Development of cooperative waters for livestock and wildlife will be encouraged where doing so will benefit wildlife, will be consistent with achieving DFCs, and will be economically efficient.
- **MA-WF-15:** On BLM-administered lands, self-sustaining mule deer populations will be enhanced or maintained in Game Management Units 13A and 13B. Initial or supplemental transplants can be authorized on a case-by-case basis. Existing habitat areas can be expanded and new habitat areas may be added where consistent with protection of Monument objects and management unit objectives.
- **MA-WF-17:** On BLM-administered lands, mule deer will be managed for healthy, self-sustaining populations in accordance with population goals and objectives established in the AGFD Strategic Plan for the species.

The following decision is from Table 2.7 in the RMP (BLM 2008a) regarding Cultural Resource Management:

- **DFC-CL-02:** Imminent threats and potential conflicts from natural or human-caused deterioration or potential conflict with other resource uses will be reduced (Federal Land Policy and Management Act [FLPMA] Sec. 103, National Historic Preservation Act (NHPA), Sections 106 and 110 (a) (2)) by ensuring that all land uses and resource uses initiated or authorized by the

BLM comply with Section 106 of the NHPA in accordance with the BLM's National Cultural Resources Programmatic Agreement and Arizona Protocol

The following decisions are from Table 2.8 in the RMP (BLM 2008a) regarding Visual Resources:

- **DFC-VR-01:** Public lands will be managed in a manner which will protect the quality of the scenic (visual) values of these lands (43 U.S. Code [USC] 1701, Section 102 (a) (8)).
- **DFC-VR-03:** The region's scenic beauty, open space landscapes, and other high-quality visual resources, including Monument objects, will be maintained within the Monument.
- **DFC-VR-06:** There are four visual resource management (VRM) classes. The objectives for each class, which provide visual management standards for the design and development of future projects and for rehabilitation of existing projects in the Monument are as follows.
 - Class 1* - The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change of the characteristic landscape should be very low and must not attract attention.
 - Class 2* - The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
 - Class 3* - The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
 - Class 4* - The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.
- **MA-VR-03:** All new surface disturbing projects or activities, regardless of size or potential impact, will incorporate visual design considerations during project design as a reasonable attempt to meet the VRM class objectives for the area and minimize the visual impacts of the proposal. Visual design considerations will be incorporated by:
 - Using the VRM contrast rating process (required for proposed projects in highly sensitive areas, high impact projects, or for other projects where it appears to be the most effective design or assessment tool), or by
 - Providing a brief narrative visual assessment for all other projects that require an environmental assessment (EA) or environmental impact statement (EIS).
 - Measures to mitigate potential visual impacts include the use of natural materials, screening, painting, project design, location, or restoration (See Appendix I; BLM Handbook H-8431-1, Visual Resource Contrast Rating; or online at <http://www.blm.gov/nstc/VRM/8431.html>, for information about the contrast rating process).

The following decisions are from Table 2.10 in the RMP (BLM 2008a) regarding Wilderness Characteristics:

- **DFC-WC-01:** The following wilderness characteristics will be maintained on both BLM and NPS-administered lands:
 - High Degree of Naturalness: Lands and resources affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable.
 - Outstanding Opportunities for Solitude: When the sights, sounds, and evidence of other people are rare or infrequent (and) where visitors can be isolated, alone or secluded from others.
 - Outstanding Opportunities for Primitive and Unconfined Recreation: Where the use of the area will be through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered.
- **DFC-WC-03:** Wildlife populations and habitat are important aspects of the ecosystem and are an important component of naturalness.
- **DFC-WC-04:** Wildlife management activities will be consistent with naturalness in areas having wilderness characteristics
- **MA-WC-03:** Restoration, vegetation treatments, wildlife management projects on BLM-administered lands, and other surface disturbing actions can be authorized in areas managed to maintain wilderness characteristics to achieve DFCs.
- **MA-WC-04:** New projects or maintenance of existing projects that enhance wildlife habitat or other resources can be allowed, provided they can be designed to be substantially unnoticeable over time.

The following decisions are from Table 2.14 in the RMP (2008a) regarding Recreation Management:

- **DFC-RR-01:** Recreation and visitor services will be managed to provide varying levels of structured recreation opportunities that offer a range of specific benefits, activities, and experiences within outdoor settings (Special Recreation Management Areas [SRMAs]; See Map 11).
- **DFC-RR-04:** Existing opportunities for visitors to enjoy sightseeing and viewing wildlife in the Backways TMAs will be maintained/enhanced.
- **DFC-RR-05:** The excellent opportunities that exist to enjoy remote, rustic settings that provide moderate challenge and solitude in the Specialized TMAs will be maintained/enhanced.
- **DFC-RR-06:** In Backways and Specialized TMAs, recreation opportunities associated with somewhat remote settings, such as exploring backcountry roads, vehicle camping, hunting, sightseeing, recreation aviation, and picnicking will be maintained/enhanced on existing roads, provided they will be compatible with the protection and enhancement of sensitive resource values and Monument objects, where appropriate.
- **DFC-RR-07:** In the Primitive TMA, high quality recreation opportunities associated more with primitive recreation experience opportunities and non-motorized uses such as camping, sightseeing, hiking, horseback riding, and hunting, will be maintained/enhanced, provided they will be compatible with the protection and enhancement of sensitive resource values and Monument objects, where appropriate.
- **MA-RR-01:** To the extent practicable, the natural or “remote” settings in Specialized and Primitive TMAs will be restored and/or maintained using a combination of projects and natural processes as the need or opportunity arises.

1.4.2 Consistency with the Revised Mt. Trumbull HMP

The following objective is from Goal C of the revised Mt. Trumbull Habitat Management Plan (1992) regarding Riparian Habitat and Wildlife Water Related Management:

- **C(1):** Existing natural water sources and wildlife water developments will be managed and maintained so that water which is needed by wildlife is available and provided in a reliable manner on a continuing basis.

The proposed action is consistent with this HMP objective.

1.5 RELATIONSHIP TO STATUTES, REGULATIONS, OR OTHER PLANS

This EA has been prepared in accordance with the requirements of NEPA and any additional federal or state statutes and local ordinances that may be relevant to the proposed action, such as those cited below.

The proposed action is consistent with the Fundamentals of Rangeland Health (43 Code of Federal Regulations [CFR] 4180.1) and Arizona's Standards and Guidelines, which were developed through a collaborative process involving the Arizona Resource Advisory Council and the BLM State Standards and Guidelines Team. The Secretary of the Interior approved the Standards and Guidelines in April 1997. These standards and guidelines address watersheds, ecological condition, water quality, and habitat for sensitive species. These resources are addressed later in this document.

The proposed action conforms to the President's National Energy Policy and would not have adverse energy impacts. The proposed action would not deny energy projects, withdraw lands, close roads, or in any other way deny or limit access to mineral materials to support energy actions.

Executive Order 13186 requires the BLM and other Federal agencies to work with the U.S. Fish and Wildlife Service to provide protection for migratory birds. Implementation of the proposed action is not likely to adversely affect any species of migratory bird known or suspected to occur in the project area. No take of any such species is anticipated.

The project areas are located in Mohave County, Arizona. The proposed action is consistent with the *Mohave County General Plan* (adopted September 1994). While water catchments are not specifically addressed in the *Mohave County General Plan*, this action does not conflict with decisions contained within the plan.

The proposed action complies with the *Arizona Game and Fish Department's Wildlife Program Management Strategic Plan for the Years 2007–2012* (AGFD 2007); and the *Arizona Game and Fish Department Water Development Standards* (AGFD 2005). AGFD's strategic plan and development standards support the management and enhancement of wildlife habitats, including maintenance and/or redevelopment of existing water catchments, through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

In addition, the proposed action would comply with the following laws and/or agency regulations and are consistent with applicable Federal, State, and local laws, regulations, and plans to the maximum extent possible.

- Federal Land Policy and Management Act of 1976 (43 United States Code [USC] 1707 et seq.)
- Endangered Species Act of 1973, as amended

- Section 106 of the National Historic Preservation Act of 1966, as amended
- Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001–3013; 104 Stat. 3048-3058)
- National Environmental Policy Act of 1969
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

1.6 IDENTIFICATION OF ISSUES

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of one of the alternatives. A summary of the issues and the rationale for analysis are given below.

- **Vegetation:** Disturbance to vegetation would occur during construction, including the loss of shrubs, grasses, and forbs in and around the footprint of the catchments. Maintenance and water hauling could also result in minor trampling of vegetation within and adjacent to the catchment sites.
- **Wildlife:** Disturbance to wildlife, including migratory birds and sensitive species, could occur during construction, water hauling, and maintenance activities, including the loss of vegetation and, consequently, the potential short-term loss of wildlife habitat, as well as increased short-term noise and soil compaction. Wildlife such as mule deer, turkey, and certain nongame species would be affected in the long-term by the presence of more reliable water sources.
- **Recreation:** Disturbance to the recreating public could occur during construction activities. Disturbances could include increased noise as well as reduced opportunities for solitude in the short term. In the long-term, improvements to the catchment design should reduce the number of water hauling and maintenance trips and attract wildlife to the catchments, resulting in increased opportunities for solitude in the area and increased opportunities for wildlife viewing.
- **Visual Resources:** The proposed action has the potential to alter the appearance of the project area (i.e., the visual setting). Design features included in the Proposed Action would reduce the visual contrast of the catchment structures.
- **Cultural Resources:** A substantial cultural resource is recorded at Catchment No. 9590 that could potentially be impacted by construction activities at that catchment site.

Chapter 2

PROPOSED ACTION AND ALTERNATIVES

This EA focuses on the proposed action and no action alternatives. The no action alternative is considered and analyzed to provide a baseline for comparing the impacts of the proposed action. The BLM interdisciplinary team explored and evaluated several different alternatives to determine whether the underlying need for the proposed action, to provide a reliable year-round water source for wildlife, would be met. Those alternatives considered but eliminated from further analysis are described in Section 2.3, along with the rationale for not further considering these alternatives.

2.1 PROPOSED ACTION

The existing water catchments would be replaced to ensure adequate future water supply in each area. The proposed improvements include complete removal of the existing catchments. Construction of the catchments includes installing aprons, troughs, pipelines, fence, and an underground fiberglass storage tank in a manner consistent with the *AGFD Wildlife Water Development Standards* (AGFD 2005). All ground disturbance would remain within the existing fenced areas.

Access to the catchments would occur on open designated routes. No road improvements are proposed or expected to be necessary at any of the six catchments; however, if erosion or road deterioration occurs over time, BLM standard best management practices (BMPs), as described in Section 2.1.1, would be implemented. Pinyon pine and juniper limbs would need to be trimmed along the access road to Catchment No. 9590 in order to allow truck and backhoe access to the catchment location. Tree limb removal would occur only where necessary and would be limited to the minimum amount necessary to allow for the passage and movement of vehicles and equipment. Minor limbing may also be necessary at other catchment sites. Catchment No. 9025 is accessed by Route No. 1016 (P6003); Catchment No. 8051 is on Route No. 1802 (P6043); Catchment No. 9753 is on Route No. 1775 (P6042); Catchment No. 9026 is on Route No. 1768 (P6004); Catchment No. 9029 is on Route No. 1044G (P6007B); and Catchment No. 9590 is on Route No. 1666 (P3010).

Redevelopment of each water catchment would involve the installation of three separate components, all of which have a lower visual profile than the existing catchments. These components are 1) a 3-foot-deep fiberglass walk-in trough for each catchment; 2) a 3-foot-deep \times 18-foot-diameter fiberglass storage tank; and 3) a 24-foot-wide \times 72-foot-long metal apron with steel studs and R-panel. An "R-panel" is heavy-gauge corrugated tin with a baked-on color finish. The existing barbed-wire fencing would be removed and replaced to AGFD standards. These standards include constructing a welded, wildlife-friendly, pipe-rail enclosure fence on the existing fence line. See Appendix B for schematic drawings of the proposed catchments.

The proposed improvements would result in the short-term surface disturbance of up to 1.0 acre at each catchment location resulting from construction and installation of the catchment, as well as equipment and materials being spread out/stored on-site during the construction – the exact area of disturbance would vary at each catchment based upon vegetation and topography. Ground disturbance and redevelopment activities at each catchment would include the backhoe excavation of a 5-foot-deep \times 20-foot-wide \times 45-foot-long trench to install the storage tank. If large boulders, bedrock, or other conditions prevent digging the hole to the desired depth, the tank would either be partially buried or placed aboveground. A new 24-foot-wide \times 72-foot-long metal precipitation collection apron would be installed

over the tank hole; the apron would have a fiberglass gutter that would feed directly into the tank. A 3-foot-deep \times 4-foot-wide hole would be excavated to install the fiberglass walk-in trough; again, if large boulders, bedrock, or other conditions occur, the trough would either be partially buried or placed above ground. A trench measuring approximately 3–5 feet deep \times 20–40 feet long would be excavated prior to the installation of a pipeline leading from the tank to the trough. Any soil and rock removed from excavation of the tank would be spread within the fenced area, and all disturbed areas would be leveled and smoothed to match the surrounding topography. After construction is completed, the area of long-term disturbance at each catchment site (the apron area, trough area, and access area that allows for routine maintenance) would be approximately 0.1 acre.

Installed catchment components would be kept as inconspicuous as possible using various camouflage techniques, to the greatest extent possible, to minimize any potential impacts. Techniques could include painting components with earth tones, using no reflective materials, breaking up linear shapes with sculpted concrete, covering components with soil, rock, or dead limbs, or burying components underground. The walk-in water trough, tank, and connecting pipelines would be partially or wholly buried underground. However, if soil conditions impede excavation to the desired depth (up to approximately 5 feet), camouflage techniques would be limited to the use of rocks and dead vegetation native to the catchment location to blend the structure into the surrounding landscape.

Crew work time at each catchment is estimated to be up to two weeks. Once construction at each catchment is complete, all extraneous construction materials would be removed from the area and disposed of properly. Disturbed surfaces would be leveled and smoothed to match the surrounding topography. Disturbance to live vegetation would be kept to a minimum by restricting construction activities to the existing catchment footprints and immediate areas.

Sagebrush and other shrubs would be cleared within a 75 ft. radius of the drinker to reduce predator ambush points and allow increased visibility for wildlife around drinkers. Larger trees would be left standing but lower limbs trimmed to create a view path for wildlife. Brush removal would also create less of a long term maintenance concern around the apron. Vegetation along the fence perimeter would also be cleared to a width of approximately 3 feet on either side of the fence to allow for fence construction and reduced long-term maintenance.

During construction, a campsite may be needed for work crews at each catchment site. The locations of any campsite for construction crews would be coordinated with BLM and located in previously disturbed areas. Workers would camp and park, during nonworking hours, at least $\frac{1}{4}$ mile away from each construction area, for the entire work period.

The minimum number of tools necessary to complete the project would be transported to the site via trucks and trailers. Using only existing roads, trucks would transport materials and a backhoe tractor to each project site. The trucks would transport small hand tools and miscellaneous hardware. The backhoe would excavate a hole for the tanks, trough, and pipeline at the site and would help position these components in place. The backhoe would only be used inside the enclosure fence.

After construction is complete, two activities would occur at each catchment location: site restoration and maintenance, including limited water hauling. First, excavated dirt would be recontoured throughout the project area by the construction crew. Dead and downed plant material, in addition to existing rock debris, would be placed on top of the disturbed area to camouflage the catchment area and facilitate revegetation. The construction crew would lightly rake out human footprints and tire tracks from the backhoe and trucks. Any topsoil would be replaced, and a BLM-approved seed mix would be applied to the area to aid in revegetation.

Second, water would be hauled to each catchment to sufficiently fill the tanks until naturally occurring rainfall replaces the initial delivery. Additional water would be hauled to each catchment as needed; the amount would depend on local precipitation levels. The proposed catchment design is expected to require fewer water hauling trips than the existing catchments because the redeveloped catchments could hold up to 10,000 gallons of water, while the existing catchments can only store up to 2,500 gallons of water.

Long-term maintenance activities at the catchments would include conducting inspections seven to eight times per year to ensure adequate water levels, removal of debris from intake areas, assessment and repair of damage to each catchment, and performance of other minor maintenance activities. The frequency of maintenance activities would depend on weather conditions, volume of animal use, and unexpected damage to the catchments. The redeveloped catchments are expected to require less maintenance than the existing catchments. For example, most components of the proposed catchments are expected to be located beneath the surface, which reduces impacts from weather deterioration.

The proposed action does not currently include plans for installation of a precipitation/water-level gauge; however, long-term maintenance at the catchments could include installation of such a device.

Components associated with the gauge include a 10-foot-tall × 12-inch-wide tube anchored in concrete, which houses the battery, associated electronics, and a solar panel. Depending on the location and reception in the area, a 6- to 10-foot-long antenna would be mounted atop the tube to send and receive data. A ¾-inch conduit would be run from the housing tube to the gauge in the catchment, which is housed in a 2-inch galvanized pipe. These gauges could be installed at the catchments to collect raw data on precipitation levels, as well as to monitor the level of the water in the catchment. An email alert is transmitted to AGFD when water in the catchment reaches below 0.5 foot. This alert system could enable AGFD to haul supplemental water to catchments as needed, much more efficiently than the current manual inspection system. Installation of a precipitation/water-level gauge would reduce vehicular traffic and reduce impacts from human presence, both at the catchments and along the access routes. Installed catchment gauge components would be kept as inconspicuous as possible using various camouflage techniques, to minimize any potential visual impacts. Gauge components would be painted with earth tones, and no reflective materials would be used.

2.1.1 Best Management Practices

The following BMPs are included in the proposed action in an effort to minimize the impacts of the proposed action to social and natural environmental resources. The following are practices that would be implemented at all catchments:

- Construction activities would be limited to daylight hours to minimize impacts to wildlife.
- Construction activities would be limited to periods when the soil and ground surface are not wet in order to avoid soil compaction issues.
- Construction activities would be conducted in a manner that would minimize disturbance to existing vegetation by limiting vegetation thinning and restricting construction activities to the existing catchment footprints, within the existing fenced areas.
- If an active bird nest is observed before or during construction, measures would be taken to protect the nest.
- The locations of any campsites for construction crews would be coordinated with the BLM and located in previously disturbed areas.
- Vehicles and equipment would be power washed off-site before construction activities at each catchment site to minimize the risk of spreading weeds; this would include cleaning all equipment before entering the Arizona Strip, as well as cleaning it between work sites. The project areas

would be monitored for weeds after construction until they are recovered/revegetated, or for 2 years, whichever comes sooner.

- Soil disturbance associated with construction activities would be limited by restricting disturbance to the existing catchment footprints and immediate vicinity.
- Excavated soil would be recontoured throughout the project area (includes scraping and piling).
- Any topsoil would be replaced and a BLM-approved seed mix would be applied to aid in revegetation.
- The following actions would be implemented to minimize visual impacts associated with the redevelopment activities: 1) natural material, such as dead vegetation and rock debris, would be returned to the disturbed area; 2) above ground components would be painted colors that blend in with the surrounding landscape (i.e., medium grays or earthen colors); 3) pigment would be added to cement used in the berm and trough so that they blend in with the surroundings; 4) rocks from the area would be used to avoid or mask straight lines (i.e., placed atop berms); and 5) if installed, precipitation/water-level gauge components would be kept as inconspicuous as possible employing various camouflage techniques, such as using native materials and/or paint colors that blend in with the surrounding landscape and no reflective materials.
- If amphibians (any life stage) are present at the time of reconstruction, they would be transferred to buckets using the water from the wildlife catchment and returned when construction is complete.
- During construction, vehicular traffic would be restricted to designated routes.
- Construction trenches would be designed with 45° to 60° slopes to meet Occupational Health and Safety Administration standards for trenching and to prevent wildlife from becoming entrapped. Trenches would be checked each day for entrapped animals before commencing work activities.
- Construction debris would be removed to an appropriate landfill location.
- All construction activities at the Snap Rim catchment (#9590) would be monitored by an archaeologist.
- Any cultural (historic/prehistoric site or object) or paleontological resource (fossil remains of plants or animals) discovered at the catchment sites would immediately be reported to the authorized officer or his/her designee. All operations in the immediate area of the discovery shall be suspended until written authorization to proceed is issued. An evaluation of the discovery shall be made by a qualified archaeologist or paleontologist to determine appropriate actions to prevent the loss of significant cultural or scientifically important paleontological values.
- If in connection with this work any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, operations in the immediate area of the discovery would stop, the remains and objects would be protected, and the GCPNM Manager would be immediately notified. The immediate area of the discovery would be protected until notified by the GCPNM Manager that operations may resume.
- Construction of the improvements is not anticipated to affect waters of the United States; however, the AGFD would obtain appropriate permits when necessary before project implementation.
- Those involved with catchment redevelopment and/or maintenance activities would notify the BLM wildlife team lead if California condors visit the worksite while permitted activities are underway. Project activities would be modified or delayed where adverse effects to condors may result.

- The project site would be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. BLM staff may conduct site visits to the area to ensure adequate clean-up measures are taken.

2.1.2 Monitoring

Monitoring under the proposed action would consist of inspections of the water catchments by the AGFD and BLM during redevelopment to ensure compliance with the best management practices listed in Section 2.1.1. Periodic inspections would subsequently be conducted by BLM specialists as determined necessary. Monitoring may also be conducted by the grazing permittee in cooperation with BLM specialists. The project areas would be monitored for weeds after construction until they are recovered/revegetated, or for 2 years, whichever comes sooner.

2.2 NO ACTION ALTERNATIVE

Under the no action alternative, none of the water catchments would be replaced, and no new construction, renovation, or upgrading would occur. Water would continue to be hauled to the sites at a rate that would be expected to increase as the condition of the existing catchments deteriorates. The expected frequency of future water hauling trips could increase up to double the water delivery of current conditions; water delivery could increase from one to two trips per year up to two to four trips per year. Eventually the existing catchments would deteriorate to the point of failure and would no longer provide reliable water to those wildlife species that have come to rely on these sources.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

2.3.1 Refrain from Replacing the Water Catchments and Discontinue Hauling Water

Under this alternative, AGFD would not redevelop the water catchments and would discontinue hauling water to the existing catchments. These water sources would no longer provide a reliable, year-round water supply, and wildlife in the area would rely solely on naturally occurring seasonal water sources.

Mule deer, turkey, and several nongame species have come to depend on water sources such as the six catchments analyzed in this EA. Not replacing these catchments and not continuing to haul water to fill them would likely result in a reduced deer population density in the Project Area (Brownlee 1979). This alternative does not meet the purpose and need of the project as described in Section 1.2. In addition, this alternative would not be in conformance with GCPNM RMP decision DFC-WF-03 listed in Sections 1.4.1 and 1.4.2 of this document and objective C(1) of the revised Mt. Trumbull HMP listed in Section 1.4.3 of this document. Therefore, it was not carried forward for further analysis. .

2.3.2 Relocation of Catchments outside of GCPNM

Under this alternative, the six catchments would be relocated to new locations outside of GCPNM. Once the new catchments were constructed, and wildlife use of each new catchment was verified (i.e. for 6 –12

months), the existing catchments would be removed. All aboveground structures at the existing catchment sites would be reclaimed and reseeded.

As discussed in Section 2.3.2 and described in the “Purpose and Need” (Section 1.2), any new location for the catchments would need to be no more than 3 miles from another existing catchment (or other reliable wildlife water) to satisfy mule deer currently dependent on these water sources. According to habitat guidelines for mule deer, “water sources should not be more than 3 miles apart so all mule deer habitat is within 1.5 miles of a permanent water source” (Heffelfinger et al. 2006: 21). The existing catchments serve the fringe areas of surrounding water sources and provide additional reliable water sources for mule deer and other wildlife species. In order to maintain a water source within 3 miles of existing waters, these six catchments would need to remain at or near their current location.

Relocation of the catchments would require new disturbance and construction of new features. The existing catchments are located within areas that have already been disturbed, so impacts to GCPNM resources would be lower if the catchments were redeveloped rather than relocated. In addition, relocating them outside GCPNM would not meet the spacing requirement identified in the GCPNM RMP of “water sources within mule deer habitat will be spaced no more than 3 miles apart.” Relocation would also not meet the purpose and need (of providing reliable wildlife water sources no more than 3 miles apart) identified for this action. For these reasons, this alternative was not carried forward for detailed analysis.

Chapter 3

AFFECTED ENVIRONMENT

The purpose of this chapter is to describe the existing environment potentially affected by the alternatives. Up to 1 acre of short-term disturbance could be associated with the construction of each water catchment system. Following completion of the project and restoration activities, approximately 0.1 acre would remain disturbed in the long term.

Five of the six catchment sites are located along the Uinkaret Plateau in the vicinity of Mt. Trumbull and Mt. Logan. The Snap Rim catchment (#9590) is located on the Shivwits Plateau. The catchment sites are characterized by mountainous terrain, with rolling hills and mature forests transitioning to wide-open desert scrub.

The six catchments were originally constructed from 1965 to 1987 as water sources that primarily targeted mule deer, Merriam's turkey, and other small or non-game wildlife species. The original construction at each catchment consisted of a 200 × 225-foot barbed-wire fence, a 20 × 60-foot corrugated sheet-metal apron, a concrete vault at the end of the apron, and a concrete drinker. The metal aprons are secured to the ground at intervals using concrete anchors rather than wood studs and are encompassed by a second 40 × 80-foot barbed-wire, enclosure fence.

Hells Hole Catchment. The Hells Hole catchment is located in the Sawmill Mountains, approximately 1.7 miles west of Mount Logan and 0.75 mile southeast of Death Valley Lake (Figure 1.2). The catchment is situated in a pinyon-juniper woodland at an elevation of 6,880 feet. Vegetation includes singleleaf pinyon pine (*Pinus monophylla*), juniper (*Juniperus* sp.), oak (*Quercus* sp.), pointleaf manzanita (*Arctostaphylos pungens*), cliffrose (*Cowania* sp.), serviceberry (*Amelanchier* sp.), and spreading phlox (*Phlox diffusa*). The existing catchment consists of a corrugated metal-covered structure with a small trough on the corner of the structure.

Lion Catchment. The Lion catchment is located approximately 1.75 miles northeast of Mount Logan and approximately 2 miles southwest of Mount Trumbull (Figure 1.3). The catchment is situated in an open ponderosa pine forest on the edge of a stand of sagebrush at an elevation of 6,720 feet. Vegetation includes ponderosa pine (*Pinus ponderosa*), big sagebrush (*Artemisia tridentata*), New Mexico locust (*Robinia neomexicana*), and Gambel oak (*Quercus gambelii*). Invasive species present include common mullein (*Verbascum thapsus*). The existing catchment consists of an open, lined apron with an underground pipe connected to a small trough placed a short distance away.

Ponderosa Burn Catchment. The Ponderosa Burn catchment is located approximately 0.5 mile west of the Nixon Ranger Station and just southwest of the base of Mount Trumbull (Figure 1.4). The catchment is situated in an open ponderosa pine forest with a grassy understory located above a small drainage at an elevation of 6,400 feet. Vegetation includes ponderosa pine, big sagebrush, and various grasses including cheatgrass and pine dropseed. The existing catchment consists of an open, lined apron and a small trough nearby.

Sawmill Catchment. The Sawmill catchment is located in the Sawmill Mountains, approximately 1 mile northeast of Mount Logan (Figure 1.5). The catchment is situated in a moderately dense ponderosa pine forest at an elevation of 7,280 feet. Vegetation includes ponderosa pine, singleleaf pinyon pine, juniper, big sagebrush, serviceberry, cheatgrass (*Bromus tectorum*), and trumpet gooseberry (*Ribes leptanthum*). The existing catchment consists of a corrugated metal-covered structure with a small trough on the corner of the structure.

Turkey Track Catchment. The Turkey Track catchment is located approximately 2.25 miles southeast of Mount Logan and approximately 0.5 mile north of Petty Knoll (Figure 1.6). The catchment is situated in a moderately dense ponderosa pine forest at an elevation of 7,120 feet. Vegetation includes ponderosa pine and various grasses including brome (*Bromus* sp.) and pine dropseed (*Blepharoneuron tricholepis*). The existing catchment consists of an open, lined apron with an underground pipe connecting to a cylindrical storage tank. From the cylindrical tank, an aboveground pipe connects to a larger storage tank a short distance away. There is also a small trough connected to the cylindrical storage tank by an underground pipe. In addition, there is another aboveground cylindrical tank connected to a small trough by an underground pipe located west of the apron. One of these cylindrical tanks is a temporary tank installed 3–4 years ago; the temporary tank was installed because the original catchment tank failed.

Snap Rim Catchment. The Snap Rim catchment is located approximately 1.5 miles east of the Upper Grand Wash Cliffs and 1.25 miles northwest of Snap Draw (Figure 1.7). The catchment is situated in a pinyon-juniper woodland at an elevation of 6,280 feet. Vegetation includes juniper, singleleaf pinyon pine, pointleaf manzanita, oak, cholla (*Cylindropuntia* sp.), big sagebrush, yucca (*Yucca* sp.), and cliffrose. The existing catchment consists of a corrugated metal-covered structure with a small trough on the corner of the structure.

3.1 ELEMENTS/RESOURCES OF THE HUMAN ENVIRONMENT

The BLM is required to consider many authorities when evaluating a Federal action. Those elements of the human environment that are subject to the requirements specified in statute, regulation, or executive order, and must be considered in all EAs (BLM 2008b), have been considered by BLM resource specialists to determine whether they would be potentially affected by the proposed action. These elements are identified in Table 3.1, along with the rationale for determination on potential effects. If any element was determined to be potentially impacted, it was carried forward for detailed analysis in this EA; if an element is not present or would not be affected, it was not carried forward for analysis. Table 3.1 also contains other resources/concerns that have been considered in this EA. As with the elements of the human environment, if these resources were determined to be potentially affected, they were carried forward for detailed analysis in this document. The analysis of these resources also constitutes an analysis of Monument objects.

Table 3.1. Summary Evaluation of Elements/Resources of the Human Environment

Resource	Determination*	Rationale for Determination
* NP = Not present in the area that will be impacted by the proposed action. NI = Present, but not affected to a degree that would mean detailed analysis is required. PI = Present with potential for impact; analyzed in detail in the EA.		
Air Quality	NI	Air quality in the general area is good, although windblown dust can be a minor source of pollution. The six catchments are within an attainment area for all National Ambient Air Quality Standards. The proposed action would result in temporary, localized deterioration of air quality because of the operation of equipment and the dust generated from renovation and construction activities at each catchment, but these emissions would be temporary and would cease once renovation at each catchment site is complete.
Areas of Critical Environmental Concern	NP	None of the catchments addressed in this EA are located within an Area of Critical Environmental Concern.

Resource	Determination*	Rationale for Determination
Cultural Resources	PI	<p>Cultural resource inventories were conducted in 2011 for the six catchment locations (SWCA 2011b). The footprint of each existing catchment is less than 1 acre; however, 4–6 acres at each catchment was surveyed.</p> <p>One National Register of Historic Places (NRHP)-eligible site, AZ A:14:284(ASM), was recorded at Catchment No. 9590. The proposed action could lead to a loss of some information potential of the site which may change its NRHP eligibility. Mitigation prior to and/or during construction would be needed.</p> <p>No cultural resources were recorded at the remaining five catchments.</p>
Environmental Justice	NI	The proposed action would have no disproportionately high or adverse human health or other environmental effects on minority or low-income segments of the population. The proposed action would also have no effect on low-income or minority populations.
Farmlands (Prime or Unique)	NP	There are no prime or unique farmlands within the project areas.
Floodplains	NI	No actions are proposed that would result in permanent fills or diversions, or placement of permanent facilities, in floodplains or special flood or hazard areas. In addition, according to the Federal Emergency Management Agency Flood Insurance Rate Maps, none of the catchments are located within a 100-year floodplain. The catchments are located in zones of minimal or unknown flooding hazard.
Invasive, Non-native Species	NI	There are currently no known invasive species or noxious weeds at Catchment Nos. 9025, 9026, 9029, and 9590. Scotch thistle (<i>Onopordum acanthium</i>) is present at Catchment No. 9753. Common mullein (<i>Verbascum thapsus</i>) is present at Catchment No. 8051. Measures to prevent the spread of invasive and noxious weeds have been built into the proposed action. No impacts from the proposed action are therefore anticipated.
Native American Religious Concerns	NP	During consultations with American Indian Tribes who claim cultural affiliation to northern Arizona, no Native American religious concerns have been identified in relation to redeveloping wildlife water catchments.
Threatened, Endangered, or Candidate Plant Species	NP	No Threatened, Endangered, or Candidate plant species occur in the project areas (see Sensitive Species in the Administrative Record).
Threatened, Endangered, or Candidate Animal Species	NI	<p>None of the catchment sites are within any critical habitat that has been designated or proposed under the ESA, and no Federally listed species are known or suspected to occur at any of these locations.</p> <p>The California condor may occasionally fly over or feed in the area at any time of year. California condors are federally listed as endangered and a population of these condors was reintroduced on the Arizona Strip in 1996. This population is designated as experimental non-essential under Section 10(j) of the Endangered Species Act.</p> <p>Condors are strictly scavengers and prefer to eat large, dead animals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip. Although condors may either fly over or feed within the project area, they have not been observed doing so. In addition, Best Management Practices are incorporated into the proposed action (concerning site clean-up) that would minimize the likelihood of impacts to condors. This project may affect, but is not likely to adversely affect California condors.</p> <p>No other federally listed species are known or suspected to occur in the area.</p>
Wastes (hazardous or solid)	NP	No known hazardous or solid waste issues occur in the project areas.

Resource	Determination*	Rationale for Determination
Water Quality (drinking/ground)	NI	No permanent springs or continuously flowing streams are located at any of the six catchments. Additionally, there is no connection to any drinking or groundwater sources. Therefore, redevelopment of the water catchments would not affect water quality.
Wetlands/Riparian Zones	NP	There are no wetlands/riparian zones at any of the six catchment sites.
Wild and Scenic Rivers	NP	There are no Wild and Scenic River segments classified as designated, eligible, or suitable within the project areas.
Wilderness	NP	None of the six catchment sites are located within designated wilderness.
Livestock Grazing	NI	Each of the water catchments is located within an active grazing allotment. However, the catchments are currently fenced to exclude livestock, and would remain fenced. Thus, redevelopment of the water catchments would not affect livestock grazing.
Woodland/Forestry	NI	Redevelopment of the water catchments would not affect the availability of, or access to, these resources because the proposed action would not close any areas to collection of woodland products.
Vegetation	PI	Disturbance to vegetation could occur during construction, maintenance and water hauling.
BLM or State Sensitive Plants	NP	No BLM or State Sensitive Plants resources are known to occur in the project areas.
Wildlife (including sensitive species and migratory birds)	PI	Disturbance to wildlife could occur during construction, water hauling, and maintenance activities, including the potential loss of vegetation and, consequently, the potential short-term loss of wildlife habitat, as well as increased noise and soil compaction.
Soils	NI	All soils are mesic (i.e., moderately moist), semiarid soils that are extremely gravelly silt and clay loams. All construction activities would occur in previously disturbed areas; therefore, the proposed action would not affect soils beyond the existing conditions.
Recreation	PI	Disturbance to the recreating public could occur during construction activities, including increased noise as well as reduced short-term opportunities for solitude. Not implementing the proposed action could result in increased disturbance to recreation users from additional water hauling activities as the existing water catchments fail.
Visual Resources	PI	Short-term alteration to the visual setting of the project areas could occur during and immediately after construction activities.
Geology/Mineral Resources/Energy Production	NI	None of the catchments are expected to affect geology, mineral resources, or energy production because the proposed action would not close any areas to mineral development and would not alter any known geologic features.
Paleontology	NP	No paleontological resources are known to occur in the project areas.
Lands/Access	NI	Access to public lands would not be altered or impaired by implementation of the proposed action. No other land issues have been identified in connection with the proposed action.
Fuels/Fire Management	NI	The Mt. Trumbull fuels and restoration project is ongoing in the area. Fire managers are aware of catchment locations in the area and plan their activities with these locations in mind. Redevelopment of the six water catchments would not affect fire management.
Socioeconomic Values	NI	The economic base of the Arizona Strip is mainly ranching with a few gypsum/selenite mines and uranium operations. Nearby communities are supported by tourism (including outdoor recreation), construction, and light industry. The social aspect involves remote, unpopulated settings with moderate to high opportunities for solitude. Redevelopment of the proposed water catchments would have no effect on the economy or social aspect of the region since there would be no displacements or disruption to established businesses or uses of the area.

Resource	Determination*	Rationale for Determination
Wild Horses and Burros	NP	Disturbances to wild horses and burros would not occur because none of the six water catchments are located within a wild horse or burro herd management area.
Wilderness Characteristics	NP	None of the catchments are located within an area managed to maintain wilderness characteristics.

3.2 RESOURCES BROUGHT FORWARD FOR ANALYSIS

3.2.1 Vegetation

Topography varies from mountainous terrain, with rolling hills and mature forests, to open flats of desert scrub; elevation within the project area ranges from approximately 6,280 feet to 7,280 feet.

Vegetation was classified to the Ecological Zone level according to the Ecological Zones on the GCPNM map (BLM 2008a). Catchment Nos. 9025 and 9590 are located in the Great Basin Ecological Zone. The dominant plant species in this Ecological Zone are sagebrush, pinyon pine, and juniper. Extensive pinyon-juniper woodlands dominate the mountains and plateaus, with grass and shrubs prevalent in the valleys. Catchment Nos. 9753, 8051, 9026, and 9029 are located in the Ponderosa Pine Forest Ecological Zone. The dominant plant species in this zone is ponderosa pine.

3.2.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species

Wildlife species present within the project areas are typical of Great Basin and Colorado Plateau pinyon-juniper and ponderosa pine communities. Mammals that use the area include jackrabbits, coyotes, mule deer, Kaibab squirrels, mountain lions, and several bat species. Birds common to the area are listed in section 3.2.2.2. Reptiles that may be found at the project areas include midget faded rattlesnake, Gilbert's skink, and western fence lizard. Amphibians that may be present include Woodhouse's toad, Pacific treefrog, and Great Plains toad.

3.2.2.1 Mule Deer

Mule deer can be found throughout the Arizona Strip. Concentrations occur on Black Rock and Poverty Mountains, on Mt. Trumbull, in the Buckskin Mountains and in the Kanab Creek areas. Mule deer are generally found in association with more open habitats. Typical mule deer habitat is rough, steep canyons sparsely vegetated with brushy pockets that carve their way down through open grasslands. Mule deer often bed in juniper thickets or other shrubby areas. GCPNM, with its rolling topography, ponderosa pine forests, and open chained areas is prime habitat on the Arizona Strip.

Mule deer do not typically use only one water source within their home ranges. Mule deer in semi-arid desert environments will freely move 1.5 miles to find water, but as you move away from water sources deer are found at decreasing densities (Heffelfinger et al. 2006; Wood et al. 1970). Therefore, it is beneficial to have multiple water sources dedicated to wildlife within a 3 mile radius so they can utilize different portions of the habitat throughout the year. This can be important if one area has experienced a drought or palatable species are not at optimum levels. It also reduces the pressure on each individual catchment, reduces the need for water hauling, ensures adequate water is available per individual, and reduces the risk of a water source going completely dry. Mule deer are particularly dependent on reliable

water during fawning and lactation periods. This period is typically from May through July and into August, correlating with the warmest time of year. Having reliable water sources spaced no more than 3 miles apart reduces individual stress to these animals, aiding successful recruitment of fawns.

Water sources can have a major influence on the distribution and movements of deer in semi-arid environments (Watkins, et al. 2007), particularly in summer. During summer, does are often distributed closer to water than bucks, presumably because of their increased need for water during lactation (Boroski & Mossman 1996). Water developments appear to increase mule deer populations (deVos & Clarkson 1990). Thus, numerous waters have been developed to improve mule deer distribution across the landscape and to sustain healthy populations.

Five of the six catchments are located within “summer crucial” range with the remaining catchment (Ponderosa - #9753) located in “summer” range.

3.2.2.2 Migratory Birds

The Migratory Bird Treaty Act (MBTA) protects against the take of migratory birds, their nests, and eggs except as permitted. Various migratory birds use the project area for foraging. Bird species that were observed during the biological evaluation (SWCA 2011) and other visits by BLM biologists include; mourning dove, hairy woodpecker, acorn woodpecker, northern flicker, plumbeous vireo, common raven, western scrub-jay, pinyon jay, Steller’s jay, mountain chickadee, pygmy nuthatch, white-breasted nuthatch, brown creeper, western bluebird, Townsend’s solitaire, Grace’s warbler, spotted towhee, dark-eyed junco, red crossbill, and evening grosbeak. No active nests were observed at any of the project areas, however these can be difficult to detect without intensive searching. Birds that are typically common in pinyon-juniper woodlands or ponderosa pine forests that were not observed due to the timing of site visits (i.e. ash-throated flycatcher, Cassin’s finch, juniper titmouse, etc.) should also be considered present in the project area (Gillihan 2006, Block & Finch 1997).

3.2.2.3 Sensitive Species

Habitat requirements and potential for occurrence of BLM Sensitive species are available in the project record (SWCA 2011). Based on the presence of suitable habitat and/or historical records of occurrence, the following BLM Sensitive species may occur:

Golden eagle (*Aquila chrysaetos*), northern goshawk (*Accipiter gentilis*), pinyon jay (*Gymnorhinus cyanocephalus*), Allen’s big-eared bat (*Idionycteris phyllotis*), greater western mastiff bat (*Eumops perotis californicus*), spotted bat (*Euderma maculatum*), and Townsend’s big-eared bat (*Corynorhinus townsendii*).

Golden eagle (*Aquila chrysaetos*)

Habitat and Range Requirements. Typically found in open country, prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. Black-tailed jackrabbits and rock squirrels are the main prey species taken (Eakle and Grubb 1986). Carrion also provides an important food source, especially during the winter months. Nesting occurs on rock ledges, cliffs, or in large trees. Several alternate nests may be used by one pair and the same nests may be used in consecutive years or the pair may shift to an alternate nest site in different years. In Arizona they occur in mountainous areas and vacate desert areas after breeding. Nests were observed at elevations between 4,000 and 10,000 feet. Nests are commonly found on cliff ledges; however, ponderosa pine, junipers, and rock outcrops are also used as nest sites.

Habitat Evaluation and Suitability. There are occurrence records within 3 miles of all of the project areas except Snap Rim (AZHGIS 2011). All of the catchments are located in or adjacent to mountainous terrain, cliffs, or woodlands with open areas. Potential nest sites occur in the vicinity of all of the catchments, especially the Lion catchment (#8051), which has large ponderosa pines adjacent to the catchment. However, no active nests are known to occur within the project area. Golden eagles forage over a large area and may utilize the area for hunting and scavenging. The presence of the water catchments may attract small mammals, which are prey species for golden eagle.

Northern goshawk (*Accipiter gentilis*)

Habitat and Range Requirements. In Arizona, northern goshawks are found in coniferous forests in the northern, north-central, and eastern parts of the state at elevations ranging between 4,750 to 9,120 feet (AGFD 1996). Goshawks are also found in pine-oak habitats in isolated mountain ranges in southeastern Arizona. Goshawks in montane areas may winter on or near their home ranges or descend to lower elevations in woodlands, riparian areas, or scrublands (Reynolds et al. 1992). Northern goshawks generally nest in stands of mature trees with a home range of up to 6,000 acres which includes a nest area of 30 acres, a post-fledgling family area of 420 acres, and a foraging area of 5,400 acres (Reynolds et al. 1992). In GCPNM goshawks most frequently occupy ponderosa pine forests. Their nest sites are typically located on northerly slopes with canopy cover of 50% or greater (Reynolds et al. 1992). Goshawks are opportunistic hunters that prey on a variety of birds and small mammals. Their main prey habitat attributes include snags, downed logs, woody debris, large trees, openings, and herbaceous and woody understories. Because goshawks are visually limited in habitats with dense understories, an open understory enhances detection and capture of prey (Reynolds et al. 1992).

Habitat Evaluation and Suitability. Several successful nesting attempts have been documented within the project area. 13 documented nesting attempts have resulted in 28 fledglings in the Mt. Trumbull area from 1986-2006 (not all years surveyed - Franklin 2006). The Uinkaret Plateau section (Mt. Trumbull and Mt. Logan area) of the project area contains enough ponderosa pine habitat (18,465 acres) to potentially support 3-4 nesting pairs of goshawks. The Snap Rim catchment site (#9590) is located entirely within pinyon-juniper woodlands and does not represent typical goshawk nesting habitat but may provide habitat components desirable for foraging or winter use.

Pinyon jay (*Gymnorhinus cyanocephalus*)

Habitat and Range Requirements. The pinyon jay is a medium-sized corvid that inhabits much of the intermountain west and is particularly associated with pinyon-juniper ecosystems. Pinyon jays are highly social birds that nest communally and form large flocks that may number into the hundreds. Pinyon jays harvest seeds of pinyon pine, and to a lesser extent ponderosa and limber pine, during the fall and cache these seeds for use in late winter and early spring when other food sources are scarce (Balda & Bateman 1971). Caches are often located in areas that receive little snow, such as under pine and juniper tree crowns or on south slopes where snow melts early, allowing the caches to be accessible during late winter and early spring (Wiggins 2005). Spatial memory is highly developed in pinyon jays and cache relocation is efficient and reliable (Stotz & Balda 1995). Seeds that are not relocated and consumed will often germinate and contribute to pinyon pine regeneration.

Pinyon jay habitat preferences include mosaics of large tracts of pinyon-juniper woodlands especially those areas that contain large, mature, seed-producing pinyon pines, and relatively open structure with mixed shrubs (especially sagebrush) and grasses (Gabaldon 1979, Latta et al. 1999). One nesting colony of pinyon jays typically requires an area of about 230 acres for nesting and about 5,120 acres for total home range (Balda & Bateman 1971).

Habitat Evaluation and Suitability. The areas surrounding the Snap Rim (#9590), Hell's Hole (#9025), and Ponderosa Burn (#9753) catchments provide the best habitat for pinyon jays. Pinyon-juniper woodlands are expansive in these areas (greater than 65% of the area within a one mile radius) and are sufficient to support nesting colonies of pinyon jays. A flock of approximately 40 pinyon jays was documented in 2012 one mile east of the Ponderosa Burn catchment (Langston, personal obs.).

Allen's (Mexican) big-eared bat (*Idionycteris phyllotis*)

Habitat and Range Requirements. Allen's big-eared bat usually inhabits forested areas of the mountainous southwest and is relatively common in pine-oak forested canyons and coniferous forests; however, it also may occur in non-forested, arid habitats. At most sites where this species occurs, cliffs, outcroppings, boulder piles, or lava flows are found nearby. Day roosts may include rock shelters, caves, trees and mines. Seasonal movements and winter whereabouts and activities are unknown (Best et al. 2007). Their elevational distribution ranges from 1,320 to 9,800 feet, and their main food source is small moths gleaned from surfaces or in flight (AGFD 2001). These bats are known to use stock ponds as water and food sources but are theorized as too large-bodied to drink from water catchments (Herder 1996).

Habitat Evaluation and Suitability. The project areas contain coniferous forests and arid habitats that occur near lava flows, cliffs, and outcroppings. Allen's big-eared bats have been captured at 3 mist-net sites on the Uinkaret Plateau and 2 sites on the Shivwits Plateau and are expected to forage within the project area.

Greater western mastiff bat (*Eumops perotis californicus*)

Habitat and Range Requirements. Found in desert scrub near cliffs, preferring rugged rocky canyons with abundant crevices. They prefer crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet. These bats prefer to wedge themselves in the backs of cracks or crevices where they narrow down considerably. Entrances to roosting crevices are usually horizontal but facing downward which facilitates entry and exit (AGFD 2002). They are known to forage at least 15 miles from the nearest likely roosting sites.

Habitat Evaluation and Suitability. None of the catchment areas contain suitable roosting sites but these areas may be used for foraging. However, this bat prefers to forage over large open bodies of water (e.g. ponds, reservoirs etc. (AGFD 2002). Greater western mastiff bats have been captured at 1 mist-net location on the Uinkaret Plateau and at 2 sites on the Shivwits Plateau.

Spotted bat (*Euderma maculatum*)

Habitat and Range Requirements. Spotted bats are found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah to conifer forests in northern Arizona and other western states. They are found in desert scrub, riparian, pinyon-juniper, and montane coniferous forests at elevations up to 8,670 feet. They roost in small cracks found in cliffs and stony outcrops. They forage on large flying insects, primarily moths (AGFD 2003b).

Habitat Evaluation and Suitability. The project areas contain pinyon-juniper and pine-oak forests that have numerous high cliffs and rocky outcrops surrounding the areas. None of the catchment locations

contain suitable roosting habitat; however, the catchment sites may be used during foraging activities. Spotted bats have been captured at 4 mist-net locations on the Uinkaret Plateau and 2 locations on the Shivwits Plateau.

Townsend's big-eared bat (*Corynorhinus townsendii*)

Habitat and Range Requirements. In Arizona, summer day roosts are found in caves and mines from desert scrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In winter, they hibernate in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state (AGFD 2003a). These bats prefer to hang from open ceilings in caves or mines and do not use crevices.

Habitat Evaluation and Suitability. None of the catchment areas contain suitable roosting sites but these areas are likely used for foraging, especially those catchments that are located in pinyon-juniper woodlands (Sherwin et al. 2000). Townsend's big-eared bats have been captured at 11 mist-net locations on the Uinkaret Plateau, including at the Sawmill (#9026), Lion (#8051), and Turkey Track (#9029) catchments, and at 2 locations on the Shivwits Plateau.

3.2.3 Recreation

All six catchments are located in rugged, isolated areas, accessible by unimproved roads that are exposed to a low concentration of users. According to the GCPNM RMP, all six catchments are within the Shivwits Frontier Resource Management Zone, within the Parashant Special Recreation Management Area.

All six catchments are within GCPNM. The Monument exhibits a high degree of naturalness with a relatively low concentration of users; motorized travel is permitted in the monument. The catchments are in remote areas of the monument; however, camping, hiking, hunting, backpacking, , horseback riding, wildlife observation, and photography are popular activities.

The Recreation Opportunity Spectrum (ROS) system used by BLM is a framework for outdoor recreation managers and policymakers who make decisions regarding both the allocation and management of opportunities for recreation. ROS conditions, under this framework, range from modern and developed to primitive and undeveloped. Under the ROS system, Catchment Nos. 9025, 9026, 9029, and 9590 are in areas classified as "semi-primitive, motorized", Catchment No. 8051 is "roaded natural" and Catchment No. 9753 is "rural".

Catchment No. 9590 is located in AGFD Game Management Unit 13B and the remaining five catchments are within GMU 13A. Several hunting seasons are authorized by AGFD in these management units including general deer season; archery-only non-permit deer season; general turkey open season; and general bighorn sheep open season.

3.2.4 Visual Resources

BLM inventories and classifies public lands in order to identify and maintain areas that contain important scenic qualities; the Visual Resource Inventory classification system is based on a combination of three elements, including scenic quality, visual sensitivity, and distance zones, with the most important to visitors probably being scenic quality (BLM 1986). Scenic quality is described as the visual appeal of an area. The rating is based on seven key factors: landform, vegetation, water, color, adjacent scenery,

scarcity, and cultural modifications. BLM lands fall into one of four Visual Resource Management (VRM) classes.

Catchment Nos. 9025, 8051, 9753, 9026, and 9029 are within areas designated VRM Class II; and Catchment No. 9590 is within an area designated VRM Class III.

The management objective for VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape (BLM 1986, 2008a).

The management objective for VRM Class III is to partially retain the existing character of the landscape with no more than moderate changes to the landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM 2008a).

3.2.5 Cultural Resources

All six catchments were surveyed for cultural resources in 2011 (SWCA 2011b). The footprint of each existing catchment is less than 1 acre; however, 4 acres were surveyed at each catchment. The access roads to the catchments were not surveyed.

One archaeological site—AZ A:14:284 (Arizona State Museum [ASM])—was identified at Catchment No. 9590 (Snap Rim). AZ A:14:284 (ASM) is a prehistoric site consisting of a large artifact scatter of flaked stone and one ground stone mano. The site was disturbed by construction of the existing catchment and surrounding fence. The site is considered a substantial cultural resource and has the potential for the presence of subsurface cultural deposits at this location (SWCA 2011b). Additional archaeological work at this site was recommended prior to and/or during any ground-disturbing activities. No other archaeological sites were identified.

Chapter 4

ENVIRONMENTAL CONSEQUENCES

This section includes a discussion of the environmental consequences (including a description of direct and indirect impacts, and cumulative effects, if any). Impacts are defined as modifications to the existing condition of the environment and/or probable future condition that would be brought about by implementation of one of the alternatives.

Impacts can be direct or indirect; direct impacts are those effects that are caused by the action or alternative and occur at the same time and place, while indirect effects are those effects that are caused by or would result from an alternative and are later in time or in a different place but that are still reasonably certain to occur. Cumulative effects are generally assessed using the environmental impacts of past, present, and reasonably foreseeable future actions within the project areas.

The impact analyses in the following sections were based on knowledge of the resources and the sites, review of existing literature information provided by experts and other agencies, and professional judgment.

4.1 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.1.1 Vegetation

Construction activities would result in approximately 1.0 acre of short-term disturbance at each catchment site. After construction is completed, the area of long-term disturbance at each catchment site (the apron area, trough area, and access area that allows for routine maintenance) would be approximately 0.1 acre. The renovations have been designed to minimize impacts on vegetation by restricting construction activities to the existing catchment footprint and immediate vicinity. In most cases, disturbance to vegetation during construction would consist of the short-term loss of shrubs, grasses, and forbs. Uprooting of any trees and cacti would be avoided. Maintenance and water hauling activities would intermittently result in minor trampling of vegetation within and adjacent to the catchment sites, but the increase in water-storage capacity under the proposed action would reduce the frequency of water hauling trips.

These impacts would be offset by revegetation efforts. After construction is complete, excavated dirt would be recontoured throughout the disturbed areas. Dead and downed plant material, as well as existing rock debris, would be placed on top of the disturbed area to revegetate and camouflage the catchment areas. Any removed topsoil would be replaced and a BLM-approved seed mix would be applied to the area to aid in revegetation. Therefore, any impacts to vegetation would be short term until construction activities are complete and the area is revegetated.

4.1.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species

Water is essential for all animals. Wildlife such as mule deer, Merriam's turkey, bats and migratory birds in particular depend on reliable water sources. Rosenstock et al. (2004) recorded the use of water

catchments by 29 game and nongame wildlife species in southwest Arizona. When ambient temperatures are high, it is reasonable to assume that survival and productivity of wildlife could be adversely affected by a lack of water. In semi-arid regions, such as the areas where the catchments addressed in this EA are located, water catchments can be beneficial in combination with adequate foraging areas (Rosenstock et al. 1999). Wildlife would traditionally use water catchments during the hottest, driest months of the year when natural water sources dry up.

4.1.2.1 Mule Deer

As described in Section 4.1.1 above, construction activities would result in approximately 1.0 acre of short-term disturbance per catchment (6 acres total). After construction is completed, the area of long-term habitat modification at each catchment site would be approximately 0.1 acre. This is a negligible loss of habitat, compared with the relative amount of habitat available in the surrounding landscape. The proposed improvements have been designed to minimize impacts to vegetation by restricting construction to the existing catchment footprint and immediate vicinity; impacts would be mostly to shrubs, forbs, and grasses. The amount of disturbance to shrubs, forbs, and grasses would not hinder mule deer ability to forage. The cleared land would temporarily reduce habitat in the areas surrounding each catchment; however, the areas would be so small, relative to the overall foraging habitat and range available across the surrounding landscape, that impacts would be negligible. In addition, construction areas (short-term disturbance) would be reseeded to aid in revegetation of the areas, which would result in no net loss of habitat.

Mule deer would likely avoid the catchment areas and be temporarily displaced during renovation activities which are estimated to take about two weeks at each catchment. Construction activities and human presence would result in a localized and temporary increase in noise that would likely cause mule deer to temporarily avoid the catchment vicinity and find an alternate source of water for the duration of renovations. Although deer would be temporarily displaced, once redevelopment of the catchments is completed, the availability of water would be improved by decreasing the amount of water lost through leaking and evaporation at the catchment. Thus, the long-term benefits of a consistent water source for mule deer would outweigh any short-term adverse impacts that could result from catchment construction.

4.1.2.2 Migratory Birds

Renovation activities would result in a temporary loss of habitat, soil compaction, and construction noise at each site. Construction activities would result in approximately 1.0 acre of short-term disturbance while long-term disturbance would be approximately 0.1 acre at each catchment site. This is a negligible loss of habitat compared with the relative amount of habitat available in the surrounding landscape. The proposed improvements have been designed to minimize impacts to vegetation by restricting construction to the existing catchment footprint and immediate vicinity; impacts would be mostly to shrubs, forbs, and grasses. The amount of disturbance to vegetation would be negligible and would not hinder migratory birds' ability to forage. The short-term loss of vegetation at each catchment could result in a short-term reduction of migratory bird habitat. Clearing a 75 ft. radius of concealing cover around the immediate location of the drinker may reduce habitat for some shrub-dependent species. The cleared land could impact migratory birds that use the project areas for foraging, migration, and breeding by temporarily reducing habitat in the area surrounding each catchment. However, the area would be so small, relative to the overall foraging, migration, and breeding habitat available in the landscape, that impacts from cleared land would be minor. In addition, disturbed areas would be reseeded to aid in revegetation of the area, which would result in no net loss of forbs and grasses. Lastly, upon completion of the renovation, some bird species would benefit long-term by having a reliable water source for drinking and bathing (O'Brien et al. 2006, Lynn et al. 2006).

If construction occurs in early spring, short-term impacts to migratory birds as a result of human presence and noise could impact individual birds that arrive early to breeding sites and could lead to abandonment of early breeding and/or nesting attempts. Equipment associated with construction may also generally affect migratory birds as a result of soil compaction and noise. The increased noise and construction activity would occur only in the short term (2 weeks at each catchment). In the long term, occasional water catchment maintenance would have a negligible impact to migratory birds.

Impacts to migratory birds would be minimized by implementing the best management practices listed in Section 2.1.1. (i.e., measures would be taken to protect active bird nests). Additionally, by minimizing disturbance to existing sites, migratory birds would have access to the vegetation for cover and as an area to forage once construction is complete.

4.1.2.3 Sensitive Species

Golden eagle (*Aquila chrysaetos*)

No known nesting sites would be impacted by construction activities and no potential nest sites would be altered by the proposed action. Habitat for golden eagle prey species would not be altered. Access to reliable water sources, especially during drought conditions, would benefit many small mammals and birds that golden eagles prey upon. Black-tailed jackrabbits, an important prey species for golden eagles, have been documented to use water catchments (Rosenstock et al. 2004, O'Brien et al. 2006). The presence of properly functioning wildlife catchments may benefit golden eagles by providing reliable water sources to prey species.

Northern goshawk (*Accipiter gentilis*)

As described in Chapter 3, northern goshawks have been documented within ponderosa pine forests in the project area on the Uinkaret Plateau. This portion of the project area includes suitable nesting, foraging, and post-fledgling habitat, as well as openings, herbaceous and woody understories, and other habitat attributes of northern goshawk prey species. The proposed action would not alter habitat components necessary for goshawk nesting or foraging (high canopy cover, large tree size classes, open understory). Goshawk prey abundance may be impacted in the short-term through vegetation and understory removal in the immediate vicinity of each catchment but these impacts are negligible given the insignificant area of disturbance (5 total acres in or near ponderosa pine) and the large amount of foraging habitat (18,465 acres) in the project area. The Snap Rim catchment (#9590) lies entirely within pinyon-juniper woodlands which does not represent typical goshawk nesting habitat and would therefore have no impact to goshawks. Although the proposed action could have minor short-term impacts (2 weeks at each catchment) to individual northern goshawks due to disturbance from construction activities, no impacts to the species (i.e., a trend toward Federal listing or loss of viability) are expected.

Pinyon jay (*Gymnorhinus cyanocephalus*)

Snap Rim (#9590), Hell's Hole (#9025), and Ponderosa Burn (#9753) catchments are located in areas that provide habitat for pinyon jays. Pinyon-juniper woodlands are expansive in these areas and are sufficient to support nesting colonies of pinyon jays. No habitat alteration in pinyon-juniper overstory is proposed at these catchments and pinyon pine seed crops would not be impacted. Pinyon jays may avoid each catchment site during short-term construction disturbance but would have ample undisturbed foraging habitat available. Lynn et al. (2006) observed that resident birds in southwest Arizona frequently utilize catchments for drinking and bathing and Johnson et al. (2011) captured pinyon jays for a telemetry study at a frequently used wildlife guzzler. Langston has documented use of a wildlife drinker by pinyon jays

on the Arizona Strip (2012, personal obs.). Reliable water sources located within or near pinyon jay territories during the summer months would have beneficial impacts to pinyon jays.

Allen's (Mexican) big-eared bat (*Idionycteris phyllotis*)

There are no rock shelters, caves, or mines that would be impacted within the project area. The presence of water catchments within the foraging habitat of Allen's big-eared bat would enhance the foraging efforts of this species (personal communication, Angela McIntire, AGFD Bat Management Coordinator January 9, 2008) by increasing the amount of moths in the area. Therefore, the proposed action would have a beneficial impact to Allen's big-eared bat.

Greater western mastiff bat (*Eumops perotis californicus*)

No suitable roosting areas occur at any of the catchment sites. However, given the long distances that these bats travel from roosts for foraging (up to 15 miles) they may occur at project sites. Disturbance from construction activities should not impact foraging behavior because work on the catchments would be conducted during daylight hours. No impacts to the species are expected.

Spotted bat (*Euderma maculatum*)

None of the catchments contain suitable roosting habitat; however, the catchment sites may be used during foraging activities. Disturbance from construction activities should not impact foraging behavior because work on the catchments would be conducted during daylight hours. The increase in water availability at the catchments may result in an increase in the population numbers for prey species of spotted bats. No impacts to the species are expected.

Townsend's big-eared bat (*Corynorhinus townsendii*)

None of the catchments contain suitable roosting habitat; however, the catchment sites are likely used during foraging activities based on occurrence data within the project area. Disturbance from construction activities would not impact foraging because work on the catchments would be conducted during daylight hours. The increase in water availability at the catchments may result in an increase in the population numbers for prey species of Townsend's big-eared bats. No impacts to the species are expected.

4.1.3 Recreation

Inconvenience to the recreating public would occur during catchment renovation activities, and would include an increase in noise and dust at each catchment site, as well as the reduced ability for users to avoid the sights, sounds, and evidence of other people. The presence of construction equipment and workers would temporarily result in a reduced opportunity for solitude in the vicinity of the catchments.

Water catchments provide opportunities for hunters to locate wildlife; construction activities at each catchment may cause wildlife seeking hydration to seek alternate sources of water. However, these disturbances would only last approximately two weeks and would be localized to each catchment location.

Once construction is complete, wildlife would be attracted to the catchments, which would increase opportunities for recreational viewing (and/or hunting) wildlife. Renovation activities would result in a temporary, short-term reduction of recreation opportunities. Impacts on the remote and rustic settings of the area would be minimized by treating aboveground structures with materials and colors that match or

blend in with the surrounding areas. The reduced need for routine maintenance inspections and water hauling trips would reduce the already minimal recreational distractions caused by maintenance inspection trips and AGFD personnel. Beneficial effects could occur because of increased mule deer presence in more areas of GCPNM, resulting in more recreational sitings and hunting opportunities. The proposed action would therefore have minor direct and indirect impacts to recreation.

4.1.4 Visual Resources

Catchment Nos. 9025, 8051, 9753, 9026, and 9029 are located in areas designated as Class II; Catchment No. 9590 is located in an area designated as VRM Class III. Short-term impacts to visual resources associated with the proposed action would occur from the soil and vegetation disturbance during and immediately following renovation activities at each catchment site. Vegetation would be reclaimed at each site, and in turn, visual quality would return to its existing condition. Airborne dust would be visible during renovation activities at each catchment site because of the increased use of motorized vehicles and equipment, but it would be temporary and would cease once renovation activities have been completed. All of the proposed catchments are located within areas dominated by ponderosa pine or pinyon/juniper woodlands. None of the catchments is in a location that is likely to be seen by most observers. All locations have water catchments currently in place. The only change would be the increased size of the catchments and catchment facilities. Redevelopment of all the catchments would implement the following actions to minimize visual impacts: 1) natural material, such as dead vegetation and rock debris, would be returned to the disturbed area; 2) above ground components would be painted colors that blend in with the surrounding landscape (i.e., medium grays or earthen colors); 3) pigment would be added to cement used in the berm and trough so that they blend in with the surroundings; 4) rocks from the area would be used to avoid or mask straight lines (i.e., placed atop berms); and 5) if installed, precipitation/water-level gauge components would be kept as inconspicuous as possible employing various camouflage techniques, such as using native materials and/or paint colors that blend in with the surrounding landscape and no reflective materials. All of these actions would reduce the visual contrast.

To effectively evaluate the visual impacts of the proposed action, a visual contrast rating for each site from key observation points was prepared. The visual contrast rating is a systematic process used by the BLM to analyze the potential visual impact of proposed projects and activities. It is intended to assist BLM personnel to apply the basic principles of design in the resolution of visual impacts. The basic philosophy underlying the system is that the degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. This assessment process provides a means for determining visual impacts from a proposed project (BLM 1986). Visual Contrast Rating worksheets were prepared for each catchment site and can be found in the project record.

In general, the catchments are well hidden within the surrounding terrain and forest. They are generally not visible to the casual observer. The proposed action includes measures to minimize visual impacts from renovation – all aboveground components would be treated with materials and colors that match or blend with the surrounding area to reduce the visual impacts of the structure; natural material (such as dead vegetation and rock debris) would be returned to the disturbed area; and rocks from the area would be used to avoid or mask straight lines (i.e., placed atop berms).

The characteristic landscape of each catchment area already includes disturbance from the existing catchments; therefore, the level of change would be low. The proposed action activities and results may be seen but they are not expected to attract the attention of a casual observer. To the extent possible, the basic elements of form, line, color, and texture found in the predominant natural features of the

characteristic landscape would be repeated. Since the project areas are well hidden, are generally not visible to the casual observer, and would blend with the surrounding landscape, all of the proposed water catchments are expected to meet their VRM class objectives.

4.1.5 Cultural Resources

Potential impacts to cultural resources could result from unmonitored construction at Catchment No. 9590 (Snap Rim). However, to prevent any potential adverse impacts, Best Management Practices (BMP) described in section 2.1.1 would be followed. These BMPs include but are not limited to requiring a BLM-approved archaeologist be present on-site to monitor construction activities and have the authority to cease all ground-disturbing activities in the event of a discovery in order to consult with the BLM about any appropriate subsequent actions.

No cultural resources were discovered at the remaining five catchment locations (SWCA 2011b). However, stipulations pertaining to cultural and paleontological resources, remains, funerary objects, and artifacts listed in section 2.1.1 would be followed at all sites.

4.1.6 Cumulative Impacts of Proposed Action

Known past, present, and future actions in the general vicinity of the proposed catchment redevelopment projects include 24 additional water catchment renovation projects (Catchment Nos. 613–620, 645–648, 758, 816, 818, 828, 829, 837, 838, 953, 985, 4486, 9748, and 9637) which have similar disturbance areas (0.1 acres at each site). There would be a minor impact to wildlife, resulting from the loss of habitat, soil compaction, and noise from construction (30 acres cumulatively). However, these impacts would be short-term and negligible when considering the relative amount of habitat available in the surrounding landscape. Long term habitat alteration from the redevelopment of these catchments would be about 3 acres. The existence of these catchments cumulatively benefits wildlife by providing adequate distribution of consistent water sources in the region.

Habitat enhancement projects planned for the GCPNM include prescribed burns, seeding, and chemical or mechanical treatments. Specific projects that have occurred or are likely to occur in the reasonably foreseeable future are:

- The Uinkaret Mountains Vegetation Management Plan includes several proposed treatments spread over 126,536 acres including Mt Trumbull, Mt Logan and surrounding areas. Some of these areas have been subject to previous vegetative treatments (mechanical techniques and prescribed burning) as part of the Mt Trumbull Ecosystem Restoration Project (ERP). The objectives of these proposed treatments are to continue treatment of units established in the Phase I and II of the Mt. Trumbull ERP as well as expanding the treatments to the landscape that includes the Mt. Trumbull/Mt. Logan area. The effect of implementing these treatments at the landscape level would reduce the potential for large, high intensity wildfires, better protecting the ponderosa pine ecosystem. The Uinkaret Mountains Vegetation Management Plan would also treat additional portions of the area to restore and maintain vegetation communities within their natural ranges of composition, structure, and function, thereby improving ecological function, and improving public and firefighter safety in the event of a wildfire.
- The Shivwits Plateau Vegetation Project area encompasses 356,820 acres (200,000 within GCPNM). The goals of this project are to achieve desired plant community objectives identified in the GCPNM RMP, including restoring native woodland, shrubland, and grassland

communities on the Shivwits Plateau. Management prescriptions would generally use landscape level techniques such as prescribed fire, mechanical treatment, and chemical treatment. Treatments in the ponderosa pine communities would focus on restoring open stand characteristics of pre-settlement forests. Treatments in the pinyon-juniper communities would reduce stand density and allow increases in shrub density, forb cover, and plant species richness, which in turn would reduce erosion and provide enhanced habitat conditions for wildlife.

4.2 ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE

4.2.1 Vegetation

Under the no action alternative, no additional disturbances would occur at the existing catchments, although periodic water hauling to and maintenance of the existing facilities would intermittently result in minor trampling of vegetation adjacent to the existing catchment sites and could provide additional opportunities for the spread of invasive-species seed. However, since these areas are already disturbed, new impacts would be negligible.

4.2.2 Wildlife, Including Mule Deer, Migratory Birds, and Sensitive Species

Under the no action alternative, no construction activities and, therefore, no additional ground disturbance would occur other than the current measures implemented by AGFD. Periodic water hauling to and routine maintenance activities of the existing facilities would intermittently result in minor, temporary disturbances to wildlife. The no action alternative would, therefore, have minor, site-specific impacts to wildlife resulting from ongoing maintenance activities. However, under the no action alternative, more disturbance could occur as the frequency of water hauling trips and maintenance activities may increase because of the current inefficiency of the collection systems. Lack of available water due to catchment inefficiency could also adversely impact wildlife dependent on these water sources as they search for water during periods of drought.

4.2.2.1 Mule Deer

Mule deer in the region rely on these catchments as a supplemental water source. Lack of available water due to catchment failure could adversely impact mule deer dependent on these water sources as they search for water during periods of drought. Therefore, the No Action alternative would impact mule deer resulting from unreliable and insufficient water availability and from displacement or disturbance from increased water hauling and maintenance activities.

4.2.2.2 Migratory Birds

Periodic water hauling to (and maintenance of) the existing facilities would intermittently result in minor, temporary disturbances to birds from human presence (i.e., noise and vibration) on access roads and at each catchment. The No Action alternative would, therefore, have minor, site-specific impacts to migratory birds resulting from ongoing water hauling and maintenance activities. The No Action alternative would also impact migratory birds due to unreliable and insufficient water availability.

4.2.2.3 Sensitive Species

Golden eagle (*Aquila chrysaetos*)

The No Action alternative could result in an increase of minor disturbance-related impacts to individual golden eagles as well as a reduced prey base from a lack of reliable water sources. However, these impacts would be relatively minor and no adverse impacts to the species (i.e., a trend toward Federal listing or loss of viability) are expected.

Northern goshawk (*Accipiter gentilis*)

Negative impacts may occur to northern goshawks if routine maintenance and water hauling trips are currently disturbing nesting habitat or causing a reduction in northern goshawk prey abundance through vegetation and understory trampling. Although the No Action alternative could have minor impacts to individual northern goshawks, there would be no additional impacts beyond current conditions and no adverse impacts to the species are expected.

Pinyon jay (*Gymnorhinus cyanocephalus*)

Pinyon-juniper woodlands are expansive in these areas and would remain sufficient to support nesting colonies of pinyon jays under the No Action alternative. The No Action alternative could have minor impacts to individual pinyon jays from disturbance caused by increased water hauling. The No Action alternative would also impact pinyon jays due to unreliable and insufficient water availability. However, no adverse impacts to the species (i.e., a trend toward Federal listing or loss of viability) are expected.

Allen's (Mexican) big-eared bat (*Idionycteris phyllotis*)

There are no rock shelters, caves, or mines that would be impacted within the project area. The presence of the existing water catchments has enhanced the foraging habitat of this species. Routine maintenance and water hauling are needed for continued use of these catchments by this species. Moths and other insects that are primary food resources for Allen's big-eared bats are also attracted to catchments. The No Action alternative would have slight negative impacts to Allen's big-eared bat but no adverse impacts to the species (i.e., a trend toward Federal listing or loss of viability) are expected.

Greater western mastiff bat (*Eumops perotis californicus*)

Greater western mastiff bats forage over large bodies of water and would likely be unaffected by increased maintenance activity due to deteriorating catchments. Disturbance caused by increased water hauling would occur during daylight hours and would not impact these bats. No impacts to the species are expected.

Spotted bat (*Euderma maculatum*)

None of the catchments contain suitable roosting habitat; however, they may be used during foraging activities for this species. The existing catchments provide a supplemental water source that is available to wildlife inhabiting the area around the catchments and in the nearby vicinity; however, the water supply may be unreliable due to deterioration of the catchments and a decrease in water storage efficiency. The No Action alternative would have slight negative impacts to spotted bats but no adverse impacts to the species (i.e., a trend toward Federal listing or loss of viability) are expected.

Townsend's big-eared bat (*Corynorhinus townsendii*)

None of the catchments contain suitable roosting habitat; however, the catchment sites are likely used during foraging activities based on occurrence data within the project area. Disturbance caused by increased water hauling would occur during daylight hours and would not impact the foraging behavior of this species. No impacts to the species are expected.

4.2.3 Recreation

Under the No Action alternative no construction would occur. Minimal disturbance to recreational users would continue because of periodic water hauling and maintenance activities. However, this disturbance would be intermittent and localized and would not by itself reduce the recreational opportunities available in the area. Continued deterioration of the water catchments would lead to a lack of reliable water sources available to mule deer, turkey, and nongame species, possibly reducing populations or shifting species distribution out of the project area. This could lead to diminished opportunities for hunting and wildlife viewing in the project area.

4.2.4 Visual Resources

Catchment Nos. 9025, 8051, 9753, 9026, and 9029 are located in areas designated as Class II; Catchment No. 9590 is located in an area designated as VRM Class III. Because no renovations would occur with this alternative, the existing visual character at each catchment would not be affected.

4.2.5 Cultural Resources

Under the No Action alternative no construction would occur. Cultural artifacts at catchment no. 9590 would not be affected and monitoring by an archeologist would not be needed. Water hauling activities would be limited to designated open roads and would not affect subsurface artifacts.

4.2.6 Cumulative Impacts of the No Action Alternative

Additional water catchment renovation projects are planned for the GCPNM (Catchment Nos. 613–620, 645–648, 758, 816, 818, 828, 829, 837, 838, 953, 985, 4486, 9748, and 9637). As described in Section 4.1.6, other habitat enhancement projects planned for the ASFO and GCPNM include prescribed burns, seeding, and vegetation treatments. Short-term impacts could result from reconstruction activities at other catchments in the region; these impacts would be similar to the direct and indirect impacts from the proposed action. Alternatively, there could be long-term, cumulatively adverse impacts as these catchments begin to fail. If the existing catchments fail, and are not replaced, there is the potential for reduced animal distribution across the landscape, as well as reduced population numbers, as water sources become less reliable. The management objective of providing the necessary habitat components (including reliable waters) may therefore not be as successfully met under this alternative as compared to the proposed action.

Chapter 5

CONSULTATION AND COORDINATION

5.1 INTRODUCTON

The issue identification section of Chapter 1, as well as Table 3.1, identifies those issues analyzed in detail in Chapter 4. Table 3.1 also lists all resources/elements of the human environment that have been considered by BLM resource specialists to determine whether they would be potentially affected by the proposed action; this table provides the rationale for resources/elements that were considered but not analyzed further. The issues were identified through the internal and interagency involvement process described in section 5.2 below.

5.2 SUMMARY OF INTERAGENCY AND PUBLIC PARTICIPATION

One comment letter was received from the Arizona Game and Fish Department (AGFD) during the internal scoping and review period. The comments contained in this letter addressed wildlife use of catchments. To address the comments, information was added to the EA for clarification purposes and/or minor edits/corrections were made to the EA. The modifications made to the EA did not change the overall analysis and conclusions of the EA. Similar comments have been grouped together; comments are summarized below in Table 5-1 along with either a response or reference to where the comment is addressed in the EA.

Table 5.1. List of Comments and Responses/References

Comment	Response
AGFD suggested that tree trimming at the Snap Rim Catchment might be necessary and that this should be reflected in the Proposed Action.	We agree and text was added to the Proposed Action (Section 2.1) that states that some tree trimming would be necessary.
AGFD wanted vegetation clearing along fence perimeters to be included in the Proposed Action.	We agree and the following text was added to the Proposed Action (Section 2.1): “Vegetation along the fence perimeter would also be cleared to a width of approximately 3 feet on either side of the fence to allow for fence construction and reduced long-term maintenance.”
AGFD was concerned about the effects of trenches on wildlife.	We agree that open trenches do pose a threat to many wildlife species. The following statement is included in the EA in section 2.1.1 Best Management Practices:

	<ul style="list-style-type: none"> • Construction trenches would be designed with 45° to 60° slopes to meet Occupational Health and Safety Administration standards for trenching and to prevent wildlife from becoming entrapped. Trenches would be checked each day for entrapped animals before commencing work activities.
<p>AGFD suggested that the EA could be strengthened by emphasizing the benefits of catchments to nongame species and recommended that the BLM consider a list of studies.</p>	<p>We agree that nongame species do benefit from water catchments. In the EA we determined that redeveloping the six water catchments would benefit pinyon jays, Allen’s big-eared bats, and golden eagles. The recommended Rosenstock et al. (2004) study was a good source of information on this topic and after reviewing it we included it in the wildlife discussion in the EA. We refrained from claiming too much benefit to bats from increased drinking water availability because a study by Rabe and Rosenstock (2005) found limited bat use at wildlife drinkers similar to those in this project, possibly due to small surface area.</p>
<p>AGFD noted that there was some confusion regarding the route numbers used in the EA since they had maps with numbers labeled that were different from the BLM’s.</p>	<p>The routes we are referring to are the same. For example, 1666 is the “route number” as defined by our GIS database, P3010 is the “route evaluation number” which was an identifier used during the travel management process. We agree that this is confusing so both numbers now appear in the text.</p>

A Notice of Availability (NOA) letter was sent to the Arizona Strip District NEPA mailing list on March 18, 2013 to initiate a 30-day public comment period. The NOA letter and EA were available online starting on March 20, 2013 and comments were received until April 19, 2013. Three responses were received during the comment period. Two comments were general statements of support for the proposed action and one comment was a request for an electronic copy of the EA.

5.3 LIST OF CONTRIBUTORS AND REVIEWERS

The following tables list persons who contributed to the preparation of this EA.

Table 5.2. List of BLM Preparers/Reviewers

Name	Title	Responsible for the Following Program
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Whit Bunting	Team Lead, Range	Range, Weeds
Laurie Ford	Team Lead, Lands & Geological Sciences	Lands & Realty
Diana Hawks	Team Lead, Recreation/Wilderness/Archaeology	Recreation, Wilderness, Visual Resources
Jon Jasper	Outdoor Recreation Planner	Visual Resources, Wilderness Characteristics
Shawn Langston	Wildlife Biologist	Project Lead, Special-Status Animals, Wildlife
Pamela D. McAlpin	Monument Manager	Project Oversight
Jacquilyn Roaque	Rangeland Management Specialist	Special Status Plants, Vegetation, Range
John Sims	Supervisory Law Enforcement	Law Enforcement
Bob Smith	Soil Scientist	Soil, Water, Air
Richard Spotts	Environmental Coordinator	NEPA Compliance
David Van Alfen	Archaeologist	Cultural Resources

Table 5.3. Non-Federal Agency EA Reviewers

Name	Agency/Organization	Title
Cara Bellavia	SWCA Environmental Consultants	Project Manager/Environmental Planner
Ryan Rausch	SWCA Environmental Consultants	Environmental Planner
Adrienne Tremblay	SWCA Environmental Consultants	Archaeologist
Shari Bell	SWCA Environmental Consultants	Publication Specialist
Eleanor Gladding	SWCA Environmental Consultants	Biologist
Jeremy Doschka	SWCA Environmental Consultants	Biologist
Andi Rogers	Arizona Game and Fish Department	Habitat Specialist
Sarah Reif	Arizona Game and Fish Department	Habitat Program Manager
Joseph Currie	Arizona Game and Fish Department	Habitat Planning Program Manager
LeAnn Skrzynski	Kaibab Paiute Tribe	Environmental Program Director
Peter Bungart	Hualapai Tribe	Cultural Staff
Dawn Hubbs	Hualapai Tribe	Cultural Staff

Chapter 6

LITERATURE CITED

- Arizona Department of Environmental Quality (ADEQ). 2007. *ADEQ Geographic Information System (GIS) eMaps*. Available at: <http://gisweb.azdeq.gov/website/emaps/wqd/watersheds>. Accessed February 20, 2008.
- Arizona Game and Fish Department (AGFD). 1996. *Wildlife of Special Concern in Arizona*. Phoenix.
- Arizona Game and Fish Department (AGFD). 2001. *Idionycteris phyllotis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2002. *Eumops perotis californicus*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2003a. *Corynorhinus townsendii pallescens*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2003b. *Euderma maculatum*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2005. Arizona Game and Fish Department Wildlife Water Development Standards. Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2007. Wildlife 2012 Strategic Plan. Arizona Game and Fish Department, Phoenix, Arizona.
- Arizona Heritage Geographic Information System (AZHGIS). 2007. Arizona Game and Fish Department online environmental review tool. Available at: <http://www.azgfd.gov/hgis>. Accessed November 12, 2007.
- Balda, R.P. and G.C. Bateman. 1971. Flocking and Annual Cycle of the Piñon Jay (*Gymnorhinus cyanocephalus*). *The Condor* 73:287-302.
- Best, T.L., M.J. Harvey, and J.S. Altenbach. 2007. Available at: <http://www.msb.unm.edu/mammals/batcall/accounts/accountsbase/idiphy.html>. Accessed December 21, 2007.
- Block, W.M. and D.M. Finch, technical editors. 1997. Songbird Ecology in Southwestern Ponderosa Pine Forests: a Literature Review. Gen. Tech. Rep. RM-GTR-292. Fort Collins, CO: US Dept of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 152 pp.
- Boroski, B.B. and A.S. Mossman. 1996. Distribution of Mule Deer in Relation to Water Sources in Northern California. *The Journal of Wildlife Management* 60:770-776.

- deVos, Jr., J.C. and R.W. Clarkson. 1990. A historic review of Arizona's water developments with discussions on benefits to wildlife, water quality and design considerations, p. 157-165. In: G.K. Tsukamoto and S.J. Stiver (eds.), Proc. Wildlife Water Development Symposium, 30 Nov.-1 Dec. 1988, Las Vegas, Nev. Nevada Chapter The Wildl. Soc., USDI BLM, and Nevada Dept. Wildl.
- Eakle, W.L. and T.G. Grubb. 1986. Prey Remains from Golden Eagle Nests in Central Arizona. *Western Birds* 17:87-89.
- Gabaldon, D.J. 1979. Factors Involved in Nest Site Selection by Piñon Jays. Ph.D. Dissertation, Northern Arizona University, Flagstaff, AZ.
- Gillihan, S.W. 2006. Sharing the Land with Pinyon-Juniper Birds. Partners in Flight Western Working Group. Salt Lake City, UT.
- Haug, E.A., B.A. Milsap, and M.S. Martell. 1993. Burrowing owl (*Speotyto cunicularia*). In *The Birds of North America*, edited by A. Poole and F. Gill. No. 61. Philadelphia: The Birds of North America.
- Heffelfinger, J. R., C. Brewer, C. H. Alcalá-Galván, B. Hale, D. L. Weybright, B. F. Wakeling, L. H. Carpenter, and N. L. Dodd. 2006. *Habitat Guidelines for Mule Deer: Southwest Deserts Ecoregion*. Mule Deer Working Group, Western Association of Fish and Wildlife Agencies.
- Herder, Michael. 1996. *Northern Arizona Bat Roost Inventory*. Heritage Grant Report No. 196035. Prepared for Arizona Game and Fish Department.
- Hervert, J.J. and P.R. Krausman. 1986. Desert Mule Deer Use of Water Developments in Arizona. *Journal of Wildlife Management* 50:670-676.
- Johnson, K., L. Wickersham, T. Neville, J. Wickersham, J. Smith, M. Baumann, and C. Finley. 2011. Habitat Use at Multiple Scales by Pinyon-Juniper Birds on Department of Defense Lands: Landscape Scale. Natural Heritage New Mexico Publication 10-GTR-360.
- Latta, M.J., C.J. Beardmore, and T.E. Corman. 1999. Arizona Partners in Flight Bird Conservation Plan. Version 1.0. Nongame and Endangered Wildlife Program Technical Report 142. Arizona Game and Fish Department, Phoenix, Arizona.
- Logan Simpson Design. 2005. A Cultural Resources Survey of 77.4 Acres for Improvements to 17 Water Catchments North of the Grand Canyon, Mohave and Coconino Counties, Arizona. Technical Report No. 055162. Tempe: Logan Simpson Design Inc.
- Lynn, J.C., C.L. Chambers, and S.S. Rosenstock. 2006. Use of Wildlife Water Developments by Birds in Southwest Arizona During Migration. *Wildlife Society Bulletin* 34:592-601.
- McIntire, Angela. 2008. AGFD Bat Management Coordinator. Verbal communication. January 8, 2008.
- O'Brien, C.S., R.B. Waddell, S.S. Rosenstock, and M.J. Rabe. 2006. Wildlife Use of Water Catchments in Southwest Arizona. *Wildlife Society Bulletin* 34:582-591.
- Remington, R.E., W.E. Werner, K.R. Rautenstrauch, and P.R. Krausman. 1984. Desert Mule Deer Use of New Permanent Water Sources, p. 92-93. In: P.R. Krausman and N.S. Smith (eds.), *Deer in the Southwest: a Workshop*. Arizona Cooperative Wildlife Research Unit, University of Arizona, School of Renewable and Natural Resources, Tucson, Arizona.

- Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. *Management Recommendations for the Northern Goshawk in the Southwestern United States*. General Technical Report RM-217. Fort Collins, Colorado: U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Roberts, R.F. 1977. Big Game Guzzlers. *Rangeman's Journal* 4:80–82.
- Rosenstock, S.S., W.B. Ballard, and J.C. de Vos, Jr. 1999. Viewpoint: Benefits and Impacts of Wildlife Water Developments. *Journal of Range Management* 52:302–311.
- Rosenstock, S.S., M.J. Rabe, C.S. O'Brian, and R.B. Waddell. 2004. Studies of Wildlife Water Developments in SW Arizona: wildlife use, water quality, wildlife diseases, wildlife mortalities, and influences of native pollinators. Arizona Game and Fish Dept., Research Branch Technical Guidance number 8, Phoenix, AZ.
- Sherwin, R.E., D. Stricklan and D.S. Rogers. 2000. Roosting Affinities of Townsend's Big-eared Bat (*Corynorhinus townsendii*) in Northern Utah. *Journal of Mammalogy* 81:939-947.
- Stotz, N.G. and R.P. Balda. 1995. Cache and Recovery Behavior of Wild Pinyon Jays in Northern Arizona. *The Southwestern Naturalist* 40:180-184.
- SWCA Environmental Consultants (SWCA). 2011. Biological Evaluation for the Proposed Redevelopment of Seven Water Catchments on the Arizona Strip, Mohave County, Arizona. Phoenix: SWCA Environmental Consultants.
- SWCA Environmental Consultants (SWCA). 2011b. *Archaeological Survey of Seven Proposed Water Catchments Located on the Arizona Strip, Mohave County, Arizona*. Cultural Resources Report No. 11-257. Phoenix: SWCA Environmental Consultants.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 1992. *Revised Mt. Trumbull Habitat Management Plan*. Bureau of Land Management, Arizona Strip Field Office.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 1986. *Visual Resource Inventory*. BLM Manual H-8410-1. Bureau of Land Management, Washington D.C.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 1995. *Interim Management Policy for Lands Under Wilderness Review*. BLM Manual H-8550-1. Bureau of Land Management, Washington D.C.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 2003. *Consideration of Wilderness Characteristics in Land Use Plans (Excluding Alaska)*. BLM Instruction Memorandum IM-2003-275. Bureau of Land Management, Washington, D.C.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 2008a. *Grand Canyon-Parashant National Monument Resource Management Plan*. Bureau of Land Management, Arizona Strip District Office.
- U.S. Department of the Interior, Bureau of Land Management (BLM). 2008b. *National Environmental Policy Act*. BLM Handbook H-1790-1. Bureau of Land Management, Washington D.C.
- Watkins, B.E., C. J. Bishop, E. J. Bergman, A. Bronson, B. Hale, B. F. Wakeling, L. H. Carpenter, and D. W. Lutz. 2007. *Habitat Guidelines for Mule Deer: Colorado Plateau Shrubland and Forest Ecoregion*. Mule Deer Working Group, Western Association of Fish and Wildlife Agencies.

- Wiggins, D.A. 2005. Pinyon Jay (*Gymnorhinus cyanocephalus*): a Technical Conservation Assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: <http://www.fs.fed.us/r2/projects/scp/assessments/pinyonjay.pdf>
- Wood, J. E., T. S. Bickle, W. Evans, J. C. Germany, and V. W. Howard, Jr. 1970. *The Fort Stanton Mule Deer Herd*. New Mexico State University Agricultural Experiment Station Bulletin 567, Las Cruces, New Mexico.

Appendix A

SITE PHOTOGRAPHS OF EXISTING CATCHMENTS



Photo A1. Catchment No. 9025, Hell's Hole



Photo A2. Catchment No. 8051, Lion



Photo A3. Catchment No. 9753, Ponderosa Burn



Photo A4. Catchment No. 9026, Sawmill



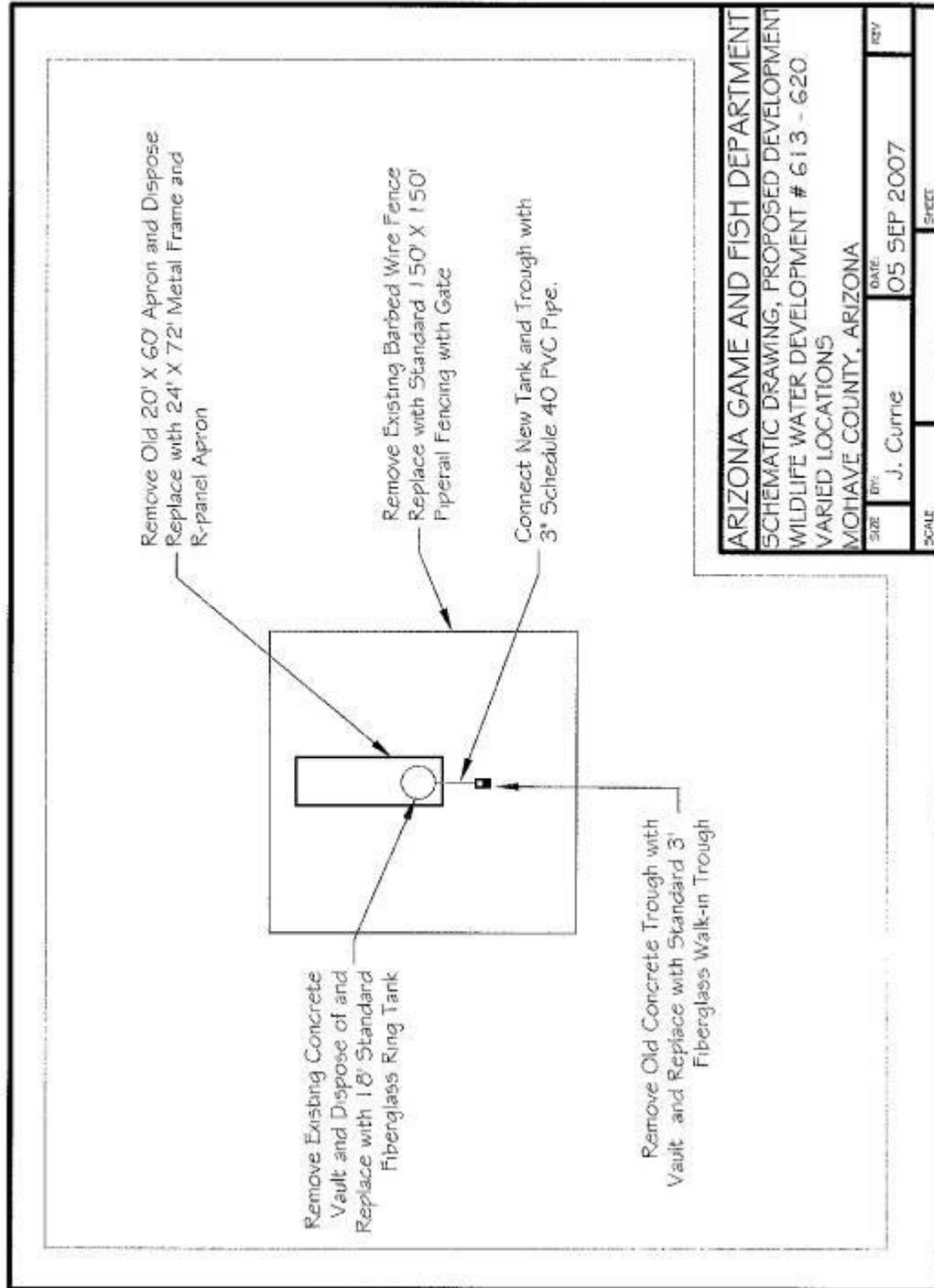
Photo A5. Catchment No. 9029, Turkey Track



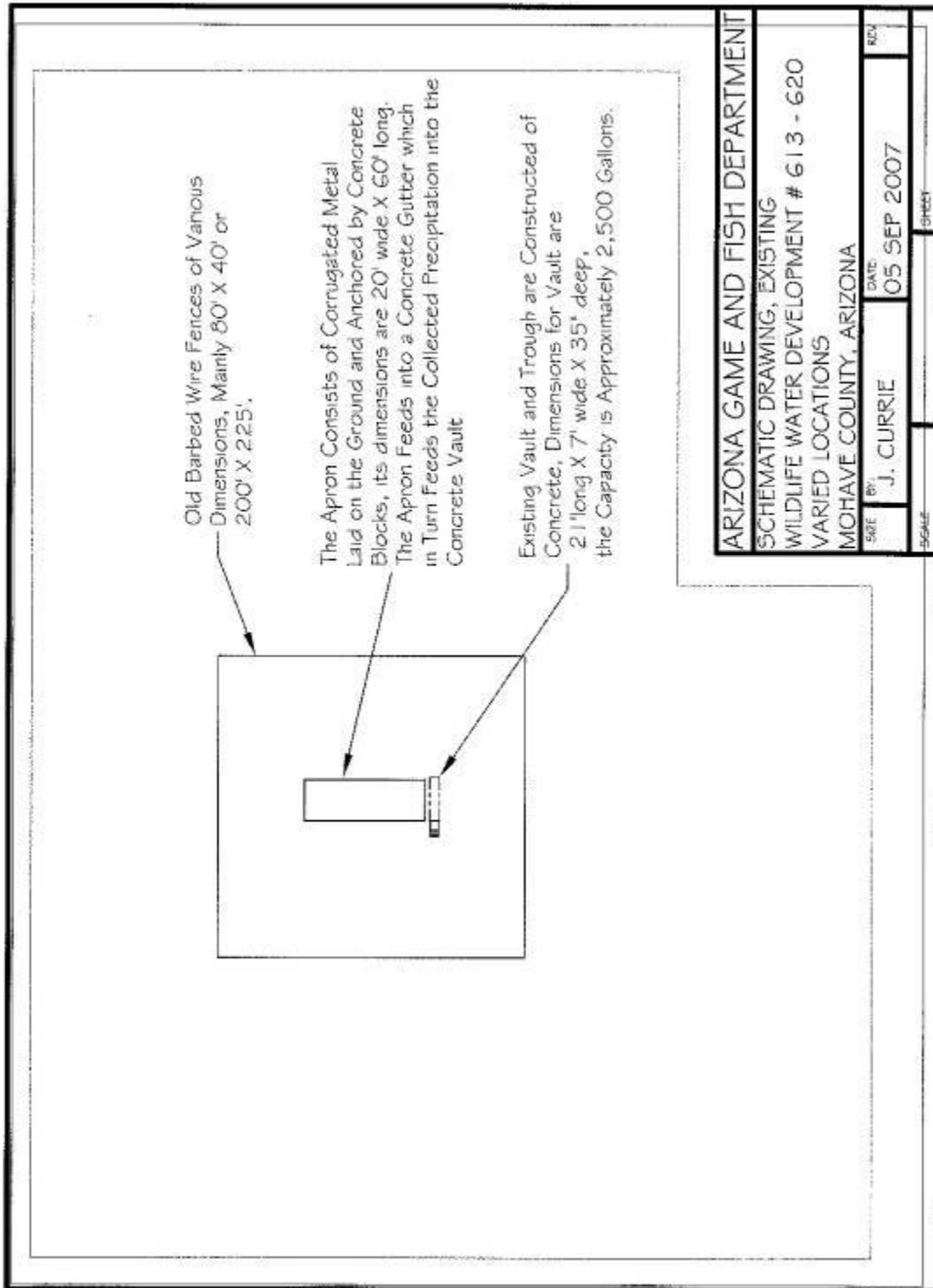
Photo A6. Catchment No. 9590, Snap Rim

Appendix B

SCHEMATIC DRAWINGS OF THE PROPOSED CATCHMENTS



ARIZONA GAME AND FISH DEPARTMENT			
SCHEMATIC DRAWING, PROPOSED DEVELOPMENT			
WILDLIFE WATER DEVELOPMENT # 613 - 620			
VARIED LOCATIONS			
MOHAVE COUNTY, ARIZONA			
SIZE	BY	DATE	REV
	J. Currie	05 SEP 2007	
SCALE			SHEET



ARIZONA GAME AND FISH DEPARTMENT

SCHMATIC DRAWING, EXISTING

WILDLIFE WATER DEVELOPMENT # 613 - 620

VARIED LOCATIONS

MOHAVE COUNTY, ARIZONA

DATE: 05 SEP 2007

BY: J. CURRIE

NOV

SCALE

SHEET

**FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD
REDEVELOPMENT OF SIX WATER CATCHMENTS ON THE ARIZONA STRIP
(DOI-BLM-AZ-A030-2012-0003-EA)**

FONSI: Based on the analysis of potential environmental impacts contained in the above referenced environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that the action will not have a significant effect on the human environment. An environmental impact statement is therefore not required.

Decision: It is my decision to approve the proposed Redevelopment of Six Water Catchments on the Arizona Strip within the Grand Canyon-Parashant National Monument, Mohave County, Arizona, as described in the proposed action of *DOI-BLM-AZ-A030-2012-0003-EA*. These six catchments are between 25 and 47 years old and have deteriorated over time, therefore redevelopment is needed to provide reliable water sources for mule deer and other wildlife as stated in the EA.

The following best management practices will be implemented as part of this project.

- Construction activities will be limited to daylight hours to minimize impacts to wildlife.
- Construction activities will be limited to periods when the soil and ground surface are not wet in order to avoid soil compaction issues.
- Construction activities will be conducted in a manner that will minimize disturbance to existing vegetation by limiting vegetation thinning and restricting construction activities to the existing catchment footprints, within the existing fenced areas.
- If an active bird nest is observed before or during construction, measures will be taken to protect the nest.
- The locations of any campsites for construction crews will be coordinated with the BLM and located in previously disturbed areas.
- Vehicles and equipment will be power washed off-site before construction activities at each catchment site to minimize the risk of spreading weeds; this will include cleaning all equipment before entering the Arizona Strip, as well as cleaning it between work sites. The project areas will be monitored for weeds after construction until they are recovered/revegetated, or for 2 years, whichever comes sooner.
- Soil disturbance associated with construction activities will be limited by restricting disturbance to the existing catchment footprints and immediate vicinity.
- Excavated soil will be recontoured throughout the project area (includes scraping and piling).
- Any topsoil will be replaced and a BLM-approved seed mix will be applied to aid in revegetation.
- The following actions will be implemented to minimize visual impacts associated with the redevelopment activities: 1) natural material, such as dead vegetation and rock debris, will be returned to the disturbed area; 2) above ground components will be painted colors that blend in with the surrounding landscape (i.e., medium grays or earthen colors); 3) pigment will be added to cement used in the berm and trough so that they

blend in with the surroundings; 4) rocks from the area will be used to avoid or mask straight lines (i.e., placed atop berms); and 5) if installed, precipitation/water-level gauge components will be kept as inconspicuous as possible employing various camouflage techniques, such as using native materials and/or paint colors that blend in with the surrounding landscape and no reflective materials.

- If amphibians (any life stage) are present at the time of reconstruction, they will be transferred to buckets using the water from the wildlife catchment and returned when construction is complete.
- During construction, vehicular traffic will be restricted to designated routes.
- Construction trenches will be designed with 45° to 60° slopes to meet Occupational Health and Safety Administration standards for trenching and to prevent wildlife from becoming entrapped. Trenches will be checked each day for entrapped animals before commencing work activities.
- Construction debris will be removed to an appropriate landfill location.
- All construction activities at the Snap Rim catchment (#9590) will be monitored by an archaeologist.
- Any cultural (historic/prehistoric site or object) or paleontological resource (fossil remains of plants or animals) discovered at the catchment sites will immediately be reported to the authorized officer or his/her designee. All operations in the immediate area of the discovery shall be suspended until written authorization to proceed is issued. An evaluation of the discovery shall be made by a qualified archaeologist or paleontologist to determine appropriate actions to prevent the loss of significant cultural or scientifically important paleontological values.
- If in connection with this work any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, operations in the immediate area of the discovery will stop, the remains and objects will be protected, and the GCPNM Manager will be immediately notified. The immediate area of the discovery will be protected until notified by the GCPNM Manager that operations may resume.
- Construction of the improvements is not anticipated to affect waters of the United States; however, the AGFD will obtain appropriate permits when necessary before project implementation.
- Those involved with catchment redevelopment and/or maintenance activities will notify the BLM wildlife team lead if California condors visit the worksite while permitted activities are underway. Project activities will be modified or delayed where adverse effects to condors may result.
- The project site will be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up) to minimize the likelihood of condors visiting the site. BLM staff may conduct site visits to the area to ensure adequate clean-up measures are taken.

Plan Conformance:

The action is in conformance with the *Grand Canyon-Parashant National Monument Resource Management Plan (RMP)*, approved on January 29, 2008. The action is consistent with the decisions

contained within this RMP (Section 1.4 of the EA). It has also been determined that the action will not conflict with other decisions throughout this RMP.

Alternatives Considered:

The EA considered two alternatives: the No Action Alternative and the Proposed Action. The No Action Alternative was not selected.

Rationale for the Decision:

This decision has been made after considering impacts to the resources described and analyzed in the EA. I have determined that the action does not result in any undue or unnecessary environmental degradation and is in conformance with the Grand Canyon-Parashant National Monument RMP.

Administrative Review or Appeal Opportunities

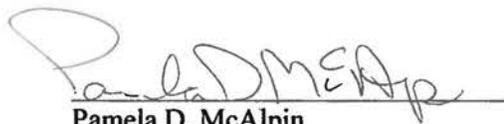
This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 and the attached Form 1842-1. If an appeal is taken, your notice of appeal must be filed at the Grand Canyon-Parashant National Monument, 345 East Riverside Drive, St. George, Utah 84790, within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (request) pursuant to regulations 43 CFR 4.21(b) for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the Office of the Solicitor (Department of the Interior, Office of the Field Solicitor, Sandra Day O'Connor U.S. Court House #404, 401 West Washington Street SPC44, Phoenix, AZ 85003-2151) (see 43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Except as otherwise provided by law or other pertinent regulations, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

Standards for Obtaining a Stay

1. The relative harm to the parties if the stay is granted or denied,
2. The likelihood of the appellant's success on the merits,
3. The likelihood of immediate and irreparable harm if the stay is not granted, and
4. Whether the public interest favors granting the stay.



Pamela D. McAlpin
Grand Canyon-Parashant National Monument Manager

5/20/2013
Date