United States Department of the Interior
Bureau of Land Management

Environmental Assessment EA-AZ-130-2007-0048

Pakoon Springs Rehabilitation

Grand Canyon – Parashant National Monument

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APPENDICES

1.0 INTRODUCTION/PURPOSE AND NEED

1.1 Introduction: Located in the Mojave Desert, Pakoon Springs is one of the few large springs on the Arizona Strip; it is the largest in the Grand Canyon-Parashant National Monument (GCPNM); and the most promising for restoration. For at least the last century, the Pakoon Springs have been developed and modified to provide water for livestock, agricultural irrigation, and domestic use. Many non-native plants and animals were introduced, including an alligator and bullfrogs. In November 2002, the United States accepted title to the Pakoon Springs Ranch (240 acres) through a donation by the Conservation Fund. The Conservation Fund purchased the 240 acre ranch with funding from the Richard K. Mellon Foundation.

1.2 Purpose: The purposes of this project are 1) to rehabilitate and enhance native biodiversity, ecological function, and the pre-development riparian habitat characteristics of Pakoon Springs; and 2) to provide an outdoor venue for natural and cultural resource education, spring restoration interpretation, and recreation on the Grand Canyon – Parashant National Monument.

1.3 Need: The need for this project is to achieve conformity with the following BLM plans and policies:

1.3.1 Arizona Strip Resource Management Plan (1992),
"Maintain, restore, or improve riparian areas to achieve a healthy and productive ecological condition for maximum long-term benefits. This can be accomplished using fire, mechanical, chemical or biological means."

1.3.2 The Standards for Rangeland Health (1997),
"Productive and diverse upland and riparian-wetland plant communities of native
species exist and are maintained."

1.3.3 The Proposed RMP Desired Future Condition for Riparian Habitats (See 1.5.4, below)

1.4 Issues Identified during Scoping:

1.4.1 Monument Objects:
Desert Tortoise
Ecological Diversity

1.4.2 Wildlife

1.4.3 Native endemic and predatory non-native aquatic species

1.4.4 Visual Quality

1.4.5 Recreation Values

1.4.6 Wilderness Characteristics

1.4.7 Burros and Trespass Cattle

1.5 Conformance with Existing Plans

The Proposed Action, described below, is subject to conformance with the BLM Arizona Strip District Resource Management Plan (RMP 1992), as amended. The Proposed Action is in direct conformance with the following decisions:

1.5.1 Conformance with Arizona Strip RMP (1992). The proposed action is specifically authorized by the following decisions in the RMP:

RP02 Maintain, restore, or improve riparian areas to achieve a healthy and productive ecological condition for maximum long-term benefits. This can be accomplished using fire, mechanical, chemical or biological means.

RR04.2 Provide visitor information.

RR04.6 Consider visual impacts on all proposed actions and protect scenic values by using mitigation measures, where feasible, including alternative locations, camouflage, vegetation or topographic screening, and other appropriate measures.

RR06 Implement actions to restore and/or maintain natural conditions or appearance in all areas.

RR10.3 Improve visitor service related to information, interpretation, facility development and maintenance, and safety.

RR10.5 Protect and interpret historic features.

RR12 Provide settings for recreation opportunities associated with motorized vehicle use such as exploring backcountry roads, vehicle camping and picnicking.

WS01 Manage vegetation cover towards ecological stability and sound long-term protective soil cover using mechanical, chemical, biological or fire as tools for accomplishment.

WS08 Improve water quality, water yield, and reduce erosion around springs.

WS19 Manage public lands in a manner that protects scientific, environmental, air and atmospheric, and water resource values.

The proposed action would not conflict with other decisions in the Arizona Strip District RMP (1992a).

1.5.2 Conformance with Arizona BLM Standard 3 for Rangeland Health (1997). The proposed action is specifically required by the following decision in the AZ Standards for Rangeland Health:

> Standard 3: Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

1.5.3 Conformance with the Grand Canyon – Parashant Monument Proclamation (2000) and Interim Management Policy (2001). The proposed action is specifically authorized by the following decisions in the Monument Proclamation and Interim Management Policy:

For the purpose of protecting the objects identified below, all motorized and mechanized vehicle use off road will be prohibited, except for emergency or authorized administrative purposes.

> Protection of Ecological Diversity: Resulting from the junction of two physiographic ecoregions (the Basin & Range and the Colorado Plateau) and three floristic provinces (the Mojave Desert, Great Basin, and Colorado Plateau).

Existing noxious weed and exotic species control activities should continue.

1.5.4 Conformance with BLM PRMP FEIS, 2007

Alternative A

No Action Alternative = Existing Management in 1992a RMP

Annual weed cover and density are controlled and ladder fuels and downed woody debris are limited or not present.

Disturbances such as livestock grazing, mining, and off road vehicle travel, that can potentially reduce natural vegetation cover and vigor, are managed to maintain adequate cover and mix of natural plant species.

Alternative B

A. Desired Future Conditions

Riparian areas, including Monument objects, would consist of a diversity of vertical and horizontal structures, vegetative age classes, and endemic species.

Riparian areas would 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 Arizona Standards for Rangeland Health, NPS Vital Signs, and enhance Monument objects and values.

Ecological functions and processes would be intact with vegetative species composition and cover appropriate to the site.

Where sites have the potential for over-story vegetation, the canopy cover of over-story and under-story vegetation would be at or approaching maximum density.

All riparian areas, including Monument objects, would be in, or moving towards, proper functioning condition.

All surface water would meet, or be improving towards, Arizona State water quality standards.

Flowing water systems would provide contiguous water and associated riparian vegetative cover, where possible.

Availability of surface water at seeps and springs would be appropriate for the soil type, climate, and landform and would support a diverse population of endemic plant and wildlife species.

A sufficient quantity of water with safe access for wildlife would be available, where appropriate.

Riparian communities would provide habitat for common species such as rush, cottonwood, willow, and yellow-breasted chat, as well as rare species such as Southwestern Willow (SW) Flycatcher, Common Black Hawk, Lucy's Warbler, and speckled dace where consistent with site potential.

Invasive plants and animals such as tamarisk, Russian olive, and Brown-headed Cowbird would be reduced or eliminated.

In addition to the above, riparian communities on NPS lands retain ecological integrity where natural processes maintain native plants and plant communities and are the principal influence on community and population fluctuation.

B. Pakoon Springs would be restored, emphasizing natural processes. No planned vegetation treatments would be conducted in the Riparian Ecological Zone.

(Note: Part A. of this decision: The Desired Future Conditions from the PRMP FEIS, especially "Invasive plants and animals such as tamarisk, Russian olive, and Brown-headed Cowbird would be reduced or eliminated" above, cannot be achieved by implementing part B. of this decision. The non-native invasives will persist and expand without intervention. Therefore, achievement of the Desired Future Condition would not be feasible.)

Alternative C

Same as A., above, plus:

B. The functions and processes of Pakoon Springs would be restored to within the range of natural variability or to meet Vital Sign standards and Rangeland Health Standards and either be in, or moving towards Proper Functioning condition.

The spring area could be used as habitat for special status species native to the area.

Alternative D

Same as A., above, plus:

B. The functions and processes of Pakoon Springs would be restored to within the range of natural variability or to meet Vital Sign standards and Rangeland Health Standards.

An interpretive program on the role and function of Mojave Desert springs for wildlife and indigenous people would be developed. A campground and/or picnic areas would be developed.

The spring area could be used as habitat for special status species native to the area.

Alternative E

Same as A., above, plus:

B. The functions and processes of Pakoon Springs would be restored to a combination of naturally appearing pond and flowing water habitats that meet Vital Sign standards and Rangeland Health Standards.

Relict leopard frogs, Grand Wash springsnails, or other special status species would be re-introduced to the area, provided suitable habitat exists after restoration.

The processes of restoring previously developed Mojave Desert springs, and the function of Mojave Desert springs for wildlife, indigenous people, and the historic ranching activity, could be developed for interpretation. Facilities to house the interpretive materials and enhance the visitor experience, including picnicking, could be provided.

Adequate protection (barriers, etc.) to ensure restoration efforts are not adversely impacted by visitors could be installed.

1.6 Relationship to Laws, Regulations, Other Plans

Pertinent laws include Federal Land Policy Management Act, Endangered Species Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act; Executive Order 13007, Native American Consultation Handbook (8160) and its supplement (8160-1). Plans include the Desert Tortoise Recovery Plan, Biological Opinions, the Programmatic Agreement with the State Historical Preservation Office, the 1991 FEIS on Vegetation Treatment on BLM Lands, the 2007 FEIS on Vegetation Treatment on BLM Lands, and Environmental Assessment EA-AZ-130-2007-0042, October 2007, Tamarisk Control on the Grand Canyon – Parashant National Monument.

2.0 ALTERNATIVES

2.1 Proposed Action - Alternative A

The Proposed Action would be an adaptive management project. Adaptive management is a formal, systematic, and rigorous approach to **learning from the results of management actions**, accommodating change, and improving management. Adaptive management consists of synthesizing existing knowledge, exploring alternative actions, and making explicit forecasts about their results. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying results. Actions and objectives are then adjusted based on this feedback and improved understanding to continue to try to achieve the Desired Resource Conditions. In addition, decisions, actions, and results are carefully documented and communicated to others, so that knowledge gained through experience is passed on, rather than lost when individuals move or leave the organization.

Although the pre-development condition of Pakoon Springs is unknown, the Desired Resource Condition for Pakoon Springs is a hillside seep and spring complex associated with a 5-10 acre Arizona Water Protection Fund (AWPF) Grant Contract pilot project. The outcome would be achieved through a phased approach that would allow management decisions to be made as the rehabilitation process progresses, and information is gained.

A hillside seep and spring complex consisting of hummocky, rolling topography from the uppermost ponds down slope through the agricultural fields nearest the ponds, would be rehabilitated. Removal of all berms and impoundments upstream from Fields 1 and 2 would be completed. An attempt to remove all non-native species would be made. Subsequent rehabilitation actions would be implemented in several phases that would expand to the total area restored, in a radiating manner, with the 5-10 acre AWPF pilot project located in the center. The rehabilitation processes would be implemented, using an adaptive management approach, in the following overlapping and interrelated phases:

Phase I: Non-native Fish: Eradication and Monitoring:

Non-native fish would be eradicated by channelizing the spring discharge water and application of the pesticide Rotenone. Rotenone would not be applied until an inventory for potential endemic native springsnails and fish has been completed at the springs and adjacent wash, and the resulting information evaluated. Informed decisions would be made if native endemic species are discovered, and actions would be taken to avoid extirpation. These actions could include a combination of the following actions: relocation, holding in captivity and reintroduction of individuals once the rehabilitation treatments are complete, or abandoning the Rotenone treatment. Rotenone is a naturally occurring compound produced by extraction from the roots and stems of several tropical and subtropical plant species belonging to the leguminous genera *Lonchocarpus* or *Derris*. It is formulated in pesticide products to control insects, mites, ticks, spiders, and undesirable fish. Rotenone is extremely toxic to fish and to a lesser extent, amphibians. Rotenone is believed to be moderately toxic to humans with an oral lethal dose estimated from 300 to 500 mg/kg, depending on the plants from which it was formulated.

To eradicate the non-native fish, the delivery of water to pipes associated with the former irrigation system would be eliminated. Underground pipes that may be transmitting water from individual spring sources would be severed by trenching. Abandonment of the

underground piping is necessary in order to prevent the loss of any water, through the former irrigation system, which could provide habitat for the non-native fish. All flow would be collected into a single, open channel that is easily treated with Rotenone. The existing large pond would be drained and a single channel from the uppermost pond through the large pond would be excavated. All bodies of standing water would be drained and all flow focused into a single channel for efficient applications of the pesticide. All areas of standing water, where non-native fish could find refuge during treatment, would be eliminated. Water would be prevented from spreading into broad, flat areas where fish could obtain refuge. Effectiveness of the Rotenone treatment would be monitored prior to, and after, Rotenone treatment, and periodically thereafter. Recontouring activities would commence after the success of non-native fish removal efforts have been evaluated.

Trenching for the determination of historical conditions will occur simultaneously with the trenching associated with the abandonment of underground irrigation piping. Soil profiles, at least five feet in depth and 10 feet long, would be evaluated for soil characteristics including soil moisture, soil type, hydropedology, and soil salinity. The creation of these soil profiles would also be monitored by a cultural resource specialist, as well as an ecologist, who will evaluate the trenches for evidence of pre-historic, historic, geomorphological, biological, and cultural information.

If groundwater is intersected during the soil profile evaluation, the depth to groundwater will be measured and field water-chemistry characteristics of electrical conductivity, pH, and temperature will be recorded. This information obtained from these soil profiles will be used to determine optimum channel and pool locations and the revegetation strategy during the restoration process.

Phase II: Protection from Undesirable Ungulate Use

Non-native, unallocated burros and trespass livestock would be excluded from the project area by building wire barrier fences where they will tie in with existing fence, and installing two cattle guards where roads enter/leave the project area.

Phase III: Bullfrog Elimination and Monitoring

The eradication of bullfrogs would be attempted and consist of making habitat conditions extremely unsuitable by spreading the water and preventing any water depth greater than ½" for several years throughout the spring site and immediate vicinity within the project area, as well as the application of the pesticide Rotenone in phases. Rotenone would not be applied until an inventory for native endemic springsnails and fish, has been completed at the springs and adjacent wash; and the resulting information evaluated. Informed decisions would be made if native endemic species are discovered, and actions would be taken to avoid extirpation. These actions could include a combination of the following actions: relocation, holding in captivity and reintroduction of individuals once the rehabilitation treatments are complete, or abandoning the Rotenone treatment. An attempt would be made to eliminate conditions downstream of the springs in the nearby wash, where a bullfrog population could persist, by removing water bodies greater then 1/2" in depth for several years. Effectiveness of the Rotenone treatment would be monitored prior to, and after implemented, and periodically thereafter. Any new techniques developed to eradicate bullfrogs during project implementation would be explored and considered for use on this project. Recontouring activities would take place after the success of the initial non-native bullfrog removal efforts have been evaluated.

Phase IV: Recontouring adjacent to the Spring Sources.

The elevation of the spring sources (most often in the bottom of existing ponds) would control all rehabilitation activities. The starting elevation for any spring mounds/hillside seeps or outflow channels would be the spring source elevation.

The hillside seep and spring complex would be further down slope than that which existed prior to historic disturbance. Spring sources would not be buried. The springs would not have outflow channels, but may have small rivulets of water, small areas of shallow, standing water, and/or saturated areas following recontouring. Over time, these spring channels would be expected to become more defined by natural surface flow events.

The spring sources could be directed and utilized in various ways during the implementation of the 5-10 acre pilot project. After the historical flow directions have been determined, it may be possible to divert the water from the two farthest upstream ponds (rectangular pond and pond fed by 3 ft diameter corrugated metal pipe) to the west, temporarily, in order to establish riparian/mesoriparian conditions. Following vegetation development and rehabilitation, the water would be directed back to the east. Alternatively, all of the water could be directed to the east in the direction where the water most likely flowed prior to disturbance.

Phase V: Road and Berm Removal

As the spring outflow channels are developed, roads and bermed crossings would be evaluated for abandonment, removal, and/or relocation; and rehabilitation would be phased in order to maintain existing access for project activities. Berms, built over the years to support irrigation and agricultural use of the site, would be pulled down and the landscape reshaped/recontoured around the spring sources. Roads and bermed crossings within the 5-10 acre AWPF pilot project area would be removed first.

Phase VI: Revegetation

The seep and spring complexes would be re-vegetated with native, indigenous species and result in a plant community structure composed of a native grass and forb understory with a multi-level canopy of cottonwood, Gooding's willow, *Baccharis,* and jimmyweed (*Isocoma acredenius*). The installation of plant materials would be limited to areas where sufficient soil moisture is available to support the plantings. In addition to cuttings from local sources of cottonwood, Gooding's willow, and *Baccharis*, nursery stock native to the area would be used for revegetation in areas where an irrigation system is not required. This would include cuttings installed in moist soils adjacent to spring sources and along waterways created during restoration. The main aspects of the final restoration design that would determine whether a perpetual watering system can be utilized include finish topography, distribution of water, and soil characteristics.

Phase VII: Outreach and Interpretation

Key to protecting the resources, for which the Monument was created, is to educate users and visitors regarding their importance and how to use resources sustainably and safely. An Interpretive Project Plan conforming to the objectives and settings set forth in the Proposed RMP would be developed to provide for outreach, education, and a volunteer component. Visitor experience, enhancement, and education tools could be included, and

could include rustic kiosks, wayside exhibits, signage describing site history, resource values and an explanation of the restoration process.

2.1.1 Conservation Measures, Terms and Conditions - Desert Tortoise

The following conservation measures are contained in US Fish and Wildlife Service Biological Opinion 2-21-96-F-132, and would be implemented.

Personnel education programs, well-defined operational procedures, and movement of tortoises out of harm's way shall be implemented for any activity that results in disturbance of desert tortoise habitat or may result in death or injury of a desert tortoise.

a. For each authorized project ("project" means any surface-disturbing activities proposed by the Bureau and described in the Mojave Amendment to the RMP), that may cause disturbance of desert tortoise habitat and/or death or injury of a desert tortoise, the Bureau shall designate a field contact representative (FCR) who shall be responsible for overseeing compliance with these terms and conditions and for coordination on compliance with the Service. The FCR, qualified biologist(s) approved by the Bureau, and authorized biologist shall have the authority and the responsibility to halt all project activities that are in violation of these terms and conditions. These individuals shall have a copy of the terms and conditions of this biological opinion while on the work site.

b. A desert tortoise education program shall be presented to all project personnel that may encounter tortoises; such as employees, inspectors, supervisors, contractors, and subcontractors; prior to initiation of activities that may result in disturbance of desert tortoise habitat or death or injury of desert tortoises. The education program will include discussions of the following:

1. Legal protection of the desert tortoise and sensitivity of the species to human activities;
2. A brief discussion of desert tortoise distribution and ecology;
3. The terms and conditions of Biological Opinion 2-21-96-F-123;
4. Project features designed to reduce adverse effects to desert tortoises and their habitat, and to promote the species' long-term survival;
5. Protocols during encounters with desert tortoises and associated reporting requirements; and
6. The definition of take and penalties for violations of Federal and State laws.

c. Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuel-breaks, created to enable the treatment activities to occur. If off-road is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after rehabilitation or restoration activities are completed.

d. Prior to moving a vehicle, personnel will inspect under the vehicle for tortoises. If a tortoise is found under the vehicle, the tortoise will be allowed to move away from the vehicle on its own accord, if possible.

e. Temporary access routes created during project construction shall be modified as necessary to prevent further use. Closure of access routes could be achieved by ripping, barricading, posting the route as closed, and/or seeding and planting with native plants.

f. In DWMAs/ACECs, vehicles associated with Bureau-authorized projects traveling on unpaved roads in desert tortoise habitat shall not exceed speed limits established by the Bureau as necessary to protect desert tortoises. These speed limits will generally not exceed 40 mph even on the best unpaved roads but may be much less on some roads.

g. During the tortoise active season (March 15 through October 15), project features that might trap or entangle desert tortoises such as open trenches, pits, open pipes, etc shall be covered or modified to prevent entrapment.

h. To the extent possible, project activities shall be scheduled when tortoises are inactive (October 15 through March 15).

i. If a tortoise or clutch of tortoise eggs is found in a project area, to the extent practicable activities shall be modified to avoid injuring or harming it. If activities cannot be modified, the tortoise/clutch shall be moved from harm's way, by the authorized biologist, the minimum distance possible within appropriate habitat to ensure its safety from death, injury, or collection associated with the project or other activities. The authorized biologist shall be allowed some discretion to ensure that survival of each relocated desert tortoise/clutch is likely. Desert tortoises/clutches shall not be translocated to lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for desert tortoises and their eggs shall adhere to protocols outlined in Desert Tortoise Council (1994 with 1996 revisions).

Only biologists or tortoise monitors authorized by the US Fish and Wildlife Service and Arizona Game and Fish Department shall handle desert tortoises. The authorized biologist or monitor shall maintain a record of all desert tortoises encountered during project activities. This information shall include for each desert tortoise:

- The locations and dates of observation
- General condition and health, including injuries and state of healing and whether animals voided their bladders
- Location moved from and location moved to
- Diagnostic markings (i.e. identification numbers of marked lateral scutes)

No notching of scutes or replacement of fluids with a syringe is authorized.

Desert tortoises that are handled shall be marked for future identification. An identification number (using the acrylic paint/epoxy technique) shall be placed on the 4th costal scute (Fish and Wildlife Service 1992).

j. At no time shall vehicle or equipment fluids be dumped on federal lands. All accidental spills must be reported to the Bureau and cleaned up immediately, using the best available practices according to the requirements of the law. All

spills of federally or State-listed hazardous materials that exceed reportable quantities shall be promptly reported to the appropriate State agency and the Bureau.

k. To reduce attraction of potential desert tortoise predators, project sites in desert tortoise habitat shall be maintained in a sanitary condition at all times; waste materials at those sites shall be placed in covered receptacles and disposed of promptly at an appropriate waste disposal site. "Waste" refers to all discarded matter, including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. All reasonable effort shall also be taken to reduce or eliminate water sources associated with project activities that might attract ravens and other predators.

l. Unleashed dogs shall be prohibited in project areas.

2.1.2 Monitoring:

Implementation Monitoring would consist of:

a. Completion of BLM Pesticide Application Report within 24 hours of application,
b. Documentation of proposed pesticide treatments in the BLM MIS System at the beginning of each fiscal year, and
c. Documentation of pesticide treatment completion in the BLM MIS System at the end of each fiscal year.

Effectiveness Monitoring would consist of data gathered to help provide information to direct the rehabilitation, during implementation of Phase I - as well as from the following monitoring exercises:

Discharge, field water-chemistry, and air temperature at the major spring outflow points will be monitored quarterly for the first year and semi-annually for the following two years. One representative spring source water sample shall be collected for cation, anion and trace metal laboratory analysis. Photographs will be taken at the time of each site visit from reference points.

When restoration is complete, plant growth will be monitored, and the fencing maintained every other month during the growing season. Non-natives plants will be weeded during these visits.

2.1.3 Location: Pakoon Springs Ranch, Grand Canyon – Parashant National Monument

2.1.4 Scope: Approximately 50 - 60 acres would be rehabilitated.

2.1.4.1 Duration: Implementation would be initiated during the winter of 2007-2008, and would take approximately five to ten years to complete. The following information is included in the Statement of Work for the Arizona Water Protection Fund Grant Contract, #06-137 WPF, and displays the implementation schedule:

WHAT	**WHEN**
Generate Land Survey Maps	Done

Develop Feasibility Study Plan	Done
Complete a survey for native endemic spring snails and fish	November 2007
Complete a Visual Resource Contrast Rating Evaluation	December 2007
Complete NEPA Process	December 2007
Develop Vegetation Survey Report and GIS map	December, 2007
Describe historical conditions Search the UNLV and NV Historical Society Las Vegas photo archives Searches for historical information and photographs have been completed at UNR and the NV Historical Society in Reno	December, 2007
Complete an estimate of water demand in former agricultural fields based on evapotransporation (ET)	December, 2007
Plot water surface elevations obtained during Topographic Survey, on the Land Survey Map	December, 2007
Complete the Feasibility Study and Rehabilitation Plan	December 2007
Develop a site transportation plan Road abandonment and rehabilitation should be phased based on the finalized restoration sequence in order to maintain existing access for project activities. Roads and bermed crossings within the 5-10 acre pilot project area would be removed first. Information concerning road closures and roads to be maintained would be incorporated into the Monument Travel Management Plan (Proposed RMP).	January 2008
Initiate the elimination of the delivery of water to pipes associated with the former irrigation system by trenching and re-channelizing the water.	January 2008
Build the protective fence and install cattle guards	January, 2008
Treat channelized water with Rotenone	January 2008
Initiate Bullfrog Control Efforts	March 2008
Conduct Hydrologic and Soil Surveys	April 15, 2008 Oct. 15, 2008 April 15, 2009 Oct. 15, 2009 April 15, 2010
Submit semi-annual progress reports to AWPF	April 30, 2008 October 31, 2008
Initiate recontouring at the spring sources	May 2008

Develop vegetation monitoring reports and Submit to AWPF	October 31, 2008 October 31, 2009
Develop an Interpretation Project Plan Develop ideas for visitor experience enhancement and education which may include rustic kiosks, signage, description of site history, explanation of restoration process, etc.	July 2009
Initiate recontouring of the fields	October 2009
Develop the Final Pakoon Springs Rehabilitation Report and submit to AWPF	April 30, 2010

2.2 No Action = Alternative B

Under the no action alternative, the Proposed Action would not be implemented. Existing management and use of the project area would continue subject to applicable statutes, regulations, and policies.

2.3 Alternatives Considered but not Analyzed in Detail

Enhancement of existing conditions and rehabilitation of 5-10 acres:
Enhancement of riparian vegetation community would be achieved primarily through completion of the 5-10 acre AWPF pilot project along with construction of protective fencing and cattle guard installation. No treatment or rehabilitation of former agricultural fields would occur. Limited modification of existing berms and impoundments would occur. Non-native vertebrates would not be removed.

This Alternative was not further analyzed, as it would not be in conformance with the 1992a RMP, Standard 3 for Rangeland Health, nor the Proposed RMP.

Rehabilitation of approximately 60-90 acres with construction of refugium habitat:
This alternative would result in creating the most extensive riparian community possible with existing water and maximize conservation potential of the site. A hillside seep and spring complex consisting of hummocky, rolling topography from the uppermost ponds down slope through Fields 1 and 2 would be constructed. This alternative would include the removal of all berms and impoundments upstream from Fields 1 and 2.

In addition to cuttings from local sources of cottonwood, Gooding's willow, *Baccharis*, mesquite, and jimmyweed, nursery stock would be used for revegetation in areas where an irrigation system is not required. Intensive efforts would be implemented to rid the area of non-native bullfrogs and mosquito fish. Refugium habitat would be created in line with the primary area of riparian community rehabilitation. Refugium habitat would consist of open channel and pool areas and would require the placement of large quantities of rock to form the channel and pool areas and placement of gravel for stream channel substrate, as well as consistent and intensive annual maintenance.

This alternative was not further analyzed, as it would require the creation of open water areas (streams and pools), and with proposed budgets this would not be economically feasible to implement, and especially not to maintain over the long term.

3.0 AFFECTED ENVIRONMENT - General Setting:

3.1 Critical Elements of the Human Environment not Affected by the Proposed Action

The following critical elements of the human environment are not present or are not affected by the proposed action or no action alternative evaluated in this EA, and therefore, will not be addressed:

Air Quality
Areas of Critical Environmental Concern
Environmental Justice
Prime or Unique Farmlands
Floodplains
Native American Religious Concerns
Hazardous or Solid Wastes
Wild & Scenic Rivers
Wilderness

3.2 Critical Elements of the Human Environment that May be Affected

The following critical elements of the human environment are present or may be affected by the proposed action or alternatives evaluated in this EA, and therefore, will be addressed:

3.2.1 Cultural Resources

Four cultural sites have been recorded in or near the proposed project area. These sites are AZ A:9:1 (BLM), AZA:9:9 (BLM), AZ A:9:140 (ASM), and AZ A:9:163 (ASM). Most of the sites have been heavily impacted and only a single site (AZ A:9:163 (ASM)) is considered potentially eligible for the National Register.

Historic Shed and Rock Fences: Two of these sites have a historic component that includes a single room wooden structure, rock walls, and historic trash. The structure and walls may date as early as 1905.

Pre-historic: Three sites have prehistoric components that include structural remnants and artifact scatters. The prehistoric components range from A.D. 900-1800, though undoubtedly evidence may exist for earlier occupation.

3.2.2 Threatened or Endangered Species

3.2.2.1 Mojave Desert Tortoise

The proposed project area is included within the Northeastern Mojave Recovery Unit, which is one of six Mojave Desert Tortoise recovery units established through the 1994 Recovery Plan.

The Mojave Desert Tortoise is federally listed as threatened and is found in creosote-bursage habitats below about 4,500 feet in elevation. The desert tortoise is an herbivore that spends most of its life in underground burrows. It can live 80 years and has a low reproductive rate. Data on tortoise populations in the project

area is unavailable. Desert tortoise may occasionally access the washes and springs in the area, but spend most of their time in the creosote-bursage and are not dependant upon riparian habitat.

Grand Wash Springsnails may occupy at least one of the springs (pers. Communication with Don Sada).

No other Threatened, Endangered, or Sensitive species are known to use the project area.

3.2.3 Water Quality

The most significant sources of non-point source pollution affecting Monument water are grazing, hydrologic modification, and recreation. Pollutants of concern are increased sediment and salt loads due to runoff events.

Pakoon Spring has light isotopic signatures indicating that high elevation zones are recharging this spring even though it emits at low elevation. High elevation recharge at low elevation springs is probably coming from the Virgin Mountains though there is also a chance that Pleistocene age water is recharging this spring. High discharge springs at lower elevations are likely sourced by higher elevations or older ground water. However, frequent monitoring is necessary to determine the age of the water from isotope data.

Water samples were taken in 2003, at the large pond discharge pipe and tested at the Southern Utah University water lab. The following information was provided:

pH =	7.14
Total dissolved solids =	275 mg/l (mostly sulfates w/some sodium)
Fluoride =	0.205 mg/l (just over the MCL of 0.2)
Arsenic =	11.4 mg/l (exceeding the MCL of 10.0)

3.2.4 Wetlands and Riparian Areas

Riparian scrub occurs along the ephemeral or intermittent watercourses, as well as at the seeps and springs in the proposed project area. Riparian scrub communities are characterized by a broad continuum of vegetative associations that range from mesic vegetation types to more xeric types along the usually dry washes. Riparian areas are the most productive and important ecosystems in the Monument.

Prior to historic development, Pakoon Spring was likely a saturated hillside seep and spring mound complex that drained into the dry wash located on the eastern margin of the project area. The hillside seep and spring complex is a common spring morphology in the Great Basin and Mojave Desert. These springs typically have a low discharge (less than 1 to 20 gpm) and do not have sufficient flow to prevent the overgrowth of vegetation. Similar springs do not have outflow channels, but may have small rivulets of water or small areas of shallow, standing water. Seep and spring complexes typically provide for a plant community structure composed of a grass and forb understory with a canopy composed of tree species such as cottonwood, mesquite, willow, or ash. Ideally, the plant community at Pakoon would be composed of a grass and forb understory with a multi-level canopy of cottonwood, Gooding's willow, *Baccharis*, mesquite, and jimmyweed.

Native riparian vegetation in the small wetland areas around springs is either no longer present due to intentional removal with heavy machinery and/or herbicides; or is degraded from current and historic livestock grazing. Native riparian vegetation species present include mesquite, willow, cottonwood, *Baccharis,* and jimmyweed.

Many non-native and/or invasive plant species have been introduced into the proposed project area, purposefully or accidentally. These include (but are not limited to) rose bushes, pomegranate trees, mulberry trees, palm trees, bamboo, Bermuda grass, cattails, tamarisk, cheat grass, and malta star thistle. These non-native plant species have previously been scheduled to be removed, under a separate action, during the fall of 2007.

Because there has been so much dirt moved during the development of the springs at the proposed project site, the pre-development geomorphology and hydrology is unknown. Without knowing the geomorphology and historic water flow locations and amounts, it is impossible to define a picture for the wetland and riparian restoration. Some geomorphological data can be collected and information gathered by trenching and evaluating soil profiles. This information would be used to help shape the final outcome.

3.3 Issues determined during Scoping

3.3.1 Monument Objects

From the Proclamation, Monument Objects in the proposed project area that could be affected include:

Desert Tortoise (See 3.2.2.1 above)

Ecological Diversity: Resulting from the junction of two physiographic ecoregions (the Basin & Range and the Colorado Plateau) and three floristic provinces (the Mojave Desert, Great Basin, and Colorado Plateau).

3.3.2 Wildlife

Native wildlife species that use the ponds are desert bighorn sheep, mule deer, coyotes, rabbits, rodents, reptiles, and several species of migratory birds.

3.3.3 Native and Non-native Aquatic Faunal Species

Pakoon Springs has been identified as a site for potential Relict Leopard Frog translocation, assuming that habitat restoration attempts succeed at eradicating bullfrogs. Currently Pakoon Springs is not suitable fore Relict Leopard Frogs due to the presence of predatory bullfrogs. Bullfrogs are very difficult to eradicate. Relict Leopard Frogs require streams with small within-stream pools (mostly un-vegetated) for tadpole development. The Relict Leopard Frog is under a Conservation Assessment and Strategy.

Amphibian species found at Pakoon Springs (Blomquist, S. et. al, August, 2003) during a survey for potential Relict Leopard Frog (*Rana onca)* habitat found Bullfrog (*Rana catesbeiana),* Woodhouse toad (*Bufo woodshousii)*, and Red-spotted toad (*Bufo punctatus)*.

During an inventory of Pakoon Springs in 2002 (Arizona Water Protection Fund Grant # 99-074), three species of wasps (*Parancistrocerus spp., Palmodes lissus, and Ammpphila spp*.), one species of dragon fly (*Erythemis simplicicollis*), one species of damsel fly (Zygoptera family),one species of mosquito (*Cules erytrhrothoras*), and one species of hover fly (Syrphidae family) were documented. None of which are listed.

During a recent spring inventory for the Monument (personal communication with Don Sada), Grand Wash Springsnails were discovered in the vicinity of Pakoon Springs.

3.3.4 Visual Quality

The project area contains the following classification of and objectives for visual resources:

> Class II: The objective for VRM Class II areas is to retain 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.

3.3.5 Recreation

Within the project vicinity, recreation setting attributes include geology, scenic view sheds, remoteness and a sense of solitude. General recreation activities include: driving for pleasure, exploring, hiking, photography, bird watching, and viewing nature and wildlife.

Motorized or mechanized vehicle, small aircraft, walking, or equestrian are typical modes of travel. OHVs are currently limited to existing roads and no known recreation trails are present. A short air strip, which is used occasionally, has been developed on a mesa adjacent to the proposed project area.

3.3.6 Wilderness Characteristics

> Arizona Strip BLM is in the process of revising the RMP. During the planning process, lands in the Pakoon Springs area were reported to possess wilderness character and were recommended for wilderness protection by the Arizona Wilderness Coalition. BLM assessed the recommended Pakoon Springs unit and did not identify any wilderness characteristics, especially in the highly modified Pakoon Springs Ranch area.

3.3.7 Burros and Trespass Cattle

The burro Herd Management Level in the proposed project area is set at zero (1998 RMP Amendment). However, burros continue to use the area, as they can freely roam from Nevada. Signs of burro use at Pakoon Springs have increased, and burros have been sighted near the springs, since the land was acquired by the BLM in 2002. Burros did not have access to the springs until 2002 therefore, they know of other sources of water.

The southern portion of the Pakoon Springs Allotment was closed to grazing March 15, 1999, by the 1998 RMP Amendment, however it was never fenced to exclude livestock. BLM acquired the grazing permit for the Pakoon Springs Allotment in 2002. From 2002 to early 2007 the Pakoon Springs Allotment was not grazed. However, the Allotment has since been re-configured with the Mosby Nay Allotment and grazed by the holder of the Mosby Nay Allotment grazing permit. A fence to prevent cattle from using the southern portion of the Pakoon Springs Allotment was to be constructed approximately one mile north of where the springs are located. From the Mosby Nay Permit Renewal EA AZ-130-2006-0036: "Implementation of this alternative would also require: Construction of approximately 4 miles of fence to restrict livestock access to the closed portion of the Mosby-Nay allotment." Although water was provided to this proposed new fence location in the Pakoon Springs Allotment, the fence was not constructed, due to lack of funds, prior to allowing cattle into the Allotment, and the cattle have been utilizing the spring area since March, 2007. Livestock have a newly developed water approximately one mile north of the springs.

For a more detailed description of the affected environment, refer to the Arizona Strip District RMP/EIS (1992a), the Grand Canyon-Parashant National Monument Proclamation (2000), and the Proposed Resource Management Plan/FEIS (2007).

4.0 ENVIRONMENTAL CONSEQUENCES – Alternative A, Proposed Action

4.0.1 Impact Type, Duration, and Magnitude

Type

Direct Impacts: Direct impacts are caused by an action and occur at the same time and same place as the action.

Indirect Impacts: Indirect impacts are caused by an action and occur later or not in the same location as the action, but are reasonably foreseeable.

Duration

Short Term Impacts: Less than five years
Long Term Impacts: > Five years

Magnitude

Negligible:	Not quantifiable, and therefore will not be analyzed.
Minor:	Changes would be measurable, although small, short-term, and local.
Moderate:	Changes would be measurable and would have appreciable impacts, although the effects would be local.
Major:	Major impacts are generally regional in nature, therefore no major impacts would occur.

4.1 Impacts to Critical Elements of the Human Environment: Alternative A

4.1.1 Cultural Resources:

Historic: Avoidance of the historic structure and rock walls would result in no adverse impact.

Pre-historic: Avoidance of the potentially eligible site (AZ A:9:163 (ASM)) and monitoring of any ground disturbing activities would result in no adverse impact.

Long-term, indirect: Development of interpretive resources would result in increased public knowledge and appreciated of the human history of the area. The impact would be positive and minor.

4.1.2 Threatened or Endangered Species

Mojave Desert Tortoise

Short and long-term, direct and indirect: Implementation of the Conservation Measures for the 1998 RMP Amendment would result in no impact.

4.1.3 Wetlands and Riparian Areas

Short-term, direct: In order to re-establish natural spring flow, the existing ponds, berms and irrigation facilities would be torn apart, recontoured and/or removed. The water would be channelized and the existing wetlands and riparian areas would not exist. The impact would be adverse and moderate.

Rotenone breaks down when exposed to sunlight and usually has a short lifetime (two weeks or less) in the environment. The impact would be adverse and minor.

Long-term, indirect: The wetlands and riparian areas would be sustainable, with only native species, and they would be in proper functioning condition. The impact would be positive and moderate.

4.1.4 Water Quality

Short-term, direct: The water quality would decrease, principally from sediment loads, as water courses are rebuilt. Rotenone is rapidly broken down in soil and water: its half-life in both is between one and three days. Nearly all its toxicity is lost in five to six days of spring sunlight, or two to three days of summer sunlight. It does not readily leach from soil and it is not expected to be a groundwater pollutant. The impact would be adverse and minor.

Long-term, indirect: The water quality is currently adequate to achieve the objectives of the proposed action. The water quality would be improved, as the wetlands and riparian areas would be in proper functioning condition. The impact would be positive and moderate.

4.2 Impacts to Resources: Alternative A

4.2.2 Monument Objects

Desert Tortoise (4.1.2 above)

Ecological diversity resulting from the junction of two physiographic ecoregions (the Basin & Range and the Colorado Plateau) and three floristic provinces (the Mojave Desert, Great Basin, and Colorado Plateau).

Short-term, direct: Existing non-native fauna would be removed. The impact would be positive and minor.

Long-term, direct: Native flora and fauna would be restored and ecological diversity would be improved. The impact would be positive and moderate.

4.2.2 Wildlife

Short-term, direct: Existing non-native fauna would be removed or greatly reduced, and the water from the spring sources would be channelized. Proper use of rotenone poses low risks to wildlife. The acute oral toxicity of rotenone is moderate for mammals, but there is a wide variation between species. Recent studies have shown that in rats, rotenone is more toxic for females than males. It is highly irritating to the skin in rabbits, and to the eyes. The LD50 for rats (the amount of the chemical lethal to one-half of experimental animals) is between 132 and 1,500 mg per kilogram. One factor in this wide variation may be the differences in the plant extracts used. The impact of project implementation would be adverse and minor.

Long-term, direct: Non-native fauna would be removed; and native flora and fauna, and their habitats, would be restored. The impact would be positive and minor.

4.2.3 Native and Non-native Aquatic Faunal Species

Short-term, direct: The impact to individuals of native species would be adverse and minor. If native endemic species are discovered, informed decisions would be made and actions would be taken to avoid extirpation.

Lon-term, direct: Impact to native species would be positive and moderate. Habitat conditions would be improved. If suitable habitat conditions for relict leopard frog are created during Phase V, and remain stable, the possibility of introducing the species would be evaluated.

4.2.4 Visual Resources

Short-term, direct: The impact would be adverse and moderate.

Management activities occurring during the initial phases of the project would result in a major modification of the existing landscape character. The level of change to the characteristic landscape would be high, due primarily to vegetation removal and soil disturbance.

Long-term, direct and indirect: The impact would be positive and minor.

With the long-term success of rehabilitating the site, visual contrasts, as viewed from the main road to the west, would be negligible. The VRM objectives would be met due to improved quality of visual resources as vegetative composition and structure become more visually diverse, and the native vegetation becomes more

vigorous. In the final phases of implementation, the major landscape contrasts would be reduced to minor contrasts.

4.2.5 Recreation

Short-term, direct: Because project implementation would initially require major modification of the existing character of the landscape, current dispersed and unstructured recreation opportunities in the area would be curtailed. The level of change to these opportunities would be minor.

Long-term, direct and indirect: The rehabilitated project area would enhance the condition of the local recreation settings. Providing modest, rustic visitor services in the form of interpretation and educational media about the historic human use and rehabilitation activities would contribute to visitors realizing several of the experiences and benefits targeted. The impact would be positive and moderate.

4.2.6 Wilderness Characteristics

Long-term, direct and indirect: The proposed action, if successful, may eventually contribute to restoring a degree of naturalness by improving and promoting the health of native flora and fauna at the spring sites. The proposed action would not preclude future management consideration of these areas for maintaining wilderness characteristics. The impact would be positive and minor to moderate.

4.2.7 Burros and Trespass Cattle

Short and Long-term, direct and indirect: No Impact.

4.3 Cumulative Impacts of the Proposed Action, Alternative A.

The rehabilitation and enhancement of the spring complex would provide for long-term, sustainable native biodiversity, ecological functions, and the pre-development riparian habitat characteristics of Pakoon Springs. The outdoor venue for natural and cultural resource education, spring restoration interpretation, and recreation on the Grand Canyon – Parashant National Monument would enhance visitor experience, provide for collaborative management and protection of the spring complex. The impacts would be positive, moderate, and long-term.

4.4 ENVIRONMENTAL CONSEQUENCES - Alternative B, No Action

The proposed action would not be implemented. Existing management and use of the project site would continue, subject to applicable statutes, regulations, policies and land use plan direction. This alternative does not meet the objectives stated in the 1992 RMP, nor the Proposed RMP (2007).

Short-term, direct: The ecological trend would continue along the current trajectory. Non-native species would continue to dominate the site. The impact would be adverse and moderate.

Long-term, direct: This alternative would not result in any ecological or social benefits. The impact would be adverse and moderate.

Impacts to Critical Elements of the Human Environment: Alternative B – No Action.

4.4.1 Cultural Resources:

Short and long-term, direct and indirect:

Historic: No impacts.

Pre-historic: No impacts.

4.4.2 Threatened or Endangered Species:

4.4.2.1 Mojave Desert Tortoise

Short and long-term, direct and indirect: No impacts.

4.4.3 Wetlands and Riparian Areas

Short-term, direct: Non-native fish, amphibians and plants will continue to thrive. Burros and trespass cattle would continue to use the area. The impact would be adverse and moderate.

Long-term, direct and indirect: The ponds would eventually become filled with cattails. The wetlands and riparian areas would not be in proper functioning condition. The impact is adverse and moderate.

4.4.4 Water Quality

Short- and long-term, direct and indirect: Burros and trespass cattle would continue to use the area. The impact would be adverse and moderate.

4.5 Impacts to Resources – Alternative B

4.5.1 Monument Objects

Ecological Diversity:

Short and Long-term, direct and indirect: Ecological diversity and proper functioning of riparian and wetlands conditions would continue to degrade. The impact would be adverse and moderate.

4.5.2 Wildlife

Short and Long-term, direct and indirect: The possibility to introduce relict leopard frogs would be lost. The impact would be adverse and moderate.

4.5.3 Native and Non-native Aquatic Faunal Species

Short- and long-term, direct and indirect. Non-native species would continue to persist and expand. There would be no potential for introduction of Relict Leopard Frog. The impact would be adverse and moderate

4.5.4 Visual Resources:

Short- and long-term, direct and indirect. Visual resources would be impacted by the use of burros and trespass cattle. The impact would be adverse and minor.

4.5.5 Recreation

Short and Long-term, direct and indirect: No impact

4.5.6 Wilderness Characteristics

Short and Long-term, direct and indirect: No impact

4.5.7 Burros and Trespass Cattle

Short and Long-term, direct and indirect: No impact.

4.6 Cumulative Impacts of No Action, Alternative B

Continued implementation of existing management and use of the project area would result in greater ecological degradation and lost opportunities for visitor use and education. Non-native, invasive species would thrive and expand. The potential to improve the population of relict leopard frogs would be foregone. The impacts would be adverse, moderate, and long-term.

5.0 CONSULTATION AND COORDINATION

5.1 Persons, Groups, & Agencies Consulted

The following agencies and groups have been consulted with, or provided recommendations to this EA:

Arizona Game and Fish Department
US Fish and Wildlife Service
US Bureau of Land Management
National Park Service
Grand Canyon Wildlands Council, Inc.
Geosciences Consulting
Otis Bay Consultants

5.2 List of Preparers

This EA was prepared by staff of the Grand Canyon - Parashant National Monument of the Bureau of Land Management, National Park Service, 345 E. Riverside Drive, St. George, Utah 84790, phone (435-688-3345) and Larry Stevens, R.J. Johnson, Otis Bay Consultants (Appendix B).

The following persons contributed to the development of this analysis:

Kathleen Harcksen, BLM	Team Lead, Writer/Editor: Vegetation, Wetlands/Riparian, Monument Objects, T&E Species, Desert Tortoise, Exotic Weeds, Burros, Trespass Cattle
Dave Van Alfin, BLM	Cultural Resources
Tom Folks, BLM	Recreation, Wilderness Characteristics, Visual Quality
Robert Smith, BLM	Soil, Water and Air
Kari Yanskey, NPS	Botany, Aquatic Species
Larry Stevens, GCWC	Ecology
R. J. Johnson, Geosciences	Hydrogeology
Otis Bay Consultants	Spring Restoration
Dennis Curtis, BLM	Monument Manager
Jeff Bradybaugh, NPS	Monument Superintendent

This EA was also reviewed by:

Robert Sandberg	Grazing Management

Tom Denniston, BLM	Wildlife
Laurie Ford, BLM	Lands and Realty
Linda Price, BLM	Standards for Rangeland Health
LD Walker, BLM	Noxious, exotic, invasive Weeds
Lee Hughes, BLM	Riparian
Gloria Benson, BLM	Native American Religious Concerns
Ron Wadsworth, BLM	Law Enforcement
Ray Klein, NPS	Law Enforcement

5.3 Summary of Public Participation

A Notice of Availability of the Environmental Assessment was sent to those on the Arizona Strip District Office NEPA mailing list, as well as to Jeff Jaeger, Research Assistant Professor, UNLV. The Environmental Assessment was also posted on the Arizona Strip Field Office BLM Internet Website.

5.3.1 List of Commenters

Jon C. Sjöberg, Supervising Biologist
Nevada Department of Wildlife

Andi S. Rogers, Habitat Specialist
Arizona Game and Fish Department

5.3.2 Comment Analysis

Generally, the comments regarding the proposed action were very encouraging, supportive, and provided information on techniques, funding and opportunities for cooperation between agencies.

5.3.3 Response to Public Comment

The concerns raised were addressed as follows:

"General Wildlife Management – drying of the area for wildlife use during construction"

Further evaluation of the larger pond has revealed that the spring sources of this pond produce over 100 gallons of water per minute. Although an attempt will be made to dewater the pond, it may not be feasible. Also, the water from this pond will be pumped to the agricultural fields below the pond, and will be available for wildlife use during the project construction and non-native bullfrog and mosquito fish removal phase. Following the construction phase, the water will be re-routed into the adjacent wash to the east, where it will also be available for wildlife use.

“Relict Leopard Frog Conservation – creating suitable habitat”

BLM is working with the Relict Leopard Frog Conservation Team, the Arizona Game and Fish Department (AGFD), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to implement the project in a manner that will result stable habitat, which will be evaluated for introduction of Relict Leopard Frog, Speckled Dace, and/or Grand Wash Spring Snails.

“Non-native Fish Management – protect native amphibians”

No native amphibians are present.

“Bullfrog Management – eradication is difficult”

The BLM understands the difficulty in eradicating bullfrogs. The BLM has and will seek advice from, and use the advice of experts. Also, the BLM will drain all of the ponds at the same time, so there will not be any possibility of re-colonization from adjacent ponds.

“Watchable Wildlife Potential – signage and educational materials”

In Phase VII of this EA, outreach and education are clearly identified as part of the Proposed Action. The Draft RMP identifies Pakoon Springs as a candidate to become a “Watchable Wildlife Area”. The BLM will work with AGFD to acquire Heritage dollars to help implement this phase of the proposed project.

Appendix A.

Project Area Map

Appendix B.

KEY PROJECT PERSONNEL

LARRY STEVENS

Dr. Stevens is an independent consulting ecologist and an adjunct faculty member of Prescott College and the Department of Biological Sciences at Northern Arizona University, as well as a research associate of the Museum of Northern Arizona. He consults with Grand Canyon Wildlands Council on scientific advisement, research and compilation. He received his undergraduate degree from Prescott College and his M.S. and Ph.D. from Northern Arizona University in Flagstaff, Arizona. He is an avid natural historian, and has spent the past 30 years engaged in ecological research on rivers in the American Southwest. His studies have focused on native and non-native plant-herbivore interactions in riparian habitats, as well as linkage between riparian and aquatic components of arid lands fluvial ecosystems, particularly the Colorado River in the Grand Canyon. Dr. Stevens coordinated and conducted research through the NAU Biology, Geology and Forestry departments, Arizona State University and the University.

R.J. JOHNSON

Mr. Johnson is a hydrogeologist and principal in-charge for Geosciences Consulting, a small independent hydrology, geology, and environmental consulting firm, based in Boulder City, Nevada. He earned his B.S. degree in geology from University of Nevada - Las Vegas and his M.S. degree in geology from Idaho State University in Pocatello, Idaho. He is a registered geologist in Arizona, California and Utah, a certified hydrogeologist in California, and a certified environmental manager in Nevada. Mr. Johnson has taught geology and environmental science as adjunct facility for the Community College of Southern Nevada and designs and leads UNLV extended education field classes with emphasis on geology and natural history of the southwest. Through his professional tenure his experience includes water resource management; ground-water exploration, research, and development; ground-water system and basin analysis; water-rights interpretations and filings; ground and surface-water, spring sampling, and inventory studies; hydrologic and geologic mapping; vadose zone monitoring and evaluation; drilling specification and contract preparation; and geochemical and stable isotope studies. A sample of spring related hydrologic projects with which Mr. Johnson has been involved include: inventory of 100 springs, seeps, and natural ponds on the Arizona Strip; spring inventory and hydrologic study of the Black Mountains area, Death Valley National Monument; spring, well, and water resources inventory and evaluation of the Warm Springs area, Moapa, Nevada.

OTIS BAY ECOLOGICAL CONSULTANTS

Otis Bay Ecological Consultants is a small ecological consulting firm that specializes in river restoration and enhancement, spring restoration and enhancement, and environmental studies, including physical (geology, geomorphology, hydraulic, and hydrology) and biological (birds, amphibians, small mammals, invertebrates, botanical, ecological) studies. Otis Bay is capable of completing quality projects that range from large scale river restoration to small wetlands and springs restoration. Otis Bay has substantial experience in ecosystem-based instream flow studies, restoration monitoring, and conservation planning for sensitive species.

Otis Bay provides a unique mix of biological, environmental, and physical sciences as they apply to ecosystem restoration, ecosystem protection, and sustainable environments. Its team of experts has proven experience working with sensitive species and their habitats and has a track record of restoration projects that have increased populations of target

species while enhancing the aesthetic values of the land and creating opportunities for outdoor human recreation.

KATHLEEN HARCKSEN

Ms. Harcksen is a natural resource manager for the Bureau of Land Management. She worked for 25 years as a Forester for the USDA Forest Service and is a Certified Silviculturist in Region 5 (California). For the first 15 years with the USFS, Ms. Harcksen was an interdisciplinary team lead and project manager; and oversaw the planning and implementation of timber sales. For the next 10 years she was the team lead, in the research branch of the Forest Service, and responsible for the planning, development and implementation of large-scale, interdisciplinary, cause and effect research. She facilitated the interdisciplinary team of scientists to develop and design the research projects. She was a liaison between the research and management branches of the Forest Service (National Forest System). She coordinated the development of the timber sale contracts to implement the research treatments, and monitored implementation to ensure research objectives were obtained. Currently Ms. Harcksen is the Project Manager for the Grand Canyon – Parashant National Monument. Ms. Harcksen earned here B.S. in natural resource management from the University of Nevada, Reno and her M.S. in applied forest ecology from Oregon State University, Corvallis.

FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD

Environmental Assessment AZ-130-2007-0048
Pakoon Springs Rehabilitation
Grand Canyon – Parashant National Monument/Arizona Strip District

Bureau of Land Management
345 East Riverside Drive
St. George, Utah 84790
435-688-3200

December 12, 2007

FONSI: Based on the analysis of potential environmental impacts contained in the attached environmental assessment (EA-AZ-130-2007-0048), and with due consideration of public response, the Bureau of Land Management (BLM) has determined that the proposed action will not have a significant effect on the human environment and an environmental impact statement is therefore not required.

Negative environmental impacts that could occur are negligible to minor in effect, and short in duration. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region.

There are no highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence identified. Implementation of the action would not violate any federal, state, or local environmental protection law. Therefore, in accordance with the National Environmental Policy Act of 1969, and regulations of the Council on Environmental Quality (40 CFR 1508.9), an environmental impact statement will not be prepared for this project.

DECISION: It is my decision to implement the Pakoon Springs Rehabilitation project on the BLM portion of the Grand Canyon – Parashant National Monument, as described in the Proposed Action, Alternative A. of EA-AZ-130-2007-0048. The Proposed Action would be an adaptive management project. Adaptive management is a formal, systematic, and rigorous approach to **learning from the results of management actions**, accommodating change, and improving management. Adaptive management consists of synthesizing existing knowledge, exploring alternative actions, and making explicit forecasts about their results. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying results. Actions and objectives are then adjusted based on this feedback and improved understanding to continue to try to achieve the Desired Resource Conditions. In addition, decisions, actions, and results are carefully documented and communicated to others, so that knowledge gained through experience is passed on, rather than lost when individuals move or leave the organization.

Although the pre-development condition of Pakoon Springs is unknown, the Desired Resource Condition for Pakoon Springs is a hillside seep and spring complex associated with a 5-10 acre Arizona Water Protection Fund (AWPF) Grant Contract pilot project. The outcome would be achieved through a phased approach that would allow management decisions to be made as the rehabilitation process progresses, and information is gained.

A hillside seep and spring complex consisting of hummocky, rolling topography from the uppermost ponds down slope through the agricultural fields nearest the ponds, would be rehabilitated. Removal of all berms and impoundments upstream from agricultural fields would be completed. An attempt to remove all non-native species would be made. Subsequent rehabilitation actions would be implemented in several phases that would expand to the total area restored, in a radiating manner, with the 5-10 acre AWPF pilot project located in the center.

Project personnel would receive a briefing on the goals and objectives of the treatment, and include information regarding protection of desert tortoise. The briefing would include information on employee and visitor safety.

Monitoring:

Implementation Monitoring would consist of:

a. Completion of BLM Pesticide Application Report within 24 hours of application,
b. Documentation of proposed pesticide treatments in the BLM MIS System at the beginning of each fiscal year, and
c. Documentation of pesticide treatment completion in the BLM MIS System at the end of each fiscal year.

Effectiveness Monitoring would consist of data gathered to help provide information to direct the rehabilitation, during implementation of Phase I - as well as from the following monitoring exercises:

Discharge, field water-chemistry, and air temperature at the major spring outflow points will be monitored quarterly for the first year and semi-annually for the following two years. One representative spring source water sample shall be collected for cation, anion and trace metal laboratory analysis. Photographs will be taken at the time of each site visit from reference points.

When restoration is complete, plant growth will be monitored, and the fencing maintained every other month during the growing season. Non-natives plants will be weeded during these visits.

RATIONALE for DECISION: The decision to authorize the proposed action has been made in consideration of the environmental impacts of implementation.

The action is in conformance with the Arizona Strip Resource Management Plan, 1992, as amended.

It is consistent with:

The Grand Canyon – Parashant National Monument Proclamation and Interim Management Policy, as well as with the Proposed BLM RMP.

The No Action Alternative was not selected because it is not in conformance with existing direction, and would not protect National Monument objects, wilderness character, and important ecological and social resources.

Alternatives Considered but not Analyzed in Detail

Enhancement of existing conditions and rehabilitation of 5-10 acres:
Enhancement of riparian vegetation community would be achieved primarily through completion of the 5-10 acre AWPF pilot project along with construction of protective fencing and cattle guard installation. No treatment or rehabilitation of former agricultural fields would occur. Limited modification of existing berms and impoundments would occur. Non-native vertebrates would not be removed.

This Alternative was not further analyzed, as it would not be in conformance with the 1992a RMP, Standard 3 for Rangeland Health, nor the Proposed RMP.

Rehabilitation of approximately 60-90 acres with construction of refugium habitat:
This alternative would result in creating the most extensive riparian community possible with existing water and maximize conservation potential of the site. A hillside seep and spring complex consisting of hummocky, rolling topography from the uppermost ponds down slope through Fields 1 and 2 would be constructed. This alternative would include the removal of all berms and impoundments upstream from Fields 1 and 2.

In addition to cuttings from local sources of cottonwood, Gooding's willow, *Baccharis*, mesquite, and jimmyweed, nursery stock would be used for revegetation in areas where an irrigation system is not required. Intensive efforts would be implemented to rid the area of non-native bullfrogs and mosquito fish. Refugium habitat would be created in line with the primary area of riparian community rehabilitation. Refugium habitat would consist of open channel and pool areas and would require the placement of large quantities of rock to form the channel and pool areas and placement of gravel for stream channel substrate, as well as consistent and intensive annual maintenance.

This alternative was not further analyzed, as it would require the creation of open water areas (streams and pools), and with proposed budgets this would not be economically feasible to implement, and especially not to maintain over the long term.

Public Review and Comments

This EA was posted on the Arizona BLM website and was made available for public and agency comment during a 30-day review period beginning November 2, 2007 and ending December 3, 2007. The Grand Canyon – Parashant National Monument sent a Notice of Availability to 119 federal and state agencies, individuals, businesses, grazing permittees, and organizations, notifying them of the availability of the EA and the methods of accessing the document. The announcement and document were published on the BLM Arizona Strip Field Office and Grand Canyon – Parashant National Monument websites. Individuals and organizations could request the environmental assessment in writing, by phone, or by e-mail.

Two comment letters, one from the Nevada Department of Wildlife, and one from the Arizona Game and Fish Department were received during the 30-day review period. Both agencies support the project. The AZGFD had a couple of concerns, which are addressed as follows:

"General Wildlife Management – drying of the area for wildlife use during construction"

Further evaluation of the larger pond has revealed that the spring sources of this pond produce over 100 gallons of water per minute. Although an attempt will be made to dewater the pond, it may not be feasible. Also, the water from this pond will be pumped to the agricultural fields below the pond, and will be available for wildlife use during the project construction and non-native bullfrog and mosquito fish removal phase. Following the construction phase, the water will be re-routed into the adjacent wash to the east, where it will also be available for wildlife use.

"Relict Leopard Frog Conservation – creating suitable habitat"

BLM is working with the Relict Leopard Frog Conservation Team, the Arizona Game and Fish Department (AGFD), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to implement the project in a manner that will result stable habitat, which will be evaluated for introduction of Relict Leopard Frog, Speckled Dace, and/or Grand Wash Spring Snails.

"Non-native Fish Management – protect native amphibians"

No native amphibians are present.

"Bullfrog Management – eradication is difficult"

The BLM understands the difficulty in eradicating bullfrogs. The BLM has and will seek advice from, and use the advice of experts. Also, the BLM will attempt to drain all of the ponds at the same time, so there will not be any possibility of re-colonization from adjacent ponds.

"Watchable Wildlife Potential – signage and educational materials"

In Phase VII of this EA, outreach and education are clearly identified as part of the Proposed Action. The Proposed RMP identifies Pakoon Springs as a candidate to become a "Watchable Wildlife Area". The BLM will work with AGFD to acquire Heritage dollars to help implement this phase of the proposed project.

BLM IMPLEMENTATION AND APPEAL

Within 30 days of receipt of the decision, an appeal may be filed with: Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203. A copy of the notice of appeal must also be filed in these offices: Grand Canyon – Parashant National Monument, 345 East Riverside Drive, St. George, Utah 84790; as well as with: Office of the Field Solicitor, U S Courthouse Suite 404, 401 West Washington Street SPC 44, Phoenix, AZ 85003-2151.

Approved: _____ _____

Dennis Curtis Date

Manager, Grand Canyon Parashant National Monument

UNITED STATES DEPARTMENT OF THE INTERIOR
GRAND CANYON-PARASHANT NATIONAL MONUMENT
345 East Riverside Drive
St. George, Utah 84790
Phone: (435) 688-3345 Fax: (435) 688-3388

December 12, 2007

Environmental Assessment AZ-130-2007-0048
Grand Canyon – Parashant National Monument – Pakoon Springs Rehabilitation

To: Andi S. Rogers
Habitat Specialist, Region II
Arizona Game and Fish Department
3500 S. Lake Mary Road
Flagstaff, AZ 86001

Dear Andi,

Thank you for your comments and input into the Grand Canyon – Parashant National Monument Pakoon Springs Rehabilitation Project and EA. Your comments are presented in *italic type*, while the BLM and NPS response is presented in **bold type**.

The Arizona Game and Fish Department (Department) has reviewed the request for public comment for the proposed Pakoon Springs Rehabilitation. We thank the Bureau of Land Management (BLM) for the opportunity to comment early in the process and we look forward to working with the BLM to restore this unique area to something more closely resembling a natural spring and seep system. In general, the Department is very much in support of this effort and appreciates the Adaptive Management approach to restoration. Below are some comments and concerns that we hope will aide in the rehabilitation of Pakoon Springs.

General Wildlife Management
Because this area is a rare oasis, several migrating and local wildlife such as those listed on page 18, likely rely on the water source both seasonally and year-round. Although it is my understanding that Luke Thompson has spoken with you related to the potential "drying" of the area, the current document still does not reflect our concerns that the area have some reliable water for wildlife during the restoration process. While we understand that complete drying-up is not likely, we would appreciate seeing our concerns reflected in the document to ensure that local and migrating species have available water.

Further evaluation of the larger pond has revealed that the spring sources of this pond produce over 100 gallons of water per minute. Although an attempt will be made to dewater the pond, it may not be feasible. Also, the water from this pond will be pumped to the agricultural fields below the pond, and will be available for wildlife use during the project construction and non-native bullfrog and mosquito fish removal phase. Following the construction phase, the water will be re-routed into the adjacent wash to the east, where it will be available for wildlife use.

Relict Leopard Frog Conservation
We strongly encourage the BLM to select an alternative that supports the Relict Leopard Frog Conservation Agreement and Strategy by ultimately creating habitat suitable for the establishment of relict leopard frogs (Rana onca) at Pakoon Springs. We realize that the BLM alone may not have the resources to do all that is necessary to make this site suitable, and encourage the BLM to seek the assistance of the Relict Leopard Frog Conservation Team, the Arizona Game and Fish Department and other resource agencies and experts.

BLM is working with the Relict Leopard Frog Conservation Team, the Arizona Game and Fish Department, Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to implement the project in a manner that will result stable habitat, which will be evaluated for introduction of Relict Leopard Frog, Speckled Dace, and/or Grand Wash Spring Snails.

Non-native Fish Management
Rotenone and other piscicides will kill larval amphibians (i.e., tadpoles). If the site contains any native amphibians (which is unlikely if bullfrogs are present), piscicide treatments should be planned to avoid times of the year when native larval amphibians are present.

No native amphibians are present.

Bullfrog Management
Eradication of this invasive species has proven extremely difficult in complex wetland habitats (e.g., San Bernardino National Wildlife Refuge in southern Arizona). If eradication is to be attempted, it will only be worthwhile if there is a substantial and long-term commitment of resources to an intensive effort. We encourage the BLM to partner with other agencies and organizations for funding and volunteer labor. If these efforts come to fruition, please keep us informed as we can increase awareness and generate interest in local wildlife groups in the Flagstaff area. We also encourage the BLM to consult with herpetologists Phil Rosen (Univ. of AZ) and Cecil Schwalbe (Univ. of AZ/USGS) who have considerable experience with bullfrog removal.

Based on their work in southern Arizona, Rosen and Schwalbe have recommended that bullfrog removal efforts include a combination of the following techniques over many years: a) trapping (hoop nets), spearing (gigging) and hand capture to remove a substantial fraction of adult frogs prior to the onset of egg-laying, and b) dipnetting and trapping to remove egg masses and larvae. In addition, if ponds are to be dried, they should first be encircled with drift fence. Pitfall and funnel traps should be placed along the inner perimeter of the fence to capture and remove bullfrogs and to prevent bullfrogs from emigrating to other ponds during the drying. The fence should be left in place to minimize recolonization of the site by bullfrogs from other ponds. Using these removal techniques, in combination with drift fencing, should make it possible to develop a rotating system where not all of the ponds are dried at the same time. In this way, water should still be available for other wildlife even while removal efforts are underway.

The BLM understands the difficulty in eradicating bullfrogs. The BLM has and will seek advice from, and use the advice of experts. Also, the BLM will attempt to drain all of the ponds at the same time, so there will not be any possibility of re-colonization from adjacent ponds.

Watchable Wildife Potential
Because the area is so rare and unique, the Department supports alternatives that include signage and educational materials. Due to its remoteness, high-density visitation seems unlikely, however those citizens that do venture to the area may enjoy a history of the area, details on restoration, and information on wildlife they may encounter. Every year the Department awards Heritage dollars to projects that relate to Environmental Education, as well as other categories, and we think that the

Pakoon rehabilitation may be a good match for these dollars. If you are interested, go to our website at http://www.azgfd.gov/w_c/heritage_program.shtml.

In Phase VII of this EA, outreach and education are clearly identified as part of the Proposed Action. The Draft RMP identifies Pakoon Springs as a candidate to become a "Watchable Wildlife Area". The BLM will work with AZGFD to acquire Heritage dollars to help implement this phase of the proposed project.

Thanks again for the opportunity to comment. Please contact Andi Rogers, Habitat Specialist, at (928) 214-1251 or arogers@azgfd.gov with any questions that you may have.

We appreciate these comments from the Arizona Game and Fish Department, regarding the Pakoon Springs Rehabilitation EA on for the Grand Canyon – Parashant National Monument (EA AZ-130-2007-0048). The comments will help us fine-tune field operational procedures. Regarding the EA, we believe your concerns are addressed therein, and we propose no changes. We greatly appreciate the AGFD interest in management of the Grand Canyon – Parashant National Monument.

Sincerely,

_____

Dennis Curtis,
Grand Canyon – Parashant Monument BLM Manager

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GRAND CANYON-PARASHANT NATIONAL MONUMENT
345 East Riverside Drive
St. George, Utah 84790
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In Reply Refer: Pakoon Springs Rehab (EA-AZ-130-2007-0048)

NOTICE OF DECISION
Grand Canyon – Parashant National Monument
PAKOON SPRINGS REHAB EA
December 12, 2007

Dear Interested Party:

Please be advised that an Environmental Assessment (EA-AZ-130-2007-0048) was prepared for the Grand Canyon – Parashant National Monument proposed Pakoon Springs Rehabilitation project. This EA was developed and reviewed through an interdisciplinary process; a Finding of No Significant Impact (FONSI) was made; and a Decision Record (DR) was signed. The EA, FONSI, and DR are public documents, and available upon request.

The Problem

Located in the Mojave Desert, Pakoon Springs is one of the few large springs on the Arizona Strip; it is the largest in the Grand Canyon-Parashant National Monument (GCPNM); and the most promising for restoration. For at least the last century, the Pakoon Springs have been developed and modified to provide water for livestock, agricultural irrigation, and domestic use. Many non-native plants and animals were introduced, including an alligator and bullfrogs.

The Solution

The Proposed Action would be an adaptive management project. Adaptive management is a formal, systematic, and rigorous approach to **learning from the results of management actions**, accommodating change, and improving management. Adaptive management consists of synthesizing existing knowledge, exploring alternative actions, and making explicit forecasts about their results. Management actions and monitoring programs are carefully designed to generate reliable feedback and clarify the reasons underlying results. Actions and objectives are then adjusted based on this feedback and improved understanding to continue to try to achieve the Desired Resource Conditions. In addition, decisions, actions, and results are carefully documented and communicated to others, so that knowledge gained through experience is passed on, rather than lost when individuals move or leave the organization.

Although the pre-development condition of Pakoon Springs is unknown, the Desired Resource Condition for Pakoon Springs is a hillside seep and spring complex associated

with a 5-10 acre Arizona Water Protection Fund (AWPF) Grant Contract pilot project. The outcome would be achieved through a phased approach that would allow management decisions to be made as the rehabilitation process progresses, and information is gained.

A hillside seep and spring complex consisting of hummocky, rolling topography from the uppermost ponds down slope through the agricultural fields nearest the ponds, would be rehabilitated. Removal of all berms and impoundments upstream from Fields 1 and 2 would be completed. An attempt to remove all non-native species would be made. Subsequent rehabilitation actions would be implemented in several phases that would expand to the total area restored, in a radiating manner, with the 5-10 acre AWPF pilot project located in the center.

Conformance with existing Direction

The Proposed Action is in conformance with the Arizona Strip Resource Management, 1992, as amended, and consistent with The Grand Canyon – Parashant National Monument Proclamation and Interim Management Policy.

The No Action Alternative was not selected because it is not in conformance with existing direction, and would not protect National Monument objects and important ecological and social resources.

BLM will continue to work with the Relict Leopard Frog Conservation Team, the Arizona Game and Fish Department, Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to implement the project in a manner that will result in stable habitat, which will be evaluated for introduction of Relict Leopard Frog, Speckled Dace, and/or Grand Wash Spring Snails.

Appeal Process

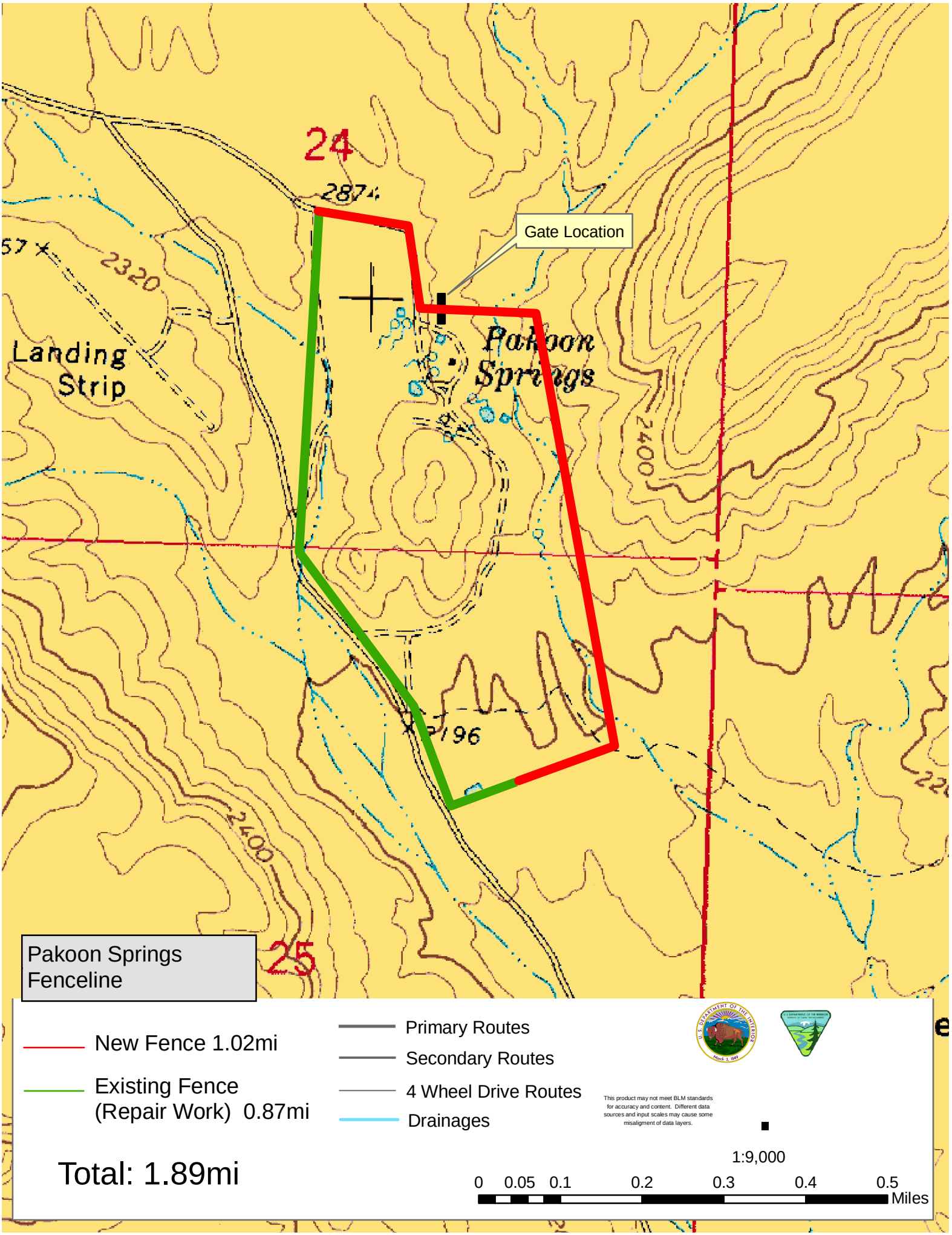
Within 30 days of receipt of this decision, an appeal may be filed with: Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203. A copy of the notice of appeal must also be filed in these offices: Grand Canyon – Parashant National Monument, 345 East Riverside Drive, St. George, Utah 84790; as well as with: Office of the Field Solicitor, U S Courthouse Suite 404, 401 West Washington Street SPC 44, Phoenix, AZ 85003-2151.

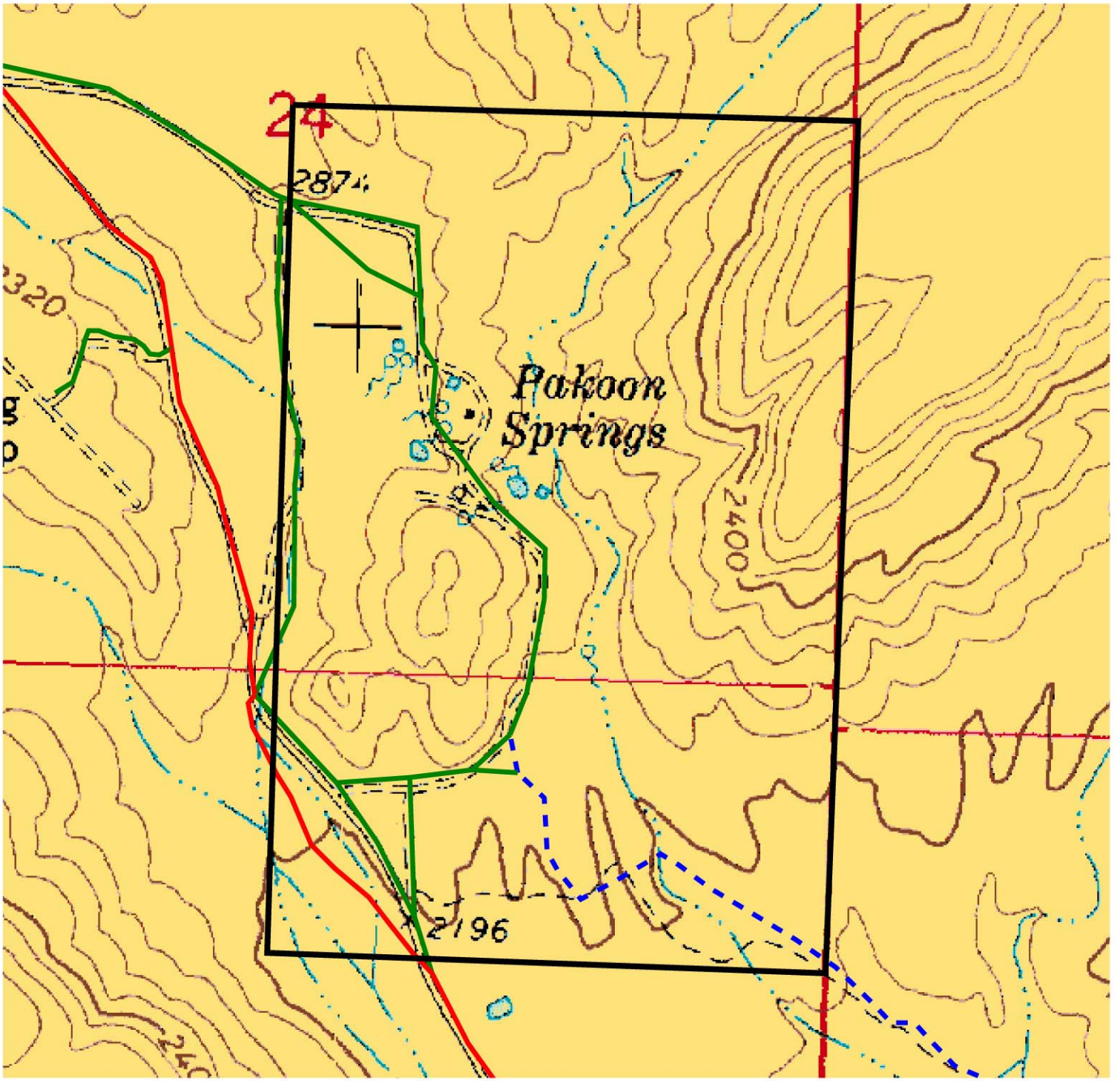
For more information or to request a copy of the EA and/or FONSI/DR, please contact Kathleen Harcksen at (435) 688-3380.

Sincerely,

_____

Dennis Curtis, Monument Manager


24
2874
Gate Location
Pakoon Springs
Landing Strip
2320
2400
2196
25
Pakoon Springs Fenceline
New Fence 1.02mi
Existing Fence (Repair Work) 0.87mi
Total: 1.89mi
Primary Routes
Secondary Routes
4 Wheel Drive Routes
Drainages
This product may not meet BLM standards for accuracy and content. Different data sources and input scales may cause some misaligment of data layers.
1:9,000
0 0.05 0.1 0.2 0.3 0.4 0.5
Miles

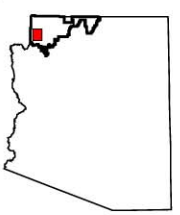


Pakoon Springs Clean-up
CX-AZ-130-2005-0014

T. 35 N., R. 16 W., SE ¼, Section 24,
T. 35 N., R. 16 W., N ½ of the NE ¼, Section 25
Gila and Salt River Meridian

- Pakoon Ranch
- Primary Road Unpaved
- Secondary Road Unpaved
- Tertiary Road Unpaved
- Single Track

N
W E
S



0 0.5 Miles

Map produced by
Arizona Strip Field Office Staff
6 January 2005