



## United States Department of the Interior

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**In reply refer to:**

AESO/SE

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AESO/SE

02EAAZ00-2019-F-0122

June 7, 2019

Memorandum

To: Jayme Lopez, Field Manager, Gila District Office, Bureau of Land Management, Tucson, Arizona

From: Jeffrey L. Humphrey, Field Supervisor

Subject: Biological Opinion for San Pedro Riparian National Conservation Resource Management Plan, Cochise County, Arizona

Thank you for your request for formal consultation and conference with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). Your request was dated February 12, 2019, and received by us on February 25, 2018. At issue are impacts that may result from the proposed San Pedro Riparian National Conservation Resource Management Plan located in Cochise County, Arizona. The proposed action may affect and is likely to adversely affect the following endangered species: 1) Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) and its designated critical habitat; 2) desert pupfish (*Cyprinodon macularius*); 3) Gila topminnow (*Poeciliopsis occidentalis*); 4) southwestern willow flycatcher (*Empidonax traillii extimus*); and 5) ocelot (*Leopardus pardalis*); as well as the following threatened species: 1) northern Mexican gartersnake (*Thamnophis eques megalops*); and 2) yellow-billed cuckoo (*Coccyzus americanus*).

In your memorandum, you requested our concurrence that the proposed action is not likely to adversely affect the endangered jaguar (*Panthera onca*). We concur with your determination and include our rationale in Appendix A.

You also determined that the action would have “no effect” on the Mexican spotted owl (*Strix occidentalis lucida*) and northern aplomado falcon (*Falco femoralis septentrionalis*), as well as critical habitat for the following species: jaguar, Chiricahua leopard frog, and southwestern willow flycatcher, as they do not occur in the project area. “No effect” determinations do not require our review and are not addressed further. Per our discussions, we jointly determined that the proposed action would not adversely modify or destroy proposed critical habitat for the

yellow-billed cuckoo or northern Mexican gartersnake. Therefore, effects to these proposed critical habitats are not addressed in this biological opinion, but will be addressed once critical habitat designations are finalized for these species.

This biological opinion and conference opinion is based on information provided in the May 2019 Biological Assessment for the Proposed Resource Management Plan for the San Pedro Riparian National Conservation Area (2019 BA or BLM 2019), as well as email correspondence between our agencies and other sources of information. Literature cited in this biological and conference opinion is not a complete bibliography of all literature available on the species of concern, resource management activities and their effects, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

This biological opinion does not address previous BLM actions in the action area for which consultation has already occurred, but incorporates them by reference where appropriate. A complete list of previous consultations is found in Table 2 of the 2019 BA and below.

### **Consultation History**

- October 24, 2018: we received your draft Biological Assessment and request for formal consultation.
- November 27-December 19, 2018: we spoke with and met with your staff numerous times to discuss and resolve issues related to the draft BA.
- December 22, 2018 through January 26, 2019: Federal government lapse in funding and Federal employees furloughed.
- February 25, 2019: we received your Biological Assessment and request for formal consultation.
- April 10-17, 2019: we spoke with your staff numerous times to discuss and resolve additional issues related to the BA, and were informed of changes to the proposed action.
- May 1, 2019: we received your Revised Biological Assessment including changes to the proposed action.
- May 3-7, 2019: we spoke with your staff to discuss and resolve ongoing issues related to the revised BA.
- May 9, 2019: we received a newly Revised Biological Assessment reflecting changes from the draft Resource Management Plan to the Proposed Resource Management Plan and initiated consultation.
- May 10-14, 2019: we spoke with your staff to discuss and resolve ongoing issues related to the revised BA.
- May 22, 2019: we received a Final Revised Biological Assessment.
- May 24, 2019: we sent you the draft biological opinion.
- June 3, 2019: we received your comments on the draft biological opinion.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

A complete description of the proposed action is found in the May 2019 Biological Assessment for the Proposed Resource Management Plan (RMP) for the San Pedro Riparian National Conservation Area (SPRNCA) and is summarized below. The RMP describes planning-level decisions and these decisions (e.g., goals and objectives, land use allocation decisions, and all special designations) become effective on approval of the record of decision. Management actions that necessitate more site-specific project planning require further environmental analysis; decisions to implement site-specific projects are subject to administrative and environmental review when such decisions are made. Implementation of all actions and decisions in the RMP is subject to available funding and staffing.

The proposed action includes 1) goals, which are broad statements that describe desired outcomes that are usually not quantifiable; 2) objectives, which identify specific desired outcomes and are usually measurable and may have an established time frame for achievement; 3) allocations and allowable uses, which are decisions that describe geographic areas for specific resources or uses; and 4) management actions, which are actions anticipated to achieve desired future conditions, goals, and objectives. Below, “Management Actions and Allowable Uses” and “Land Use Allocations” from the May 2019 Biological Assessment are included, and in some cases, summarized or shortened (particularly when they are not anticipated to affect listed species and critical habitat), below. Other aspects of the proposed action (e.g., goals, objectives) can be found in the May 2019 Biological Assessment.

#### **Air Quality**

1. When implementing BLM or BLM-approved activities, minimize surface disturbances to prevent the addition of large quantities of dust to the air; apply stipulations to mitigate the impacts on air quality.
2. If any or all of the SPRNCA is designated as a nonattainment area for violations of the National Ambient Air Quality Standards (NAAQS), work with regulatory agencies to follow the State Implementation Plan (SIP) for reducing air pollutants in the area.

#### **Soil and Watershed Management**

1. Use a broad array of management tools and structures to control sheet, rill, and gully erosion in areas indicating accelerated erosion from lack of vegetation cover and soil erosivity.
2. Seed and plant using only native seeds and plants, if needed, following fire, flood, or other disturbance.
3. Improve watershed health and prioritize treatments for recharge enhancements in ephemeral tributaries (refer to Appendices G and I of the EIS); monitor groundwater levels in monitoring wells near recharge enhancement projects, if there are no increases in groundwater levels, then implement recharge enhancement projects that are larger in scale, are closer to the river, or are a different type of recharge enhancement.
4. Enhance riverine geomorphology and bank recharge to protect base flow through low impact structural and nonstructural approaches where needed in San Pedro River

segments (refer to Appendices G and I of the EIS); implement small structures and monitor channel slope, sinuosity, soil moisture, groundwater levels near treatments, and vegetation cover.

5. Assess the human-made structures from historical land uses, such as agricultural dikes and berms, railroad grades, and ditches and diversions, for hydrologic function. determine their level of impairment and either dismantle or alter them, as necessary
6. Modify all routes affecting watershed health and function as necessary to restore watershed function and long-term health (see Section 3.2.3 of the EIS).

### **Water Management**

1. Review and assess water needs for resources managed on the SPRNCA and acquire and perfect new water rights as deemed necessary for management.
2. Design any pumping of groundwater for BLM-authorized actions to reduce impacts on base flows, such as putting floats in troughs and seasonally restricting groundwater pumping.
3. Do not approve land use authorizations (realty actions) involving additional groundwater pumping on the SPRNCA, subject to valid existing rights.
4. Assess existing wells on the SPRNCA for use as monitoring wells, administrative use, wildlife use (drinking and habitat), habitat restoration (for maintaining a limited number of off-channel aquatic habitats for threatened and endangered species recovery), livestock use, emergency habitat augmentation, and other potential uses.

#### *Recharge Enhancement Projects Reasonably Foreseeable Development Scenario*

The potential project size was determined based on soil types that had the highest potential for infiltration. There is anticipated to be 2,170 acres of recharge enhancement projects.

#### *Removal of Human-Made Structures Reasonably Foreseeable Development Scenario*

The potential acreage was determined based on existing locations of human-made structures and stream channel condition. It is anticipated that there will be 50 acres of human-made structures to be removed.

#### *Long-Term Disturbance Reasonably Foreseeable Development Scenario*

Campgrounds, recreation sites, planned trails, and livestock facilities together represent the reasonably foreseeable development (RFD) long-term, surface disturbance areas estimated at 12 acres.

### **Vegetation Management: All Vegetation Communities**

1. Use combinations of biological (targeted livestock grazing, insects, etc.), mechanical, prescribed fire, and chemical management to suppress, control, and/or eliminate invasive species/noxious weeds.
2. Use native trees, shrubs, and herbs and native seed mixes for restoration.
3. Use biological (including targeted livestock grazing) chemical, mechanical, and prescribed fire treatment methods to create and maintain firebreaks to reduce fuel characteristics.
4. After a vegetation/restoration treatment, exclude livestock from the treatment area for two growing seasons or until resource objectives are met.

5. Apply the following criteria for plant collection in all vegetation communities:
  - Collection of living or dead native plant material for commercial uses will be prohibited.
  - Collection of living or dead native vegetation and byproducts that are proposed for federal listing, federally listed as threatened or endangered species, or highly safeguarded native plants identified in the Arizona Native Plant Law will be prohibited, except as permitted by the USFWS.
  - Collection of live vegetation or vegetation products will be allowed for scientific uses (except where stated above), when covered by an approved BLM research permit.
  - Reasonable amounts of wood and other plant materials may be used for administrative purposes.
  - Collection of living native vegetation and seeds for restoration or to establish new populations of rare or federally listed plants will require BLM authorization.
  - Collection of plants for noncommercial, personal use quantities of herbals, medicines, and traditional use items by Native American tribes will be allowed in areas identified in coordination with Native American tribes.
6. Allow gathering of dead and down wood for campfires.
7. Allow for biomass use usable wood products generated during restoration treatments to be collected by the public with a permit.
8. Allow for the use of any wood from vegetation treatments for on-site erosion control, such as Zeedyke structures in damaged watercourses, or chips for soil improvements designed to add organic material, hold more water, and slow erosion.

#### *Vegetation Treatment Reasonably Foreseeable Development Scenario*

The vegetation treatment RFD scenario is based on the vegetation communities that are currently departed from the historic climax plant community (HCPC). This information is derived from fieldwork conducted by the Natural Resources Conservation Service (NRCS) in the ecological site inventory. The inventory took data on what key plant species are on an ecological site. The BLM then compared that data to what key plant species should be on the ecological site and determined how far departed the vegetation community was from the HCPC. The BLM looked at the state and transition models to determine what method would have the highest likelihood of success for returning the departed community back to HCPC. The vegetation treatment RFD scenario is based on sites that are departed from the HCPC and the use of the appropriate tool to return that community to HCPC. Treatments in the action alternatives will further SPRNCA legislative guidance to enhance conservation values and achieve the objectives of this plan.

The treatment estimates of acreage for vegetation are as follows: prescribed fire 17,070; mechanical 6,130; herbicide 11,040. The total acreage to be treated is estimated to be 27,460 acres, which includes private and State-administered land on the SPRNCA; the BLM foresees working with them as partners on vegetation treatments. The BLM foresees multiple vegetation treatments in the same locations, that is, overlapping treatments, thus the total for individual treatment by type is greater than 27,460.

#### **Vegetation Management: Riparian Vegetation Communities**

1. Restore and maintain riparian function.

2. Allow for herbicide and mechanical vegetation treatments to meet riparian vegetation objectives.
3. Use a broad array of management tools to remove salt cedar and maintain past salt cedar treatments.
4. Authorize no livestock use (see Figures 4 and 2-17 and Section 3.3.1 of the EIS) until fencing or other control methods are in place to prevent livestock access to riparian areas. (Livestock grazing will continue to occur in the riparian pasture along the Babocomari River.) Authorize no livestock use (see Figures 2-16 and 2-17, Appendix A, and Section 3.3.1 of the EIS) until fencing or other control methods are in place to prevent livestock access to riparian areas.
5. Design new recreation developments to minimize impacts on riparian vegetation and critical habitat.
6. Monitor and maintain existing recreation trails on upper banks and floodplains; limit spur trails to channel edges to short segments.

#### **Vegetation Management: Wetland Vegetation Communities**

1. Protect sensitive riparian and wetland ecological sites and surrounding areas that support rare or special status plant species from activities that disrupt key ecological processes (e.g., ecological site stability, erosion, deposition, or recharge potential) through restricted use, or mitigate using erosion prevention structures, such as signs, fencing, cross logs, proper trail drainage, or other stabilization methods.
2. To enhance or create fish and wildlife habitat, use prescribed fire and mechanical methods to maintain and restore wetland function; continue to create wetlands where natural or adequate artesian water sources have already been developed (Dunlavy [3], Kolbe, and White House artesian wells and the St. David Ciénega).
3. Use soft structures created with wood, tree plantings, and hand-placed rocks to direct flood energy to enhance Murray Springs; heavy equipment may be used for excavation.
4. Install bullfrog-proof fencing around perimeter of restored and artificial wetland ponds: Dunlavy, Kolbe, Flowing Well, and Curtis Well.
5. Manage development of off-channel wetlands through natural processes.
6. Continue to manage vegetation in the wetland at Little Joe Spring for recovery of federally listed aquatic species.

#### **Vegetation Management: Sandy Washes (Xeric Riparian)**

1. Assess the xeric-riparian areas for barriers to wildlife movement and, if necessary, implement measures to facilitate and restore wildlife movement.

#### **Vegetation Management: Upland Vegetation Communities (Chihuahuan Desert Scrub and Grasslands)**

1. Allow for mechanical, chemical, prescribed fire, and biological (including targeted livestock grazing) vegetation treatments to restore or enhance priority species habitat conditions in semidesert grasslands; use prescribed fire to inhibit the invasion of woody plants.
2. Assess the need for restoring abandoned farm fields; restore them using native plantings, seeding, heavy equipment, herbicide, and prescribed fire.

### **Fish, Wildlife, and Special Status Species**

1. Reintroduce, transplant, and augment fish and wildlife populations, in collaboration with the Arizona Game and Fish Department (AZGFD) or the USFWS, for the following purposes:
  - To maintain or increase populations, distributions, and genetic diversity;
  - To conserve or recover threatened or endangered species;
  - To restore or enhance native wildlife species diversity and distribution.
2. Species that may be reintroduced, transplanted, or augmented are as follows:
  - Fish—Gila topminnow, desert pupfish, spokedace, loach minnow, roundtail chub, Gila chub, razorback sucker, or any of the other 13 species found in the system historically and based on changes in habitat suitability over time.
  - Reptiles and amphibians—Chiricahua leopard frog, Arizona tree frog, northern Mexican garter snake, and lowland leopard frog.
  - Birds—Gould’s Turkey, burrowing owl, and aplomado falcon.
  - Mammals—Beaver, mule deer, and pronghorn antelope.
  - Plants—Huachuca water umbel, Canelo Hills ladies’-tresses, Wright’s marsh thistle, Arizona giant sedge, and Arizona eryngo.
3. Identify and protect springs and associated indigenous riparian vegetation for wildlife water, cover, and forage.
4. Allow the use of mechanical and chemical fishery renovation techniques to control nonnative species.
5. Identify potential or suitable habitat for special status species on the SPRNCA.
6. Restore habitat with the potential to reach suitability for special status species on the SPRNCA.
7. Huachuca water umbel: Manage the designated critical habitat (approximately 33.7 miles see Figure 3-5 of the EIS) to preserve existing occurrences and its seed banks and to protect occupied habitat, unoccupied corridors, and habitat quality.
8. Huachuca water umbel: Remove stressors, such as trampling and invasive, nonnative plant competition.
9. Huachuca water umbel: Evaluate unoccupied areas on the SPRNCA for suitability to establish new populations to help ensure long-term survival.
10. Establish refugia habitats through restoration or enhancement within ciénegas and wetlands for priority species.

### *Land Use Allocations*

1. Establish the following priority habitats and species (see Figure 7 of the 2019 BA); those listed under each priority habitat type are indicator species for that habitat (species’ scientific names are in Appendix J of the EIS).

### Riparian Areas and Wetlands Priority Species and Habitats:

#### Cottonwood-willow riparian forest

- Yellow-billed cuckoo; Southwestern willow flycatcher; Gray hawk

#### Mesquite forest (bosque)

- Yellow-billed cuckoo; Gray hawk; Arizona Bell's vireo, Yellow warbler

#### Big sacaton grassland

- Arizona Botteri's sparrow; Collared peccary

#### Wetlands (interior marshland [ciénega], wetlands [other than ciénega], aquatic [open water])

- Huachuca water umbel; Canelo Hills ladies'-tresses; Arizona eryngo; Northern Mexican garter snake; Gila topminnow; Desert pupfish; Spikedace; Loach minnow; Roundtail chub; Gila chub; Razorback sucker; Arizona tree frog; Lowland leopard frog; Longfin dace; Desert sucker; Beaver; Chiricahua leopard frog; Common yellowthroat

#### Desert Washes Priority Species and Habitats:

##### Sandy Wash (Xeric-riparian)

- Gambel's quail

#### Uplands Priority Species and Habitats:

##### Semidesert Grassland

- Grassland birds (Botteri's sparrow)

##### Chihuahuan Desert scrub

- Mule deer; Lesser long-nosed bats

### **Wildland Fire and Management**

1. The fire management program will manage all fires in accordance with resource management objectives established in this RMP, based on current conditions and fire location. Firefighter and public safety is the first priority in all fire management and suppression. A response can vary from aggressive, initial, and direct action to indirect actions, based on firefighter and public safety. Tailor strategies and tactics to address areas of resource concerns.
2. Investigate human-caused wildfires in accordance with BLM policy.
3. Develop an active fire prevention and mitigation program and conduct public education and outreach, such as through Firewise USA®.
4. Manage no acreage to protect wilderness characteristics.
5. Implement appropriate emergency stabilization and rehabilitation (ESR) actions following a wildfire; use ESR to prevent further and unacceptable resource damage from wildland fire.
6. Implement post-ESR rehabilitation and restoration using mechanical, chemical, erosion control, native seeding, and native planting treatments.

#### *Land Use Allocations*

1. The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions (see Figures 9 and 10 of the BA).

### **Cultural Resources**

1. Provide opportunities for and permit scientific research by qualified professionals at sites allocated for scientific use; prioritize support for research projects that target key data gaps.
2. Stabilize and rehabilitate the following sites to preserve cultural values: Presidio of Santa Cruz de Terrenate, Fairbank Townsite and Cemetery (and the greater Fairbank area



beyond the Historic Townsite) Charleston, Brunckow Cabin, Contention, Grand Central Mill, Sunset Mill, Boquillas Ranch Headquarters, and the San Pedro Ranch House.

3. At management's discretion, nominate historic properties to the National Register of Historic Places and assess historic structures for placement onto a priority heritage asset list.
4. Do not manage, expand, or designate any existing or new area of critical environmental concern (ACEC) to protect significant historic or cultural values.
5. Prepare a comprehensive Class I overview and updated cultural context for the entire SPRNCA planning area.
6. Identify data gaps to prioritize Class III inventory or scientific investigation of areas known or likely to contain unique or threatened cultural resource types, such as rock art and Archaic, Sobaipuri, and Apachean sites.

#### *Land Use Allocations*

1. Allocate the Diack, Murray Springs Clovis Site, and Lehner Mammoth-Kill Site for scientific use, and monitor and manage them accordingly.
2. Continue to manage the following 11 sites for scientific use: AZ EE:4:3(ASM), AZ EE:8:1(ASM), AZ EE:8:5(ASM), AZ EE:8:7(ASM), AZ EE:8:34(ASM), AZ EE:8:48(ASM), AZ EE:8:4(AMF), Benson 8:3 (GP), AZ EE:8:283(ASM)/SPII-10, SPII-16, and SPII-20.
3. As identified and evaluated, allocate Archaic, Sobaipuri, Apachean, and rock art sites across the SPRNCA for scientific use, and monitor and manage accordingly.
4. Allocate the Fairbank Cemetery (in combination with the Fairbank Historic Townsite), Grand Central Mill Site, Contention City, and Clanton Ranch for public use, and manage and monitor them accordingly.
5. N/A.
6. Continue to manage the following 10 sites for public use: Presidio of Santa Cruz de Terrenate, Fairbank (Historic Townsite), Murray Springs Clovis Site, Lehner Mammoth-Kill Site, Charleston, Millville (Gird and Corbin Mills), the Boquillas Ranch Headquarters (a.k.a. Little Boquillas), Brunckow Cabin, the San Pedro Ranch House, and Gaybanipitea.
7. Allocate the Charleston and Millville rock art sites and sites with "isolated" adobe or masonry walls to experimental use.
8. Allocate a representative sample of cultural site types to conservation for future use, and manage and monitor them accordingly; allocated sites should represent the range of variability among cultural and temporal contexts, as identified by an updated cultural history for the SPRNCA.
9. Evaluate and revise allocations as appropriate, when circumstances change or new data become available; use the following criteria to determine when allocations should be evaluated and revised:
  - Modification to SPRNCA legislation, or some other unforeseen legislation, requires a different management approach.
  - The BLM determines that a previous allocation is resulting in adverse effects on or undue degradation of a resource.
  - The BLM determines that a previous allocation hinders its ability to meet other resource management goals.

- Previous allocation is no longer applicable or appropriate, such as a site allocated to conservation for future use is now able to be studied because of new technology, so the site will be allocated to scientific use instead; or a site allocated to scientific use will be allocated to public use because, based on the research results, the BLM can now develop the site as a public interpretive site.
10. Discharge sites from management after successfully completing documentation and assessment, and in consultation with the State Historic Preservation Office, Native American tribes, and other affected or interested parties.

### **Native American Concerns**

1. Allocate TCPs and sacred sites for traditional use.
2. Facilitate traditional use access for Native Americans with cultural and historic ties to the SPRNCA.
3. Prepare comprehensive ethnographic or ethno-ecological studies in coordination with interested Native American tribes with cultural and historic ties to the SPRNCA.

### **Visual Resources**

1. Prioritize for rehabilitation areas that are visible in the foreground from the local public highways (State Routes 82, 90, and 92, Charleston Road, and other sightseeing routes), from the San Pedro Trail system and those visible from designated public use areas (see Figures 11 and 12 in the BA).
2. Allowable land use activities that require landscape modifications to achieve other resource management objectives will be subject to design features and mitigation measures, to be consistent with the applicable VRM class objective.

### *Land Use Allocations*

1. The following VRM classes will be designated (Figures 13 and 14 in the BA):
  - Class I—0 acres; 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 prevent limited management activity. The level of change to the characteristic landscape should be low and must not attract attention.
  - Class II—27,850 acres; 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 III—28,140 acres; 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 IV—0 acres; the objective of this class is to provide for management activities that require major modifications of the landscape character. 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, attempts should be

made to minimize the impact of these activities through careful location, minimal disturbance, and basic element repetition.

### **Paleontological Resources**

1. Manage the Diack, Horsethief, Murray Springs Clovis Site, and Lehner Mammoth-Kill sites for scientific research; allow research in accordance with BLM permitting procedures.
2. Close Murray Springs and Lehner to BLM-permitted ground-disturbing activities.
3. Manage the Murray Springs Clovis Site and Lehner Mammoth-Kill Site for public visitation; monitor and protect the sites managed for public visitation, using actions described in detail below; evaluate and manage additional paleontological sites for public visitation, based on their significance and preservation value.
4. As funds are available, inventory future land acquisitions for paleontological resources, classify them using the potential fossil yield classification (PFYC), and allocate them, as appropriate.
5. Before any ground-disturbing activities take place in PFYC Class 3, 4, and 5 areas, a qualified BLM staff member must search records and perform a paleontological survey; alternatively, this will be performed by a consulting paleontologist holding a valid BLM paleontological resources use permit, per BLM Manual 8270—General Procedural Guidance for Paleontological Resource Management (BLM 1998 as cited in the BA). After the initial survey, if fossil localities are discovered, the BLM or a BLM-permitted paleontologist will be required to monitor them to avoid or minimize impacts during ground-disturbing activities.
6. Collecting any vertebrate fossils and invertebrate and plant fossils for scientific research will require BLM authorization.
7. Casual collection of paleontological resources will be prohibited.

### *Land Use Allocations*

1. Classify the SPRNCA according to its potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils using the PFYC system. In this system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils, with a higher class number to indicate a higher potential. The PFYC classes and associated acres (Figure 15 of the BA) are as follows:
  - Class 1 (low sensitivity)—2,070 acres, geologic units that are igneous or metamorphic, excluding air-fall and reworked volcanic ash units; geologic units are Precambrian in age; management concern for paleontological resources is usually negligible or not applicable.
  - Class 2 (low sensitivity)—21,100 acres; geologic units that are not likely to contain paleontological resources.
  - Class 3 (moderate sensitivity)—0 acres (currently), sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence.
  - Class 4 (high sensitivity)—11,440 acres, geologic units that are known to contain a high occurrence of paleontological resources.
  - Class 5 (high sensitivity)—0 acres (currently), highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources.

- Class U (Unknown)—21,380 acres, geologic units that cannot receive an informed PFYC assignment.

### **Livestock Grazing**

1. The Arizona Standards for Rangeland Health will continue, with established schedules and congressional requirements. The Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (BLM 1997) will apply to all livestock grazing on BLM-administered lands, consistent with the appropriate enabling legislation. The BLM interdisciplinary land health allotment evaluation process will continue to be used to provide specific guidance and actions for managing livestock grazing. Existing or new allotment management plans and other activity plans will be consistent with achieving the desired future conditions (HCPC), based on ecological site guides provided by the NRCS and Standards for Rangeland Health. They will contain the site-specific management objectives, as well as actions, methods, tools, and appropriate monitoring protocols.
2. Any changes to the existing grazing leases will be based on activity-level planning.
3. Complete land health evaluations before issuing new leases with terms and conditions designed to achieve allotment specific objectives.
4. Develop allotment-specific objectives during implementation-level planning. This will ensure management of livestock will meet the enabling legislation.
5. Install, as needed, additional range improvements.
6. Establish an adaptive management process on the SPRNCA to annually evaluate monitoring data and issues related to livestock grazing, with a primary goal of maintaining and achieving RMP goals and objectives.
7. Do not authorize livestock crossing permits through the riparian area on the SPRNCA.
8. Evaluate and modify fences as needed to restrict vehicle access or to allow safe passage by dispersed recreationist (hunters, hikers, and equestrians) or to safely accommodate wildlife movement.
9. Exclude livestock from the developed public use areas and sites to protect the setting quality and to avoid conflicts with grazing operations and use.
10. All new livestock waters will be enclosed tanks, except where another type of water development would maximize benefits and minimize impacts on wildlife and special status species. Maintain existing livestock waters as enclosed tanks.
11. Should a livestock grazing lease be relinquished, evaluate the allotment and associated resources and other resources and public uses to determine the appropriate allocation of available forage.

### *Land Use Allocations*

- Previous acres open: 7,030 acres
- Open: 7,030 acres
- Closed: 48,960 acres
- Total: 7,030 acres
- Existing animal unit months (AUMs): 592
- Removed AUMs: 0
- Additional AUMs: 0
- Total AUMs: 592

1. Livestock grazing will continue on the 7,030-acre area in accordance with the State exchange agreements. The remainder of the SPRNCA (48,960 acres) will be closed to grazing (see Figure 5 of the BA).
2. Land not available for livestock use will remain unallocated.

*Livestock Grazing Infrastructure Reasonably Foreseeable Development Scenario*

The livestock grazing scenario assumes 592 AUMs will continue to be available for livestock grazing.

**Recreation**

1. Length of stay—Persons may occupy any specific location in developed campgrounds or on public lands for no more than 7 days in any period of 21 consecutive days, unless otherwise authorized.
2. Campgrounds could be developed.
3. Dispersed camping will not be allowed within a half-mile of public access points or where otherwise prohibited.
4. Camping will not be allowed at sensitive sites and areas developed for other purposes, such as trailheads, interpretive or educational sites, visitor contact, and administrative facilities.
5. Overnight parking at trailheads and access points will be allowed for vehicles belonging to primitive and backcountry campers.
6. There are no existing or new ACECs designated under this alternative.
7. Pets, including hunting dogs, must be leashed at all developed facilities and in other posted areas, in accordance with 43 CFR 8360.
8. Hunting dogs may be used for hunting, according to AZGFD regulations.
9. Campfires will be allowed in designated areas within fire rings provided for that purpose, subject to seasonal fire restrictions.
10. Woodcutting (including for campfires) will continue to be prohibited; gathering of dead and down wood for use in campfires will be permitted.
11. Murray Springs, Fairbank Cemetery, Kingfisher Interpretative Site (except for the trail that surrounds the site), Lehner, Millville mills and petroglyphs, and Clanton Ranch will be closed to equestrians and mountain bikers. Equestrians and mountain bikers will be limited to existing trails in all other developed recreational, education, and interpretative sites.
12. The use of metal detectors will be prohibited.
13. Develop trail connections from nearby communities to the San Pedro Trail system.
14. Manage the following developed recreation facilities in support of recreation objectives and recreation setting characteristics:
  - San Pedro Ranch House Complex; Fairbank Historic Townsite Complex; Boquillas Ranch Headquarters; Little Boquillas trailhead; Horsethief camping area; Hereford camping area; Murray Springs Clovis Site; Escapule trailhead; Millville Complex; Charleston trailhead; Presidio Santa Cruz de Terrenate; Land Corral; Curtis Flats (new); Hereford; Lehner Mammoth-Kill Site; Palominas; Babocomari (new); Brunckow Cabin; Clanton Ranch; Contention City; Lewis Spring Trailhead; Miller Backcountry Camp; Summers Lane; Whitehouse Wetland Area

15. Manage the access and transportation system to provide appropriate access to public use areas.
16. Hunting with firearms is allowed throughout the SPRNCA, with the exception of a portion of the Rural RMZ around the San Pedro House and areas one-quarter mile from associated recreation facilities (totaling 5,530 acres), in accordance with AZGFD hunting regulations (see Figure 19 of the BA).
17. Trapping will be managed in accordance with Arizona state hunting regulations.
18. SRPs may be issued as a discretionary action, consistent with current BLM policy for activities that 1) support recreation and visitor services objectives and direction, 2) satisfy a public demand that is not being met, and 3) will not cause public health and safety issues. SRPs will be subject to special terms, conditions, and stipulations to protect public safety and resource values and to prevent or avoid use conflicts. Individual SRPs will continue to be required for noncommercial backcountry camping.
19. Maintain and improve existing staffed sites to provide visitor contact, information, interpretive and educational facilities, programs, and services (San Pedro House and Fairbank Historic Townsite).
20. Maintain and improve existing and proposed self-service or unstaffed sites to provide educational and interpretive facilities and materials with SPRNCA-wide themes.
21. Deliver educational and interpretive programs through displays, exhibits and signs, handouts, flyers, brochures, publications, special programs or events, walks, field trips, school and youth programs, special events, the internet, and social media.
22. Provide guided and supervised programs in the field focusing on themes available on-site and representing the SPRNCA resources.

#### *Land Use Allocations*

1. Designate the 55,990-acre SPRNCA as an extensive recreation management area (ERMA), with different zones to achieve different objectives.
2. Manage uses, activities, and settings according to the following RMZs as delineated in Figures 11 and 12 of the BA:
  - Primitive—16,870 acres; nonmotorized, nonmechanized (except as provided by law), and undeveloped types of recreation; bicycles are considered mechanical transport, so their use is not considered primitive and unconfined recreation.
  - Backcountry—30,960 acres; areas with undeveloped, primitive, and self-directed visitor experiences without provisions for motorized or mechanized access, except for identified routes.
  - Backcountry (motorized)—3,010 acres; areas with undeveloped, primitive, and self-directed visitor experiences with provisions for motorized or mechanized access.
  - Rural—5,150 acres; areas with self-directed and organized visitor experiences; area is not remote and is readily accessed from public highway with improved roads and parking areas for passenger cars and large vehicles (trailer towing vehicle, bus, and motor home).

### *Recreation Site Reasonably Foreseeable Development*

There is only one new recreation site proposed of less than 1 acre. The BLM assumed potential trails to be in the same location and to be the same extent as those that were designated in the 1995 Intermodal EA (BLM 1995).

### *Planned Trail Reasonably Foreseeable Development Scenario*

The BLM assumed potential trails to be in the same location and be the same extent as those that were designated in the 1995 Intermodal EA (BLM 1995). Four miles (1.2 acres) of planned trails are assumed under each alternative; however, the actual number and location of trails could change, based on implementation-level travel management planning.

### **Travel Management**

1. Public nonmotorized mechanized use (bikes, wagons, and carts) will continue to be allowed on the San Pedro Trail System, other designated roads, and administrative vehicle routes; mileage to be determined in the travel management plan.
2. Nonmotorized game carts will be allowed cross-country for retrieving game.
3. Horses and other riding livestock will not be allowed on interpretive paths in developed education sites.
4. Horses and other riding livestock use will be allowed on designated roads, primitive roads, and trails and cross-country throughout the SPRNCA, unless otherwise prohibited and posted.
5. Route designations will be determined through an interdisciplinary route evaluation process that will result in a comprehensive transportation plan for the SPRNCA. Approximately 202 miles on the SPRNCA route inventory will be evaluated. The route evaluation process will use the following criteria:
  - The conservation values of Arizona-Idaho Conservation Act of 1988 (PL 100-696)
  - Access purpose and type of use (car, truck, bus, all-terrain vehicle, horse and other riding livestock, foot, and bicycle)
  - Legal status and jurisdiction
  - Route condition
  - Connectivity with towns, municipalities, and adjacent residential communities
  - Recreation, education, and interpretive opportunities
  - Access needs related to RMP decisions
  - Emergency and law enforcement use
  - Potential conflicts among various users
  - Potential resource impacts, as identified through 43 CFR 8342.1: minimize damage to soil, watersheds, vegetation, air, or other resources of the public lands and harassment of wildlife or significant disruption of wildlife habitats; Special attention will be given to protect endangered and threatened species and their habitats and to not adversely affect natural, aesthetic, scenic, or other values.
6. Identify as decommissioned those routes not needed to accommodate access and allow or enhance natural revegetation; develop site- and route-specific project plans if surface

disturbance is needed to restore natural drainage patterns and stabilize erosion, remove weeds or hazards, or control entry.

7. Acquire legal access where needed across nonfederal land to achieve management objectives; access acquisition will be from willing landowners and according to federal acquisition procedures and state laws and regulations.
8. New designated routes may be constructed, improved, or maintained to achieve management objectives and to avoid conflicts or protect resources.
9. Maintenance standards, guidelines, and intensities will be identified in the travel management plan for the designated transportation system.
10. In areas allocated as limited, motorized use should keep within the designated routes, with reasonable use of the shoulder and immediate roadsides, allowing for vehicle passage, emergency stopping, and parking, unless otherwise posted.

#### *Land Use Allocations*

1. Except where needed for administrative or emergency purposes, the use of motorized vehicles in the conservation area should be allowed only on roads, primitive roads, and trails specifically designated for such use (PL 100-696) and to achieve resource management objectives.
2. Off-highway vehicle (OHV) designations under these alternatives, shown on Figure 17 of the BA:
  - Open—0 acres
  - Closed—0 acres
  - Limited to designated roads, primitive roads, and trails to protect natural resources and accommodate motorized access—55,990 acres.

#### **Lands and Realty**

1. The SPRNCA will be closed to all commercial energy development; consider developing noncommercial, public, renewable energy projects to support BLM SPRNCA administration or recreation facilities, such as restrooms and public access facilities, on a case-by-case basis.
2. The SPRNCA will be closed to new communication sites, except for those proposed by government agencies to provide for emergency services, health and safety, or administrative uses; these will be considered on a case-by-case basis. The SPRNCA will be available for the development of facilities to support rural broadband internet service, where it is compatible with conservation values of the NCA where nearby land administered by the DOI are unavailable for use.
3. Renewal of existing ROWs will be considered on a case-by-case basis, with possible new stipulations to reduce impacts on the conservation values of the SPRNCA.
4. Other leases and permits will be allowed on the SPRNCA only if they will further the primary purposes for which the conservation area was established and do not compromise the rights of other authorized land users. These authorizations could include the following:



- Activities of less than 1 acre in ground disturbance; Apiaries; Filming permits; Geophysical exploration methods and associated survey monuments; Meteorological devices
5. PL 100-696 states specifically that all federal lands on the SPRNCA are withdrawn from disposal and mineral entry under the public land laws. It also allows lands within the boundaries of the SPRNCA to be acquired through exchange, purchase, or donation. Any lands acquired will be managed in accordance with the conservation values outlined in PL 100-696 and the approved RMP and ROD.
  6. Prioritize the acquisition of inholdings and edge holdings, in accordance with the 2017 Land Tenure Adjustment Strategy for Arizona (BLM 2017a).
  7. Secure easements across non-BLM-administered lands to provide legal access to the SPRNCA where needed on a case-by-case basis; in addition, pursue interest in lands (e.g., public access, water rights, and mineral rights).
  8. A withdrawal revocation action for the Charleston Dam and Reservoir will be forwarded to the Secretary of the Interior for approval to clear the record of this withdrawal that is no longer needed. If the withdrawal is revoked, the land will be managed according to decisions in this RMP.
  9. Retain all land and do not consider Recreation and Public Purposes leases and patents.
  10. Existing land use authorizations, including the operation and maintenance of ROWs for utility lines, are limited to and managed in accordance with the valid existing rights granted before the SPRNCA was designated. Maintenance of these facilities will be permitted, subject to compliance with current BLM policies and practices, in such a manner that reduces impacts on SPRNCA resources.
  11. Routes identified as closed to the general public will be available for use by utility companies to access utilities and for maintenance. The BLM or utility companies may maintain these routes, as needed to provide access.

#### *Land Use Allocations*

1. Continue to manage the Charleston Road ROW utility corridor, as described in Alternative A (defined as 375 feet north of the centerline of the Charleston Road and 375 feet south; Figures 20 and 21 of the BA).
2. The entire SPRNCA will be an avoidance area for new ROWs, except for the Charleston Road ROW utility corridor (Figure 2-30 in Appendix A of the BA). Areas outside this corridor may be considered for ROWs, including those that provide for the following:
  - Access to private property in-holdings and private property next to the SPRNCA when there is no other reasonable access across nonfederal land
  - Emergency, public safety, and administrative uses

Proposed ROWs must further the primary purposes for which the conservation area is established. Stipulations will be included to reduce impacts on the conservation values of the SPRNCA. BMPs discussed in Appendix G of the EIS will be the minimum required for all ROW projects.

*ROW renewal and amendment (new/not analyzed in EIS) Reasonably Foreseeable Development Scenario*

The BLM has discretion when holders of existing ROWs propose amendments or upgrades to their authorization, or when maintenance and operations will cause ground disturbance outside of the authorized ROW. In these events, the BLM has the authority to require analysis and mitigation under NEPA and Section 7 consultation under the ESA, which can include conservation measures.

**Wild and Scenic Rivers**

1. Outstandingly remarkable values (ORVs) identified in the eligibility report for the San Pedro River corridor are scenery, recreation, fish and wildlife habitat, cultural, historic, botanic, and paleontological.
2. The Babocomari River study corridor ORVs are scenery, recreation, fish, wildlife, historic, and cultural.
3. Implement protective management to ensure free-flowing conditions, water quality, tentative classification, and ORV protection, consistent with management guidelines for the appropriate classifications (see Appendix O of the EIS).
4. Remediate hazardous abandoned and inactive mines to protect and enhance water quality, the tentative classification, and ORVs.
5. Limit motorized and nonmotorized mechanized vehicle travel to designated routes.
6. During travel management planning, evaluate the impacts of all routes on ORVs and mitigate them appropriately.
7. The entire SPRNCA will be a ROW avoidance area, as described in Section 2.5.14 of the EIS. Any new ROWs in the Charleston Road ROW utility corridor or for access to private land will have special stipulations to protect the free-flowing conditions, water quality, tentative classification, and ORVs.
8. Consider maintenance and upgrades of ROWs on a case-by-case basis, with special stipulations to protect free-flowing conditions, water quality, tentative classification, and ORVs.
9. Allow recreation uses and activities consistent with the river classification and to protect the free-flowing conditions, water quality, tentative classification, and ORVs.
10. Allow recreation facilities to be maintained, including replacing and upgrading them, to achieve recreation management objectives, while protecting free-flowing conditions, water quality, tentative classification, and ORVs.
11. Develop new facilities in the study corridor to meet recreation management objectives, while protecting free-flowing conditions, water quality, tentative classification, and ORVs.
12. Minor wildlife habitat improvement projects, including structures and developments, will be considered, such as fisheries and aquatic habitats, riparian habitat, and upland habitats, if they are designed to preserve, protect, or enhance the river's free-flowing conditions, water quality, tentative classification, and ORVs.
13. Vegetation treatments will be considered, including consistency with the river's free-flowing conditions, ORVs, water quality, and tentative classification.
14. Livestock grazing will be authorized in upland portions of the river study corridor but not in the riparian area, except for the Babocomari. Grazing will be managed to protect free-flowing conditions, water quality, tentative classification, and ORVs.

15. Existing range improvements (fences, corrals, and water developments) will be maintained.
16. New range projects will be allowed if the project design is consistent with free-flowing conditions, water quality, tentative classification, and ORVs.
17. A full range of noxious species treatments (biological, chemical, mechanical, and prescribed fire) will be allowed. This will be to prevent and control the spread of terrestrial and aquatic species and to protect free-flowing conditions, water quality, tentative classification, and ORVs. It will be consistent with guidance in the Vegetation section of the EIS and applicable policies and regulations.
18. New impoundments, hydroelectric power projects, or diversions will not be allowed.
19. The study corridors will be managed under visual resource management (VRM) Class II to protect the free-flowing conditions, water quality, tentative classification, and ORVs.
20. Removal of hazardous fuels will be allowed in designated locations to protect public safety, free-flowing conditions, water quality, tentative classification, and ORVs.
21. Watershed improvement will be allowed to promote groundwater recharge and sustain in-stream flows, provided the river's free-flowing condition, water quality, tentative classification, and ORVs are protected.
22. Minor structures and developments will be allowed to preserve, protect, or enhance the river's free-flowing conditions or to protect its ORVs and water quality, consistent with the river segment classifications, such as watershed restoration/enhancement projects, vegetation management, bank stabilization projects, and channel restoration projects.

#### *Land Use Allocations*

1. The San Pedro River study corridor boundary varies according to topography to include the river bottomland and immediately adjacent slopes. The river study corridor includes approximately 48.3 river miles and 16,570 preliminarily suitable acres on the SPRNCA.
2. Manage the San Pedro River study corridor according to the following classification shown on Figure 22 of the BA (existing management shown in Figure 23 of the BA):
  - Recreational: 16,570 acres
  - Scenic: 0 acres
  - Wild: 0 acres
3. The Babocomari River study corridor is suitable for designation, including approximately 4 river miles and 480 acres on the SPRNCA in areas not overlapping with the preliminarily suitable San Pedro River corridor.
4. Manage the Babocomari study corridor according to the following classification shown on Figure 24 of the BA (existing management shown in Figure 25 of the BA):
  - Recreational: 480 acres
  - Scenic: 0 acres
  - Wild: 0 acres

#### **Administrative Actions**

The RMP includes administrative actions that occur or may occur in the future. However, none of these actions relate to decisions in the RMP and, therefore, may be referenced or mentioned, but will not be analyzed in-depth. These activities are consulted on as projects should they be determined to have an effect on a listed species or critical habitat.

### *Water Resources*

1. Continue the water quality testing program. This includes drinking water quality at San Pedro House and Fairbank and testing for *Escherichia coli*, sediment, temperature, pH, electrical conductivity, and dissolved oxygen among others in the San Pedro River.
2. Prioritize data collection for surface waters where there is a suspected or known pollution threat or hazard to water quality.
3. Assess potable water systems to determine if any systems should be decommissioned or modified to conserve water. Continue to inspect, test, and maintain systems to prevent unnecessary loss of water.
4. Collaborate with partners to develop a web-based information portal for sharing and interpreting scientific data on resources in the San Pedro watershed.
5. Cover and seal unusable or unsuitable wells to prevent contamination of aquifers and vadose zones and to contain highly saline water.

### *Cultural Resources*

1. Prepare a comprehensive Class I overview and updated cultural context for the entire SPRNCA planning area.
2. Identify data gaps to prioritize Class III inventory and scientific investigation of areas known or likely to contain unique and threatened, or both, cultural resource types, such as rock art and Archaic, Sobaípuri, and Apachean sites.

### *Paleontological Resources*

1. Inventory PFYC Class 3, Class 4, and Class 5 areas for any new vertebrate fossil localities that may be exposed due to naturally occurring erosion or ground-disturbing activities.
2. Survey all PFYC Unknown (Class U) areas to accurately reflect the presence of paleontological resources and assign an accurate PFYC value.
3. Develop and maintain a geographical information system (GIS) database of known fossil localities on the SPRNCA.
4. Monitor for and collect scientifically significant fossil resources that are exposed in livestock concentration and range improvement areas.
5. House collected fossils in a qualified repository.

### *Wildland Fire and Management*

1. Review fire management plan and wildland fire decision support system and amend the fire management plan if there are any new standard operating procedures (SOPs) or other restrictions.

### *Fish, Wildlife, and Special Status Species*

1. Survey for nonnative, invasive aquatic species periodically in areas where they have not yet invaded and control as necessary.
2. Northern Mexican garter snake: Evaluate unoccupied areas on the SPRNCA for habitat suitability.
3. Yellow-billed cuckoo: Survey previously unsurveyed riparian habitat and arid ephemeral drainages that contain one or more of the following tree species: hackberry, mesquite, oak, sycamore, walnut, soapberry, ash, desert willow, elderberry, willow, or cottonwood.

4. Revise/update the SPRNCA Habitat Management Plan (BLM 1993).

#### *Cultural Resources*

1. Prepare integrated resource site management plans for sites allocated to public use. Prioritize National Historic Landmarks planning, stabilization, and research to accommodate continued public use.
2. Develop cooperative cultural resources management or research agreements with local nonprofit groups, volunteer organizations, and academic institutions.
3. In accordance with the BLM-Arizona Protocol, participate in the Arizona Site Steward Program to supplement staff monitoring and increase site protection.
4. Develop an updated cultural history for the SPRNCA; frame local histories and sites within the context of the surrounding landscape.
5. Develop research themes, questions, and plans for specific sites or site types and promote and encourage research that targets data gaps.
6. Develop a SPRNCA cultural resources summary and interpretive and educational programs for public-use sites.
7. Reach out to and engage the public in the value of cultural resources.
8. To protect cultural resources use administrative and physical measures, such as signs, access barriers, patrols, fire control, stabilization, detailed recording, and public education.
9. Update and maintain cultural resources databases, maps, sites, and inventory records to current professional standards for use in research, compliance, and monitoring.
10. Work with lessees and applicants to design projects and activities to achieve cultural resource preservation or use objectives.

#### *Native American Concerns*

1. Identify and manage traditional, sacred sites, traditional use sites, and cultural landscapes, in consultation with Native American tribes.
2. Work with Native American tribes to identify suitable harvesting areas for herbals, medicines, and traditional use items for noncommercial, personal use.
3. Consult with Native American tribes with cultural and historic ties to the SPRNCA in accordance with BLM Manual 1780 (BLM 2016) and as consistent with applicable laws, regulations, and authorities.

#### *Visual Resources Management*

1. Visual contrast ratings will be completed on proposed projects. This will be done to assess potential visual impacts and identify visual design guidelines to ensure VRM objectives are achieved. Mitigation measures to reduce potential visual impacts will include site selection, material selection, screening, rehabilitation, and color treatment of structures.
2. BLM-initiated projects (vegetation treatments, earthwork, ground-disturbing activities, and road or structure construction) will incorporate visual design techniques to ensure that VRM objectives are met.
3. During NEPA review, the BLM will identify mitigation measures for external project proposals with potential visual impacts; it will implement the measures through special stipulations to ensure that VRM objectives are met.

4. The BLM will conduct field analyses to ensure that the project elements are designed appropriately to fit the natural landscape.
5. A BLM contractor will produce visual simulations, guided by the BLM. The simulations will assist in developing project design features and mitigation measures to reduce impacts on visual resources. They also will be used to complete contrast ratings.
6. The BLM will monitor visual resource conditions for impacts from land use activities and for effectiveness of design requirements.
7. Night lighting required for any purpose will require measures to protect night skies from light pollution.

#### *Livestock Grazing*

1. Ensure lessees monitor, maintain, and repair fences, as appropriate.

#### *Energy and Lands and Realty*

2. The BLM will review existing ROWs for reclaiming historic railroad grades across the SPRNCA. It will do this to determine if the ROWs have been abandoned according to Surface Transportation Board (STB) procedures (PHX-014180, PHX-016320, PHX-018518, PHX-058765, PHX-059615, PHX-059620, PHX-086526, PHX-086569, PHX-086622, and PHX-086647).
3. The BLM will pursue abandonment procedures or will obtain permission to use the ROWs for the San Pedro Trail system. This will be the case if the historic railroad track ROWs were not abandoned in accordance with STB procedures, for example, if the tracks had been removed and vegetation is growing in the rail bed.

### **Conservation Measures**

Conservation of listed species and critical habitat is an integral part of the RMP; however, specific conservation measures to reduce potential adverse effects associated with the proposed action will be developed through project level section 7 consultation on site-specific actions proposed under this RMP.

### **ACTION AND PROJECT AREA**

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. A description of the action area is provided below, including the past and present impacts of all Federal, State or private actions and other human activities in the action area. The Environmental Baseline section for each species includes additional species-specific action area information, as appropriate, but the information below will not be repeated.

The action area (or study area, as referred to by BLM) identified in Figure 1 is the U.S. portion of the Upper San Pedro Watershed which includes the RMP planning area (as referred to by BLM), or SPRNCA boundary, designated by Public Law 100-696, the Arizona-Idaho Conservation Act of 1988. The Upper San Pedro Watershed in the U.S. drains approximately 2,200 miles<sup>2</sup> and the SPRNCA boundary covers approximately 58,250 surface acres and includes

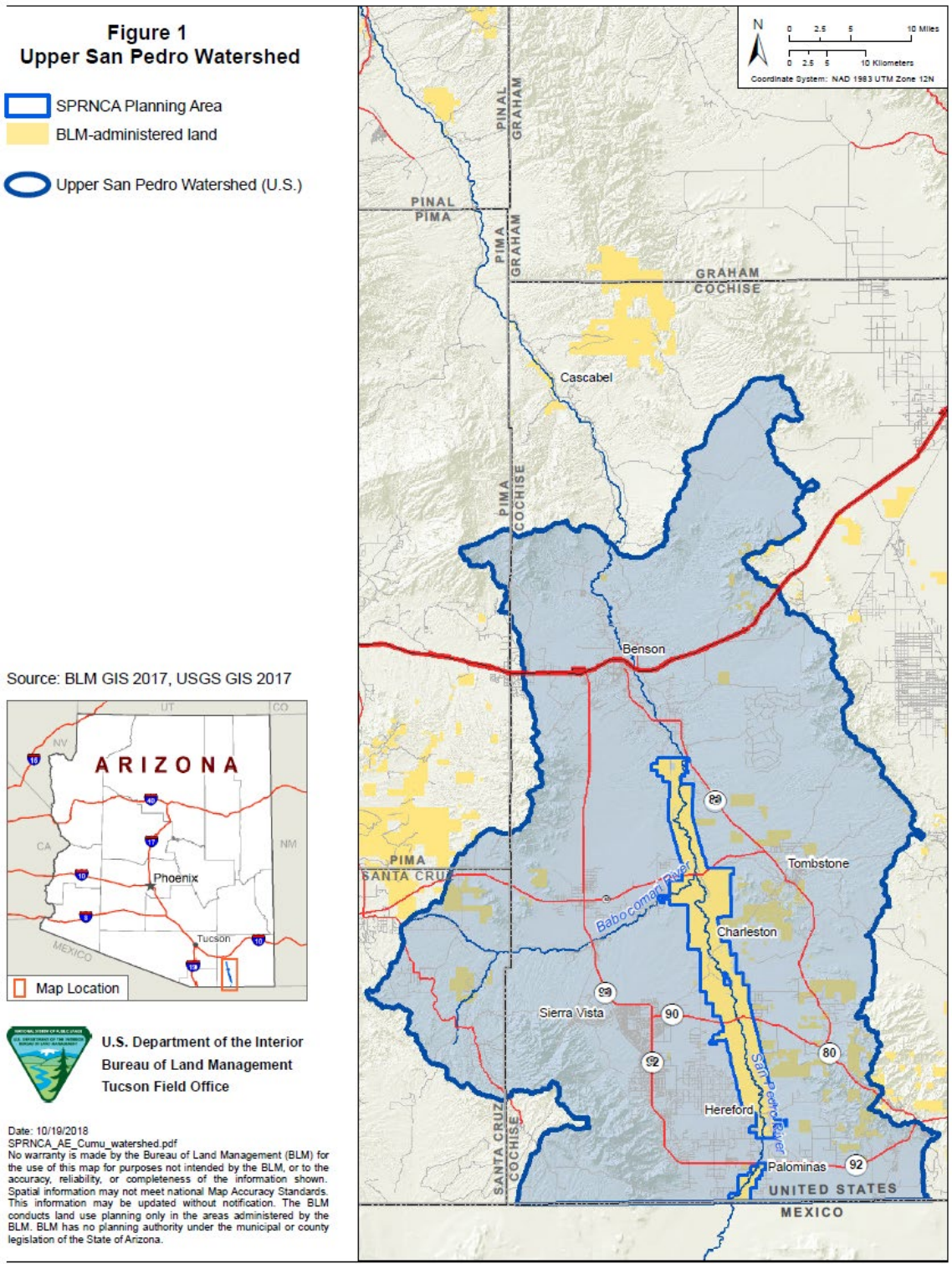
BLM-administered, private, and state land (Table 1). Landownership surrounding the SPRNCA includes federal land (U.S. Army, National Park Service lands, National Forest System land, and BLM-administered land); state land (Arizona State Land Department); and private land. The BLM is responsible for managing only public land in the planning area. The BLM-administered lands (55,990 acres) within the SPRNCA are referred to by the BLM as the decision area (i.e., project area) (Figure 1). The acres of public land reported in Table 1 are subject to change if the BLM acquires more land inside the planning area.

The action area is in the near the town of Sierra Vista, approximately 70 miles southeast of Tucson, in the counties of Cochise, Pima, and Santa Cruz, while the SPRNCA boundary is in Cochise County, south of Benson and west of Tombstone and Bisbee, Arizona. Sierra Vista is to the west of the SPRNCA. Access to the area is from Interstate 10 via State Highways 82, 90 and 92, county-maintained Charleston and Hereford roads, and BLM primitive roads and trails. The natural setting is in the Basin and Range physiographic province, in the Apachian Low Valleys and Low Hills ecoregion, which is in the Madrean Archipelago in southeastern Arizona. This ecoregion is characterized by basins and mountain ranges, with local relief of 3,000 to 5,000 feet. Native vegetation is mostly composed of grama-tobosa shrub-steppe in the basins, with oak-juniper woodland on the mountains. The San Pedro River is at the bottom of the upper basin, bordered by the Dragoons Mountains, Mule Mountains, Huachuca Mountains Mustang Mountains, and Whetstone Mountains. Elevation ranges from 3,650 feet above mean sea level at the north terminus to 4,290 feet at the international boundary. The climate is typical of the high deserts in southeastern Arizona, with warm to hot summers and cool to cold winters. Most of the annual precipitation is in the summer rainy season, usually from June to September.

The San Pedro River, one of the last undammed rivers with perennial stretches of water in the arid Southwest, originates approximately 20 miles south of the U.S.-Mexico border. It is close to Cananea, Mexico, and ends at its confluence with the Gila River near Winkelman, Arizona. The river elevation ranges from 4,260 feet above sea level at the U.S.-Mexico border to 1,920 feet above sea level at the Gila River confluence. Approximately 46 miles of the San Pedro River are on the SPRNCA.

Within the SPRNCA project area, many BLM actions have undergone section 7 consultation. These consultations and their relationship to the RMP are included in Table 2 below.

**Figure 1.** The San Pedro River National Conservation Area action (or study), planning, and project (or decision) areas in Arizona (from BLM 2019).





**Table 1.** Landownership inside the San Pedro River National Conservation Area planning area in Arizona (from BLM 2019).

**Table 1**  
**Landownership Inside the SPRNCA**  
**Planning Area**

Ownership	Acres <sup>1</sup>
BLM	55,990
Private	1,970
State	280
International Boundary and Water Commission	10
<b>Total</b>	<b>58,250</b>

Source: BLM geographical information system (GIS) 2018  
<sup>1</sup>Rounded to the nearest ten acres

**Table 2.** Previous section 7 consultations in the San Pedro River National Conservation Area project area in Arizona (from BLM 2019).

**Table 2**  
**Previous consultations in the project area**

RMP Category	Addressed or Partially Addressed in a Section 7 Consultation (Y/N)	If Y, Name, Number, and Date of Consultation	If Y, with CH Species Covered and Formal/Informal (F/I)
All	Y (partial)	Draft Safford District Management Plan and EIS (02-21-88-F-114, 02-21-05-F-0086); issued 4-5-1990	Desert Pupfish (DP), Gila Topminnow (GT) (F)
Wildfire	Y (partial)	Biological and Conference Opinion for BLM AZ Statewide Land Use Plan Amendment for Fire, Fuel and Air Quality Management. 02-21-03-F-0210; issued 9-3-2004	Southwestern willow flycatcher (SWFL), DP, GT, Huachuca Water Umbel (HWU) (F) Jaguar, ocelot (I)
Wildfire, fire (fuel breaks only)	Y (partial)	Proposed Upper San Pedro Riparian fire breaks, tiered to programmatic BO for BLM Arizona statewide fire, fuels, and air quality management. 02-21-05-F-0582, 02-21-03-F-0210; issued 8-26-2005	SWFL (F)
Fish, wildlife, and special status species	Y	Biological Opinion on Aquatic Species Conservation at the San Pedro and Las Ciénegas NCAs (22410-2008-F-0103); issued 12-31-2008	GT, DP, HWU (F), SWFL (I)
Livestock grazing	Y (partial)	Biological Opinion on the Gila District Livestock Grazing Program (22410-2006-F-0414, 02-21-92-F-070, 02-21-96-F-160, 02-21-96-F-0160R5, 02-21-96-F-	SWFL, DP, HWU and CH, (F) Jaguar, ocelot (I)

**Table 2**  
**Previous consultations in the project area**

<b>RMP Category</b>	<b>Addressed or Partially Addressed in a Section 7 Consultation (Y/N)</b>	<b>If Y, Name, Number, and Date of Consultation</b>	<b>If Y, with CH Species Covered and Formal/Informal (F/I)</b>
		0422, 02-21-96-F-0423, 02-21-00-F-0029, 02-21-03-F-0462, 02-21-04-F-0022, 02-21-04-F-0454, 02-21-05-F-0086, 22410-2007-F-0225, 22410-2007-F-0119, 22410-2007-F-0233, 22410-2008-F-0103), issued 5-21-2012	
Wildfire, (fuel breaks only)	Y (partial)	Formal Consultation and Conference Report on Twenty-Five Fuel Break Treatment Sites on the Gila District within Graham, Pima, and Cochise Counties, Arizona 02EAAZ00-2015-F-0431; issued 11-7-2016	Northern Mexican gartersnake (NMGS), SWFL, (F) Yellow-billed cuckoo (YBC), jaguar, ocelot, HWU and CH (I)
Rights-of-way	Y (partial)	Biological and Conference Opinion on APS/SRP vegetation treatment/maintenance within Authorized Power Line Rights-of-Way (ROWs) on BLM Lands in Arizona (02EAAZ00-2016-F-0011); issued 10-6-2017	SWFL, YBC (F), DP, GT, ocelot, HWU and CH, NMGS (I)
Vegetation management		1995 San Pedro Riparian National Conservation Area Tamarisk Management Project (Consultation #22410-2009-I-0195), reinitiated in 2018 (Reinitiation of San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation # 02EAAZ00-2018-F-1018])	YBC (I), NMGS (F)

## STATUS OF THE SPECIES — OCELOT

### Description, Legal Status, and Recovery Planning

The ocelot (*Leopardus pardalis*), a medium-sized spotted cat, belongs to the genus *Leopardus* which also includes the margay (*Leopardus wiedii*) and the oncilla (*Leopardus tigrinus*). The ocelot has been divided into as many as 11 subspecies that ranged from the southwestern U.S. to northern Argentina (USFWS 2016). Two subspecies occur in the United States (U.S.): the Texas ocelot (*L. pardalis albescens*) and the Sonora ocelot (*L. p. sonoriensis*) (USFWS 2016). The ocelot weighs from 7-16 kg (15-35 lbs), with males weighing more than females (USFWS 2016). The coloration of the upper parts of the body is pale gray to cinnamon. There are spots on the head, two black stripes on the cheeks and four to five longitudinal black stripes on the neck. The body shows elongated black-edged spots arranged in chain-like bands. The rounded ears are black dorsally, with a conspicuous white spot. The underparts are whitish, spotted with black. The tail is marked with dark bars or incomplete rings (Hall 1981).

The ocelot was listed as endangered in 1972 under the authority of the Endangered Species Conservation Act of 1969 (USFWS 1972). The 1969 Act maintained separate lists for foreign and native wildlife. The ocelot appeared on the foreign list, but due to an oversight, not on the native list. Following passage of the ESA in 1973, the ocelot was included on the January 4, 1974, list of “Endangered Foreign Wildlife” that “grandfathered” species from the lists under the 1969 Act into a new list under the ESA (USFWS 1974). The entry for the ocelot included “Central and South America” under the “Where found” column in the new ESA list. Endangered status was extended to the U.S. portion of the ocelot’s range with a final rule published July 21, 1982 (USFWS 1982). The “Historic range” column for the ocelot’s entry in the rule reads, “U.S.A. (TX, AZ) south through Central America to South America.” However, the current list now reads, “Wherever found” under “Where listed.” The ocelot was upgraded to CITES Appendix I in 1986 (Nowell and Jackson 1996) and is considered endangered in Mexico under Mexican law (SEMARNAT 2010).

The species has a recovery priority number of 5C, meaning that it has a low potential for recovery with a relatively high degree of conflict. Recovery for the ocelot was originally addressed in Listed Cats of Texas and Arizona Recovery Plan (with Emphasis on the Ocelot) (USFWS 1990). The Recovery Plan for the Ocelot (*Leopardus pardalis*), First Revision, finalized in August 2016 (USFWS 2016), has the goal of improving the status of the species to the point that it no longer needs the protection of the ESA. Objectives of the plan call for 1) the assessment, protection, and restoration of sufficient habitat to support viable populations of the ocelot in the borderlands of the U.S. and Mexico; 2) the reduction of effects of human population growth and development to ocelot survival and mortality; 3) the maintenance or improvement of genetic fitness, demographic conditions, and health of the ocelot; 4) the assurance of long-term viability of ocelot conservation through partnerships, the development and application of incentives for landowners, application of existing regulations, and public education and outreach; 5) the use of adaptive management, in which recovery is monitored and recovery tasks are revised by the FWS in coordination with the Recovery Team as new information becomes available; and 6) the support of international efforts to ascertain the status and conserve the ocelot south of Tamaulipas and south of Sonora.

The major focus of the revised recovery plan is on two cross-border management units, the Texas/Tamaulipas Management Unit and the Arizona/Sonora Management Unit (ASMU). The boundaries of the ASMU are defined as the original range of the subspecies (*L. p. sonoriensis*) which generally extends from central Arizona south to southern Sinaloa. Delisting criteria for the ASMU are: 1) the ASMU metapopulation is estimated through reliable scientific monitoring to be at least 1,000 animals for 10 years and populations should be stable or increasing; 2) threats from habitat loss, habitat fragmentation, and poaching are reduced such that the ocelot can maintain healthy, viable populations for the foreseeable future; and 3) habitat linkages to facilitate an ASMU metapopulation have been identified and are conserved for the foreseeable future.

### **Life History and Habitat**

The life history of the ocelot has been summarized by Laack (1991), Laack et al. (2005), Tewes and Schmidly (1987), and others. Ocelots may live greater than 10 years in the wild and can live longer (18 years plus) in captivity (Murray and Gardner 1997). Gestation lasts about 70-80 days, and breeding reaches a peak during fall in Texas (Tewes and Schmidly 1987); however breeding peaks may vary throughout the ocelot range. Wild ocelots probably first produce young at about 18 to 30 months-of-age (Eaton 1977, Tewes and Schmidly 1987), although Laack (1991) observed first reproduction in wild female ocelots between 30 and 45 months-of-age. Average litter size is about 1 to 1.5 kittens per litter (Laack et al. 2005, Mora et al. 2000, Murray and Gardner 1997). Males are believed to contribute little to direct parental care (Tewes 1986, Laack 1991) and young may become independent at one year of age (Murray and Gardner 1997). There is little information on the interval between successive litters in the wild, but it is likely two years (Murray and Gardner 1997, USFWS 2016).

Although ocelots usually disperse from the natal range, sometimes females may remain in their natal range (Laack 1991). The age at which subadult ocelots disperse from the natal range varies, but is about two years of age (Ludlow and Sunquist 1987, Laack 1991). Laack (1991) found that there was no obvious sex difference in age at dispersal and that duration of successful dispersal (time elapsed between leaving natal range and establishing an independent home range) was 7 to 9.5 months. Studies have shown that dispersal distance varies considerably, for example, in Texas, dispersal distances have been documented between 2.5 kilometer (km) and 42.5 km (Navarro-Lopez 1985, Tewes 1986, Laack 1991, USFWS 2016). The longest documented dispersal distance (50 km/31 miles) that we are aware of was of a male ocelot in Tamaulipas, Mexico (Booth-Binczik 2007).

No studies have documented dispersal distance of ocelots in Sonora and Arizona; however, a subadult male ocelot was documented in Arizona in 2010 just west of Globe (it was killed by a car) (Holbrook et al. 2011). Ocelots have also been recently detected in the Whetstone (detected in 2009) (Avila-Villegas and Lamberton-Moreno 2013) and Huachuca Mountains (detections from 2011 to 2017). The nearest recently (in 2011) documented female with young (one kitten) was located about 48 km (30 miles) south of the international border in the Sierra Azul of Sonora, Mexico (Avila-Villegas and Lamberton-Moreno 2013). If ocelots documented in Globe and the Huachuca and Whetstone mountains dispersed from the nearest breeding population, assuming the nearest breeding population is the one previously mentioned, it means the ocelots moved about 220 km (135 miles) to Globe; 55 km (35 miles) to the Huachuca Mountains (email

from Tim Snow, AGFD, March 18, 2013), and 110 km (70 miles) to the Whetstone Mountains (Avila-Villegas and Lamberton-Moreno 2013). Avila-Villegas and Lamberton-Moreno (2013), however, believe that travel from northern Sonora to Globe seems unlikely. Additionally, a minimal travel distance (round trip) of 84 km (52 miles) was documented for an ocelot in the Huachuca Mountains who subsequently was documented in the Patagonia Mountains and then back in the Huachuca (Culver 2016).

Ocelots are solitary animals that maintain home ranges (Emmons 1988, Ludlow and Sunquist 1987, Laack 1991, Crawshaw 1995). Home range for the ocelot varies throughout its range. Adult female home range sizes vary from approximately 2 km<sup>2</sup> to 17 km<sup>2</sup> (494 to 4,201 acres) while adult male home range sizes vary from approximately 5 km<sup>2</sup> to 38 km<sup>2</sup> (1,235 to 9,390 acres), both depending on the habitat type in which they are found (Tewes 1986, Ludlow and Sunquist, 1987, Crawshaw and Quigley 1989, Emmons 1988, Konecny 1989, Laack 1991, Caso 1994, Crawshaw 1995, Fernandez 2002). In the Tamaulipan thornscrub of south Texas and northeastern Mexico, mean ocelot home range sizes reported include: Laack (1991): 6.2 km<sup>2</sup> (1,544 acres) for males, 2.87 km<sup>2</sup> (709 acres) for females; Navarro-Lopez (1985): 2.5 km<sup>2</sup> (623 acres) for males, 2.1 km<sup>2</sup> (512 acres) for females; Tewes (1986): 12.3 km<sup>2</sup> (3,039 acres) for males and 7.0 km<sup>2</sup> (1,730 acres) for females; and Caso (1994): 8.1 km<sup>2</sup> (2,006 acres) for males, 9.6 km<sup>2</sup> (2,372 acres) for females. No home range studies have been done for ocelots in Arizona or northwestern Mexico. However, in western Mexico, specifically in the tropical deciduous forest of Jalisco, average home range size using the Kernel estimator for male ocelots was 11.7 km<sup>2</sup> (2,891 acres) and for females was 5.8 km<sup>2</sup> (1,433 acres); average home range size using the 95% Minimum Convex Polygon estimator was 16.26 km<sup>2</sup> (4,018 acres) for males and 7.34 km<sup>2</sup> (1,814 acres) for females (Fernandez 2002). Additionally, Culver (2016) estimated minimum observed ranges for ocelots in Arizona and Sonora. The average minimum observed range of three Arizona ocelots was 30.09 km<sup>2</sup> (11.62 mi<sup>2</sup>), with minimum observed ranges ranging from 7.76 to 63.40 km<sup>2</sup> (3.00 to 24.48 mi<sup>2</sup>). The average minimum observed range of 9 Sonora ocelots was 11.75 km<sup>2</sup> (4.54 mi<sup>2</sup>) (1.97 to 31.49 km<sup>2</sup> / 0.76 to 12.16 mi<sup>2</sup>) (Culver 2016).

Ocelots inhabit a wide variety of densely vegetated habitat types, including, but not limited to, thorn scrub, semi-arid woodland, tropical deciduous and semi-deciduous forest, subtropical forest, lowland rainforest, palm savanna, and seasonally flooded savanna woodland (Tewes 1986, Ludlow and Sunquist 1987, Crawshaw and Quigley 1989, Crawshaw 1995, Fernandez 2002). In south Texas, ocelots occur predominantly in dense thornscrub communities (Navarro-Lopez 1985, Tewes 1986, Laack 1991). Laack (1991) also documented minimal use of Johnsongrass (*Sorghum halepense*) by ocelots. Caso (1994) found ocelots used primarily forest or woody communities in Tamaulipas, Mexico, and used the open pastures much less often.

In Sonora, López González et al. (2003) reported 27 of 36 (75%) of verified ocelot records in Sonora were associated with tropical or subtropical habitats, namely subtropical thornscrub, tropical deciduous forest and tropical thornscrub; a few ocelots were recorded in oak woodlands, but were all males. The mean elevation of the 33 records located with precision was 700 +/- 450 meters (2,297 +/- 1,476 feet), at which altitudes subtropical thornscrub is the main habitat (López González et al. 2003). They report that ocelots were associated largely with the mountainous Sierra region of eastern Sonora and that records closer to the Sonoran desert biome were mainly associated with riparian areas, where the shrub cover is relatively thicker than the

surrounding areas. Avila-Villegas and Lamberton-Moreno (2013) collected 59 camera photographs of ocelots in the Sierra Azul in northern Sonora, all of which were taken at elevation ranges between 1,275 and 1,625 meters (4,185 and 5,330 feet) in Madrean evergreen woodland.

Of the six ocelots recently recorded in Arizona, the one in the Whetstone Mountains was documented (via remote camera) in Madrean evergreen woodland (Avila-Villegas and Lamberton-Moreno 2013). A male ocelot that was killed by a vehicle west of Globe, Arizona, in 2010 (Holbrook et al. 2011) was in the interior chaparral vegetation community, at an elevation of 1,334 m within the Greater Oak Flat Watershed (AGFD as cited by Featherstone et al. 2013). Recent detections of three other ocelots in Arizona (in the Huachuca and Santa Rita Mountains) were located in the semidesert grassland (46%), Madrean evergreen woodland (46%), and Great Basin grassland (8%) biotic communities (Culver 2016). On average, all ocelot locations had 23% tree cover and were found at an elevation of 1,832 m. Additionally, on average, they were 2,335 m from perennial water sites and 6,337 m from major roads (Culver 2016).

Despite the variation in habitat use, the species does not appear to be a habitat generalist. Ocelot spatial patterns are strongly linked to dense cover or vegetation, suggesting it uses a fairly narrow range of microhabitats (Emmons 1988, Horne 1998). Horne (1998), in southern Texas, was the first to statistically analyze ocelot habitat selection patterns. He found ocelots used closed (>95% canopy closure) cover types more than cover types with less-than-moderate canopy cover and avoided mixed cover type (50-75% canopy closure). Also in southern Texas, Jackson et al. (2005) suggested that ocelots prefer closed canopy over other land cover types, but that areas used by this species tended to consist of more patches with greater edge. No habitat use studies have been conducted in Arizona or Sonora.

Ocelots are generally active for more than half of each 24-hour period and are typically most active at night and during crepuscular periods with more limited diurnal activity (Ludlow and Sunquist 1987, Crawshaw and Quigley 1989, Fernandez 2002, Avila-Villegas and Lamberton-Moreno 2013). Ocelots are likely generally nocturnal because they follow the nocturnal habits of their primary prey, small mammals (Ludlow and Sunquist 1987, Emmons 1988, and Crawshaw and Quigley 1989).

Ocelots are solitary hunters and eat a wide variety of prey, but small mammals, especially rodents, comprise most of their diet (Emmons 1987, Ludlow and Sunquist 1987, Crawshaw 1995, De Villa Meza et al. 2002, Fernandez 2002). Ocelot diets, however, also include medium to large mammals, reptiles, amphibians, birds, fishes, and insects (Emmons 1987, De Villa Meza et al. 2002, Fernandez 2002). Based on these results some authors have suggested that ocelots are opportunistic feeders (Bisbal 1986, Emmons 1987; as cited by De Villa Meza 2002).

### **Distribution and Abundance**

Ocelots historically ranged from Louisiana, Arkansas, Texas, and Arizona in the U.S. southward through Mexico, Central and South America to Peru and northern Argentina (Murray and Gardner 1997). Currently, the ocelot ranges from extreme southern Texas and southern Arizona through Mexico and Central America to Ecuador and northern Argentina and Uruguay (Murray and Gardner 1997, USFWS 2016). In Mexico, it has disappeared from much of its historical

range on the west coast (Caso et al. 2008). There are reports of the species up to 3,000 meters (9,842 feet) (Caso et al. 2008). We are not aware of any range-wide estimates of suitable ocelot habitat.

Estimating population sizes of secretive nocturnal carnivores, especially species that inhabit dense vegetative cover, such as the ocelot, is difficult. We are not aware of any range-wide estimates for ocelots; however, population size has been estimated in a number of countries. An effective population size of 10,000 to 528,732 individuals was estimated for Brazil (Oliveira et al. 2013). A total population of 1,500 to 8,000 individuals was estimated for Argentina (Aprile et al. 2012). A population of 2,025 +/- 675 ocelots in Sonora was estimated by López González et al. (2003) based on the distribution of these records and the availability of potential habitat. Gómez-Ramírez (2015) estimated a population of 1,421 ocelots in Sonora. The U.S. population of the Texas ocelot subspecies has fewer than 100 individuals, found in two separated populations in southern Texas (USFWS 2016). A third and larger population of the Texas/Tamaulipas ocelot subspecies occurs more than 200 km (~124 mi) south of the Texas/Mexico border in the Sierra of Tamaulipas, Mexico (Caso 1994). Stasey (2012) reported a population estimate of 371 ocelots in a 1,560 km<sup>2</sup> patch of habitat in the Sierra of Tamaulipas.

Since 2009, a total of six ocelots have been detected in Arizona, including five detected by trail cameras and hunting dogs, and one dead ocelot that had been struck by a vehicle. A description of these detections follows. In November 2009, a live ocelot (sex unknown) was documented in the Whetstone Mountains in Cochise County, Arizona, with the use of camera-traps (Avila-Villegas and Lamberton-Moreno 2013). In April 2010, a second ocelot was found dead on a road near Globe, Arizona. A genetic analysis was conducted and all data indicated the young male ocelot was not of captive but wild origin (Holbrook et al. 2011). Origin of the ocelot recovered in Globe is still unclear due to a lack of comparative samples from Arizona or Sonora although in the DNA analysis, it clustered with samples from Mexico. A two-year camera-trap study in the area near Globe, Arizona, did not photograph any additional ocelots (Featherstone et al. 2013).

In February 2011, a third male ocelot was treed by a hunting dog and photographed in the Huachuca Mountains. He was subsequently detected multiple times by trail cameras, including once in the Patagonia Mountains in May 2012 (Culver 2016), and was also treed by hunting dogs again (in the Huachuca Mountains). After being detected in the Patagonia Mountains he returned to the Huachuca Mountains, meaning that he traveled an approximate round trip distance of 84 km (Culver 2016). He was most recently detected in May 2013. In May 2012, a fourth male ocelot was detected in the Huachuca Mountains via trail camera. He has been detected many times via trail cameras, most recently in 2018, and treed by hunting dogs once. In April 2014, a fifth male ocelot was detected in the Santa Rita Mountains via trail camera. He was photographed several times over a two-month period and has not been detected since. Additionally, an ocelot was detected in December 2013 in the Santa Rita Mountains; however, it is unknown if this was the same as the fifth ocelot described above or a different ocelot. In March 2018, a 6<sup>th</sup> ocelot (male) was documented via trail camera in the Huachuca Mountains. In 2018, he was subsequently found dead in the Huachuca Mountains with injuries sustained from being struck by a vehicle.

In addition to the recent Arizona sightings, a number of ocelots have been documented just south of the U.S. border in Sonora, Mexico. Specifically, with the use of camera traps, six ocelots were documented between February 2007 and April 2011 in the Sierra Azul, about 30 miles southeast of Nogales, including two males, one female, one kitten, and two of undetermined sex (Avila-Villegas and Lamberton-Moreno 2013). Additionally, one ocelot was documented in 2009 in the Sierra de Los Ajos, about 30 miles south of the U.S. border near Naco, Mexico (USFWS 2016). Also in Sonora, López González et al. (2003) obtained 36 verified ocelot records, 21 of which were obtained after 1990, including 19 individual male records, 6 females, and 11 of undetermined sex. Out of these records, the northern-most record of a female was at 30°30' latitude and only one record was of a kitten (located in the southern part of Sonora) (López González et al. 2003).

Although methods used to calculate densities vary among studies, some ocelot population density estimates for particular habitats include: 2.02/100 km<sup>2</sup> (38.6 miles<sup>2</sup>) in tropical thornscrub to tropical deciduous forest in Sonora, Mexico (Gómez Ramírez 2015); 25/100 km<sup>2</sup> to 360/100 km<sup>2</sup> in the tropical deciduous forest of Jalisco (Fernandez 2002; Casariego Madorell 1998); 30 adult ocelots/100 km<sup>2</sup> in Bolivian dry-forests (Maffei et al. 2005); and 40 adult ocelots/100 km<sup>2</sup> in the llanos (interspersed dry tropical forest in savanna) of central Venezuela (Ludlow and Sunquist 1987).

### **Threats**

A detailed account of threats to ocelots is included in the 2016 Recovery Plan for the Ocelot, First revision. In summary, however, while the ocelot is protected over most of its range (Fuller et al. 1987), it is still threatened by habitat loss and fragmentation due to increased human development, agriculture, and cattle grazing; illegal killing (e.g., retaliatory killing due to depredation of poultry); and illegal trade (pet and pelt) (Fernandez 2002, Caso et al. 2008, USFWS 2016). Widespread commercial harvests for the fur trade ceased decades ago (Caso et al. 2008); however, human population growth and development continue throughout the ocelot's range. Connectivity among ocelot populations or colonization of new habitats is discouraged by the proliferation of highways and increased road mortality among dispersing ocelots. Increased illegal and law enforcement actions along the Mexico-U.S. border could limit ocelot movement across the border, but it is uncertain if and how much this is affecting that movement.

In Texas, collisions with motor vehicles appear to be the leading cause of known ocelot mortality and accounted for 45 percent of deaths of 80 radio-tagged ocelots between 1983 and 2002 (USFWS 2016). Newer information reveals this rate is now closer to 60 percent (USFWS unpublished data). In Arizona and Northern Sonora, since 2007, there have been five documented cases of ocelots being killed by vehicles or illegally killed, including: one ocelot struck by a vehicle close to Globe; one ocelot struck by a vehicle in the Huachuca Mountains; one ocelot struck by a vehicle on Mexico Highway 2, between Imuris and Cananea, Sonora; and two ocelots illegally killed in the Sierra Azul (email from Sergio Avila, Sky Island Alliance, March 15, 2013). The ocelot in the Huachuca Mountains was accidentally struck, while dark out, by a vehicle traveling at or below the speed limit in a 25 miles-per-hour single lane, paved road.



### **Conservation Efforts**

The ocelot is included on CITES Appendix I and is protected across most of its range (Caso et al. 2008). Part of the species range includes protected areas, including some capable of maintaining long-term viable populations (Caso et al. 2008). While loss and fragmentation of habitat adversely affect ocelot populations, there have been notable efforts to acquire, protect, and restore habitat, and decrease mortality of the species throughout its range. See a detailed account of planning and conservation efforts for the ocelots in the Texas-Tamaulipas and Arizona-Sonora Management Units in the 2016 Recovery Plan for the Ocelot, First revision.

## **ENVIRONMENTAL BASELINE — OCELOT**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of the ocelot analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above. The proposed action falls within the range of the Sonora subspecies as well as within the ASMU as defined in the Ocelot Recovery Plan (USFWS 2016).

### **Status of the species within the action area**

#### *Life History and Habitat*

Life history of the ocelot is described above in the Status of the Species. Generally, life history elements are similar throughout their range, although some, such as diet and vegetation community use vary by region (see Status of the Species). No home range studies have been done for ocelots in Arizona, recently, however, Culver (2016) estimated minimum observed ranges for ocelots in Arizona (two in the Huachuca Mountains and one in the Santa Rita Mountains). The average minimum observed range of the three Arizona ocelots was 30.09 km<sup>2</sup> (11.62 mi<sup>2</sup>), with minimum observed ranges ranging from 7.76 to 63.40 km<sup>2</sup> (3.00 to 24.48 mi<sup>2</sup>).

Although no habitat use studies have been conducted for ocelots in Arizona, based on limited records, Arizona ocelots appear to be associated with Madrean evergreen woodland (Culver 2016, Avila-Villegas and Lamberton-Moreno 2013), semidesert grassland, and Great Basin grassland biotic communities (Culver 2016).

### *Distribution, Abundance, and Population Trends*

Ocelots are rare in Arizona. As discussed in the Status of the Species, since 2009, six ocelots have been documented in Arizona, including in the Santa Rita, Patagonia, Huachuca, and Whetstone mountains. Since 2011, three ocelots have been documented in the action area; however, they have not been documented on the SPRNCA. The SPRNCA is about 10 miles east of the Huachuca Mountains, well within the documented dispersal/travel distance of ocelots.

### *Threats*

Threats to ocelots in Arizona are similar to threats to the species throughout its range as described under “Status of the Species.” Primary factors affecting the ocelot in the action area include habitat loss and fragmentation due to, among other things, urban expansion, mining, roads, and border infrastructure. Connectivity among ocelot populations or colonization of new habitats is discouraged by the all of these factors.

Examples of more specific threats to ocelots in this region are mining (such as the proposed Rosemont, Hermosa, and Sunnyside mines) and international border issues such as 1) infrastructure along and near the U.S. - Mexico border, including pedestrian and vehicle barriers and towers and their associated roads and lighting; and 2) illegal and U.S. Border Patrol traffic (pedestrian and vehicle). Fences designed to prevent the passage of humans (i.e., pedestrian barriers) likely also prevent passage of ocelots. Other infrastructure (e.g., vehicle barriers, towers, roads, and lighting) and human activity may limit ocelot movement across the border, but it is uncertain if and how much this is affecting that movement. Connectivity to Mexico is likely essential for maintaining ocelots in Arizona (the northern portion of the ASMU). As included in the recovery criteria for this species, delisting the species will require that habitat linkages to facilitate an ASMU metapopulation are identified and conserved for the foreseeable future.

### *Conservation Planning and Implementation*

As described in the 2016 Recovery Plan for the Ocelot, First Revision, some planning and conservation efforts have been made for the Sonora subspecies.

### *Past and Ongoing Federal Actions in the Action Area*

Six projects have undergone formal section 7 consultation for effects to ocelot in southern Arizona; although none of these occur in the SPRNCA or larger action area for the proposed action. For all consultations, incidental take of four ocelots has been authorized and no jeopardy opinions have been issued. A summary of these consultations is below:

1. *Biological Opinion on Acquisition of Wildlife Habitat Along the San Pedro River, Cochise County, Arizona* (Consultation Number 2-21-86-F-8 issued on December 9, 1985).

This consultation analyzed the effects of USDI-BLMs acquisition of 35,000 acres to form a new national wildlife refuge. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots, but will promote the conservation of the species.

2. *Biological Opinion and Conference Opinion for the Rosemont Copper Mine, Pima County, Arizona* (Consultation number 22410-2009-F-0389 issued October 30, 2013 and the reinitiated consultation, number 22410-2009-F-0389R1 issued April 22, 2016)

The original biological opinion for this project was issued in 2013; however, consultation was reinitiated and the final revised opinion was issued in 2016. The 2016 consultation addressed the effects of construction and operations of the copper mine, including the mine pit, waste rock piles, tailings, access roads, utility corridors, and onsite facilities (i.e., the mine “footprint”). The project area acreage, expected to result in direct impacts owing to project activities, is 5,431 acres. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots and anticipated that, due to construction and operation of the mine, ocelots could shift home range location and travel longer distances, and the take of one ocelot over the life of the project in the form of harassment.

3. *Biological Opinion on Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona* (Consultation number 22410-2013-F-0247 issued May 16, 2014)

This consultation addressed the effects of operations and activities to meet mission objectives of Fort Huachuca, including tenant-specific activities within Fort Huachuca training areas, air operations associated with Libby Army Air Field, recreational opportunities, resource management, realty actions, and programmed facilities development projects both on post and off post that are master planned. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots and anticipated incidental take of one ocelot as a result of implementation of the proposed action in the form of harm and harassment.

4. *Biological Opinion on the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services Nationwide Wildlife Damage Management Program* (Consultation number FWS/AES/DCHRS/BCH/045455, issued July 7, 2010 and the reinitiated consultation, number 22410-2010-F-0422-R001 issued June 27, 2017).

This consultation addressed the effects of U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services’ Nationwide Wildlife Damage Management Program on ocelots. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots and anticipated incidental take of one ocelot in the form of harm, harass, wound, kill, trap, or capture.

5. *Biological Opinion on the Coronado National Forest’s Revised Land and Resource Management Plan* (Consultation number 02EAAZ00-2015-F-0347, issued April 13, 2017).

This consultation addressed the effects of Coronado National Forest’s Revised Land and Resource Management Plan on ocelots. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots and we did not anticipate any incidental take as the proposed action was a “framework programmatic action” that did not authorize future actions.

6. *Reinitiated Biological Opinion for the Huachuca FireScape Project, Cochise County, Arizona* (Consultation number 02EAAZ00-2008-F-0451 R2, issued July 25, 2018).

This consultation addressed the effects on ocelots of implementation of projects resulting from unified planning for fire and fuel reduction activities among the USFS (Coronado National Forest), the Department of Defense (DOD-Fort Huachuca) and the NPS (Coronado National Memorial) in the Canelo Hills, San Rafael Valley, and Huachuca, Patagonia, and Whetstone Mountains of southeastern Arizona. We determined that the proposed action was not likely to jeopardize the continued existence of ocelots and anticipated incidental take of one ocelot in the form of harassment.

In addition to the aforementioned activities, DHS/CBP has constructed border infrastructure including towers, vehicle barriers, and pedestrian fences, in the action area that have not undergone formal consultation for ocelots. Furthermore, CBP – Tucson Sector regularly conducts patrol activities within the action area that may affect ocelots and have not undergone formal consultation.

*Summary of the Status of the Species in the Action Area*

Arizona represents the northernmost distribution of ocelots and ocelots were likely never common or as densely distributed in this portion of their range as compared to core areas of their range. That said, the aggregate effects of habitat loss and fragmentation and disturbance to ocelots resulting from a myriad of human activities are likely partially responsible for the scarcity of ocelots present in Arizona today.

**EFFECTS OF THE ACTION — OCELOT**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

We anticipate that the proposed action, the SPNRCA RMP, will result in net beneficial effects on ocelots by, among other actions, maintaining and managing for wildlife habitat. Overall, such management should provide opportunities for ocelots to use the SPRNCA on a long-term (i.e., establish a home range) or short-term (i.e., use a movement corridor) basis. That said, individual components of the SPRNCA RMP are likely to adversely affect ocelots; these effects are discussed in the RMP components' sections below.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on ocelots in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level section 7 consultations. Furthermore, potential adverse effects associated the RMP may be minimized through implementing conservation measures. Because these measures will be developed

through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

The aim of the analysis below is to point out activities in the RMP that may affect ocelots and discuss the general types of effects these activities may have on the species. In some cases, management actions lack detail (e.g., Review and assess water needs for resources managed on the SPRNCA and acquire and perfect new water rights as deemed necessary for management) to understand if they will have associated on-the-ground activities that may affect ocelots. In these cases, we assume the management action will not affect ocelots and that possible effects inadvertently overlooked at the programmatic level will be addressed by BLM in future implementation level consultations.

## **Overview of Potential Adverse Effects to Ocelots**

### Disturbance

Disturbance to ocelots may occur from both auditory and visual stimulus arising from multiple components of the action. Human presence (both pedestrians and vehicles), hunting dog and pet presence, lights, and noise are associated with many components of the action, including but not limited to Vegetation Management, Wildland Fire, Livestock Grazing, and Recreational and Travel Management. Disturbance to ocelots can result in behavioral changes, increased energetic expenditures, and interference with habitat use, including use of movement corridors, and movement patterns. These could lead to decreased dispersal opportunities; changes in home range size and location; increased inter- and intra-specific competition; increased difficulty meeting energetic needs; etc. Because ocelots are primarily nocturnal and crepuscular (i.e., active at night and dawn and dusk), activities that occur during dusk, night, and dawn are more likely to disturb ocelots when they are active. Daytime activities are less likely to disturb active ocelots, but could disturb resting ocelots if the activities are close to a den or resting location.

While disturbance can adversely affect ocelots, because ocelots are rare in Arizona and have never been documented within the SPRNCA, the potential for activities associated with the SPRNCA RMP to disturb ocelots is fairly low. Should ocelots be present in the SPRNCA, the degree of potential disturbance that each RMP component may have on ocelots would depend on various aspects of the action, including its spatial extent, location, timing, frequency, and duration. In general, larger (in size), longer (in duration), and/or more frequent projects are more likely to disturb ocelots resulting in adverse behavioral changes. Projects that are smaller, shorter, and/or less frequent are less likely to disturb ocelots. Furthermore, because ocelots are secretive animals that generally avoid areas of high human use and associated noise, infrastructure, and lights, project activities in more remote areas may have a greater chance disturbing ocelots compared to activities in areas with high baseline levels of human use.

It has been well documented that artificial illumination at night can result in a wide variety of effects on wildlife, including, but not limited to, changes in dispersal and movement patterns, behavior, and habitat use (Beir 1995, Longcore and Rich 2004). No permanent nighttime lighting is proposed as part of the SPRNCA RMP; however, we anticipate that nighttime lights will likely be associated with some components of the RMP, such as Recreation and Travel Management (e.g., headlights from vehicles at night; lights from campers). Because the RMP

does not provide information on nighttime lighting, a detailed analysis of the effects of nighttime lighting will not be included in this consultation. Future implementation-level projects that include nighttime lighting in potential ocelot habitat should be addressed by BLM in future consultations.

Noise impacts can affect wildlife in a number of ways, possibly causing, among other things, changes in breeding behaviors, home ranges size and location, and habitat use, activity, and foraging patterns; increased stress response; and possibly damaged hearing if the noise is loud enough (Pater et al. 2009, NoiseQuest 2013). Although no studies have been conducted that we are aware of that specifically examine the effects of noise on ocelots, because ocelots are known to be secretive animals, elevated noise levels may result in disturbance to ocelots. While the SPRNCA RMP does not provide details on which project components will result in possible noise impacts to ocelots, noise will be produced by many RMP activities, particularly Recreation (e.g., hunting with firearms, vehicle travel) and Travel Management. Therefore, future implementation-level projects that produce noise in potential ocelot habitat should be addressed by BLM in future consultations.

Because SPRNCA is managed in part for resource protection, extensive permanent lighting and frequent high levels of noise are not anticipated as part of the proposed action. As such, potential impacts to ocelots from lights and noise are likely to occur infrequently and in relatively small areas of the SPRNCA.

#### Direct Injury and Mortality

Direct injury or mortality of ocelots could occur from collisions with vehicles using the SPRNCA (i.e., BLM staff and BLM authorized vehicular use) or from hunting, particularly with dogs, as explained in the Recreation and Travel Management section below.

#### Habitat Impacts

Impacts to ocelot habitat may occur from multiple project components, including Vegetation Management, Livestock Grazing, and Recreational and Travel Management. Although habitat use patterns of ocelots in Arizona are not well known, based on recent ocelot detections, we anticipate that ocelots are most likely to use riparian and xeric riparian vegetation communities that occur in the SPRNCA. While it is possible that ocelots use upland areas (dominated by Chihuahuan desert scrub and semidesert grassland) in the SPRNCA, we expect they use this vegetation type less frequently (because of less dense cover) than riparian areas. Based on this, we anticipate that activities that could result in loss or modification of riparian areas will have the greatest potential to adversely affect ocelots. That said, proposed RMP activities are anticipated to result in only a small amount of loss (permanent and temporary) or modification of riparian habitat. Activities in grasslands that reduce cover, such as grazing, have the potential to impact ocelots by potentially making habitat less suitable for ocelot use. While some RMP activities may reduce or modify a small amount of potential ocelot habitat, overall, management of open space on the SPRNCA will benefit ocelots and their habitat and prey.

#### **Air Quality**

Management of air quality may have indirect beneficial effects on ocelot through the reduction of air pollutants, and is not anticipated to have adverse impacts on the species.

### **Soils and Watershed Management**

Overall, the soils and watershed management component of the RMP will be beneficial for ocelots; however, some activities associated with such management, particularly those in more remote areas of the SPRNCA, could result in adverse effects to the species.

The soils and watershed management goals and objectives aim to conserve, protect, and enhance watershed function and are therefore anticipated to contribute to the long-term persistence or improvement of riparian habitat. Additionally, proposed watershed and soils program projects should typically improve the function and physical condition of the vegetation and the soil in both upland and riparian habitats. Both riparian and upland habitat may be used by ocelots to move between mountain ranges or to establish a home range in the SPRNCA, particularly in more remote area such as San Pedro River south of the Charleston Bridge and lower Babocomari River.

Actions to control erosion on 5,040 acres and recharge enhancement on about 2,170 acres of ephemeral tributaries would likely improve watershed health, which should maintain or improve potential habitat for ocelots. However, because such actions may occur in close proximity to mesquite bosques that ocelots may use, human activities associated with erosion control and recharge enhancement may result in temporary disturbance to ocelots.

Dismantling or altering human-made structures (over 50 acres), such as agricultural dikes and berms, railroad grades, and ditches and diversions, to restore hydrological function, especially as it relates to recharge, would improve channel, floodplain, and riparian function in habitat that could support ocelots. Similarly, the modification of roads and trails adversely affecting watershed health and function would improve watershed conditions and therefore provide a net benefit for ocelots. That said, removal of structures and modification of roads and trails may result in temporary disturbance to ocelots.

Specific locations and acres to be treated at any one time in areas that could support ocelots would be determined during the project implementation planning process. In general, however, watershed treatments would be spread out over space and time, thus allowing ocelots to move to adjacent areas not undergoing treatment.

### **Water Management**

Water Management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. We anticipate water management actions will have beneficial effects on ocelots by conserving water for wildlife, including ocelots and their prey, and maintaining vegetation characteristics (cover) in riparian areas. That said, the continued private use of wells near Hereford may result in adverse effects to ocelots by decreasing surface flows, which may result in decreased drinking water availability, riparian vegetation (cover), and aquatic prey items such as fish, frogs, and tadpoles.

### **Vegetation Management: All Vegetation Communities**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should result in long-term beneficial effects to ocelots. Multiple vegetation management actions, however, may adversely affect ocelots. For example, vegetation treatments, such as use of biological controls (e.g., targeted livestock grazing, insects), herbicide, prescribed fire, and mechanical treatments to suppress, control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics, may disturb ocelot or alter their movement patterns. These treatments may also result in a temporary loss or reduction in vegetation, thus reducing its suitability for ocelots and their prey. Prescribed fire could directly injure or kill an ocelot, although this is not likely to occur as prescribed fire moves slowly on the landscape. Disturbance to ocelots as a result of these actions is anticipated to occur intermittently throughout the life of the RMP; however, overall, potential impacts from these treatments should be localized and short-lived and benefit ocelots and their prey in the long-term. Additionally, these treatments would be spread over time and space, thus allowing ocelot to move to adjacent areas not being treated. Maintenance of firebreaks may result in long-term reduction in cover, but firebreaks will still be permeable to ocelots (see the **Wildland Fire and Management** section below for further information on this RMP element).

Targeted livestock grazing would be used on a case-by-case basis to reduce fuel loads or control invasive species in small areas over short periods of time using electric fencing to contain livestock. If targeted livestock grazing occurs in occupied habitat, ocelot could be disturbed and vegetation could be temporarily altered. No plans are currently in place to use insects as a biological control. The use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation in food items, and loss or damage to habitat. Chemicals for spot treatment of vegetation, when applied as directed, would be used in such small quantities that there would likely be little to no toxic effects on ocelots and their prey (details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required. Implementation of conservation measures, such as selecting herbicides that have low toxicity to wildlife, should reduce the likelihood of impacts to ocelots and their prey.

About 27,460 acres of vegetation may be treated as part of this RMP element; this area includes private and state-administered land within the SPRNCA boundary. The estimates of acreage by specific treatment type, for all vegetation types are prescribed fire 17,070; mechanical 6,130; herbicide 11,040 (the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). The USFWS and BLM consulted on the effects to ocelot from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). The proposed action under the RMP is to continue prescribed fire as detailed in the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Biological Opinion. Therefore, the effects of prescribed fire will not be addressed in this RMP consultation. Most of these vegetation treatments would occur in the uplands and in



the long-term should indirectly benefit riparian vegetation, which is the most likely vegetation community to be used by ocelots on the SPRNCA. Specific locations and acres to be treated at any one time in areas that could support ocelots would be determined during the project implementation planning process. Most of the activities associated with managing riparian vegetation, however, would occur during the day, thus decreasing the possibility of disturbing ocelots, which are generally active at night, dawn, and dusk.

### **Vegetation Management Specific to Riparian and Wetland Areas**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and wetland vegetation management, which aims to maintain, restore, and improve the ecological function of riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to ocelots. By protecting and restoring sensitive wetland ecological sites, adjacent riparian and mesquite woodland habitat that may be used by ocelots and their prey, would be maintained or improved through wetland hydrological processes.

Multiple riparian and wetland vegetation management actions, however, may adversely affect ocelots. For example, vegetation treatments using prescribed fire, herbicide, and mechanical means may 1) disturb ocelots; 2) alter ocelot habitat use and movement patterns; and 3) result in a temporary modification or loss of vegetation thus reducing its suitability for ocelots and their prey. Prescribed burns could also directly injure or kill an ocelot, although this is not likely to occur if prescribed fire moves slowly on the landscape. These treatments would, however, be spread over time and space, thus allowing ocelot to move to adjacent areas not being treated. Vegetation treatments would, however, be spread over time and space, thus allowing ocelot to move to adjacent areas not being treated. Overall, potential impacts from these treatments should be localized and short-lived and benefit ocelots and their prey in the long-term. The effects of chemicals used for spot treatment are discussed above in **Vegetation Management: All Vegetation Communities**.

Specific locations and acres to be treated at any one time in areas that could support ocelots would be determined during the project implementation planning process. Most of the activities associated with managing riparian and wetland vegetation, however, would occur during the day, thus decreasing the possibility of disturbing ocelots, which are generally active at night, dawn, and dusk.

### **Vegetation Management Specific to Sandy Washes (Xeric Riparian)**

Overall, vegetation management related to sandy washes, which aims to maintain the functionality, variability, and extent of desert washes and the vegetation communities within these xeric riparian areas, should result in long-term beneficial effects to ocelot. By protecting and restoring desert washes, habitat that may be used by ocelots would be maintained or improved. The assessment and removal of any barriers to movement would likely have an additional beneficial effect on ocelot through improved ability to move throughout the basin. Any effects due to management activities would be similar to those described above in **Vegetation Management: All Vegetation Communities**.

### **Vegetation Management Specific to Upland Vegetation (Chihuahuan Desert Scrub and Grasslands)**

Overall, restoration of the ecological integrity of 40,310 acres of upland vegetation, primarily through development of the grassland component of the plant community, may benefit the species, as ocelots in Arizona have been documented in both semidesert grassland and Great Basin grassland. That said, reduction of mesquite shrubs has unknown consequences on ocelots. On one hand, the reduction of shrub cover could reduce cover used by ocelots, but on the other hand, the reduction of mesquite shrubs and restoration of sacaton grassland could be beneficial as these grasslands provides may also provide cover for the species and its prey.

Vegetation treatments using biological control, prescribed fire, herbicide, and mechanical means may 1) disturb ocelots; 2) alter ocelot habitat use and movement patterns; and 3) result in a temporary modification or loss of vegetation thus reducing its suitability for ocelots and their prey. Prescribed burns could also directly injure or kill an ocelot, although this is not likely to occur if prescribed fire moves slowly on the landscape. These treatments would, however, be spread over time and space, thus allowing ocelot to move to adjacent areas not being treated. Specific locations and acres to be treated at any one time in areas that could support ocelots would be determined during the project implementation planning process. Most of the activities associated with managing upland vegetation, however, would occur during the day, thus decreasing the possibility of disturbing ocelots, which are generally active at night, dawn, and dusk.

### **Fish, Wildlife, and Special Status Species**

This RMP element, including, managing for priority wildlife and supporting, maintaining, and restoring wildlife habitat and habitat connectivity is likely to benefit ocelots. For example, beaver populations would result in localized increases in the water table, which would promote long-term establishment of riparian vegetation in some areas. It would subsequently improve habitat conditions for a multitude of species, including potential ocelot prey. The dense vegetation around beaver ponds and riparian area in reaches that benefit from additional water would improve cover in areas, making it more suitable for ocelot use. Any new beaver management activities that may affect this species would require reinitiation of the consultation on the beaver reintroduction to SPRNCA completed in 1998 (#2-21-97-F097). Therefore, no additional analysis of effects related to beaver management in this consultation is required.

The protection of springs and associated vegetation for wildlife would benefit likely ocelots, in that springs provide cover, water, and shade, all of which are important components of ocelot habitat. No actions related to this RMP element are anticipated to result in significant adverse effects to ocelots; however, potential effects will be examined during the project implementation planning process.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210), and therefore, these effects will not be addressed in this RMP consultation.

Additionally, the conservation area will continue to have an estimated 610 acres of firebreaks, 580 acres of which are BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. The USFWS and BLM addressed the effects of these firebreaks in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion #02EAAZ00-2015-F-0431), and therefore, these effects will not be addressed in this RMP consultation.

### **Cultural Resources**

The cultural resources goals are to identify, preserve, and protect significant cultural resources to ensure that they are available for appropriate uses by present and future generations, for such purposes as research, education, and preservation of cultural heritage. Some cultural resource management actions could affect ocelots; for example, activities related to the stabilization and rehabilitation of cultural sites may occur in potential ocelot habitat and could therefore disturb ocelots. Because such activities would occur during the day, they will have less risk of disrupting ocelot movements and feeding (which primarily occur at dusk, night, and dawn), but could disturb resting ocelots should they occur in the area.

### **Native American Concerns**

The Native American Concerns goals are strengthening government-to-government relationships through increased coordination, increasing knowledge and documentation of Native American traditional cultural values and uses of the SPRNCA, and accommodating traditional cultural uses as consistent with laws, regulations, and authorities. Some management actions associated with these goals may result in some relatively minor effects to ocelots. For example, human presence associated with the collection of plants may result in a short-term (minutes to a few hours) disturbance on an infrequent basis over the life of the RMP. Because plant collection would occur during the day, the activity will have less risk of disrupting ocelot movements and feeding (which primarily occur at dusk, night, and dawn), but could disturb resting ocelots should they occur in the area.

### **Visual Resources**

No effects to ocelots are anticipated from management of visual resources.

### **Paleontological Resources**

No effects to ocelots are anticipated from management of paleontological resources.

### **Livestock Grazing**

The USFWS and BLM consulted on the effects to ocelot from livestock grazing on the four SPRNCA allotments through the consultation on the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414). The proposed action under the RMP is to continue grazing as detailed in the Gila District Grazing Program Biological Opinion. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation.

### **Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and education opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping,

wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to adversely impact ocelots, should they occur in the area, and their habitat. The educational component of recreation management is likely, however, to benefit ocelots by providing information to the public about species and resource conservation.

Human and pet (e.g., dogs) presence associated with recreational activities such as hiking or backpacking could disturb (visual and auditory) ocelots and cause them to avoid habitat and exhibit other behavioral responses. The areas of potential ocelot habitat that could be affected by recreation and associated human disturbance (noise) are estimated by the BLM at 605 acres of Fremont cottonwood-Goodding's willow habitat (riparian), including 17 access locations to the San Pedro River and one access location on the Babocomari River, and 3,440 acres of mesquite bosque habitat. These areas contain roads and trails that support recreational activity ranging from heavy (e.g., large groups birdwatching and hiking near the San Pedro House) to very light (e.g., backcountry hiking/camping, hunting and fishing). Heavy recreational use is more likely to result in disturbance to ocelot and could possibly preclude ocelot use of otherwise suitable habitat. For example, on the SPRNCA, ocelots are most likely to use riparian areas, which are also popular recreation spots, thus increasing the chance of human-ocelot interactions. Areas with lighter use, such as backcountry camping could result disturbance to ocelots. However, because about 50 permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), it is anticipated that potential disturbance of ocelots will occur infrequently. The chance that campers and ocelots will be at the same location at the same time is likely relatively low.

The potential development of campgrounds, recreation sites (1), and planned trails (4 miles) together would result in long-term surface disturbance of an estimated 12 acres. Most of these developments would occur in areas with high human visitation, away from areas that ocelots would typically use. Even if the 12 acres supported potential ocelot habitat, the impact to ocelot from this habitat loss or modification would likely be very minimal because the loss of 12 acres is very small in comparison to the amount of potential habitat supported by the SPRNCA.

Motorized travel is allowed within the SPRNCA and 175 total miles of roads (276 acres), including 1) 9 miles (14.2 acres) that are open to the public; 2) 6.6 miles (10.4 acres) that are open to the public through lease from the Arizona State Land Department (used to reach BLM roads and trailheads); and 3) 166 miles (262 acres) that are administrative use only (which have very low vehicle volume, and are used as foot trails by the public). There are 68 miles of non-motorized trails. Motorized vehicle use associated with recreation management could adversely affect ocelots through disturbing normal activity and killing or injuring them. Collisions with vehicles represent the largest known cause of ocelot deaths in south Texas and Arizona in recent history. In backcountry settings, where ocelots are more likely to occur, motorized travel will be limited to roads with a 25 mph speed limit (State law for unposted rural dirt roads). Assuming drivers abide by the speed limit, reduced speeds should minimize the risk of collisions with ocelots. No off-road vehicle travel is permitted for recreational or administrative purposes, thus minimal impacts to potential ocelot habitat are anticipated.

If new travel routes (vehicle routes and trails for pedestrian, equine, and bike use) in potential ocelot habitat are designated (as part of travel management), then adverse impacts to habitat may occur and additional vehicle routes could increase the risk of collision with ocelots. Conversely, if routes are decommissioned, potential impacts to ocelots and their habitat may be reduced. However, potential impacts should be minimized as BLM plans to consider species protection when planning for new routes. The effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

Noise and human activities associated with recreation and travel management could disturb ocelots and cause them to avoid areas with human use. Unpredictable noise is often perceived as a threat and can cause startle and flight responses, physiological stress, and displacement or habitat avoidance. Chronic and frequent noise inhibits the ability of wildlife to detect important sounds (Francis and Barber 2013). Both unpredictable and chronic noise will result from recreational (e.g., mowing trails) and travel management activities (e.g., motorized vehicle use) and continue as for the life of the RMP.

Noise from construction of recreation facilities will typically occur during the day and continue until construction ends. Recreation and travel routes are generally concentrated in a few areas, such as the San Pedro House visitor center and bridges, thus minimizing the area ocelots may avoid due to noise disturbance. Most recreation occurs during the day, thus decreasing the possibility of disturbing ocelots, which are generally active at night, dawn, and dusk.

Recreational hunting is allowed by BLM on the SPRNCA, although it is regulated by the State, and hunters may use dogs to hunt mountain lions. Dogs used in remote areas and riparian habitats would likely have an adverse effect on ocelots if treed or killed by dogs. Hunting activities, including walking through ocelot habitat with dogs, inadvertently baying or treeing an ocelot with dogs, and shooting in ocelot habitat may disturb ocelots. Of these, baying or treeing ocelots with dogs would likely have the greatest potential impact on ocelots. Ocelots have been treed by dogs several times in Arizona, however, it has not occurred on the SPRNCA. Should ocelots be treed or bayed in the SPRNCA, they would likely experience a stress response and could be prevented from feeding, breeding, and sheltering during the duration in which they were treed. This, however, should last only a short time as the hunters are required to follow AGFD hunting regulations which require hunters to: 1) stop pursuing an ocelot once they aware that they are in pursuit of one, 2) call dogs off immediately, and 3) allow the ocelot to leave the area and take all steps to not intentionally harass the animal. We do not anticipate that temporarily preventing male ocelots from feeding, breeding (should female ocelots occur in the area, which has not been documented), or sheltering would have severe consequences (i.e., lead to death), as they do not care for young. If females were to occur in the area and be treed, temporarily preventing them from feeding, breeding, and sheltering could be much more detrimental as they care for young (young left alone would be vulnerable to predation and starvation). Again, females and their young have not been recently documented in Arizona; however, they have been documented recently about 30 miles south of the SPRNCA. Therefore, it is possible that they could occur in the SPRNCA. After being treed or bayed, ocelots may temporarily continue to experience increased stress levels and alter their behavior, including avoiding the area in

which they were treed or bayed. Overall, possible disturbance to ocelots from hunters should be infrequent (as ocelots are rare) and temporary.

Occasional discharge of firearms by hunters represents a source of noise disturbance within the SPRNCA. However, noise from sporadic gunshots during hunting season is infrequent and of momentary occurrence and therefore, not likely to be a significant source of disturbance to ocelots. Ocelots could be unintentionally shot by hunters. The risk of this occurring could be minimized if hunters made aware through educational programs of the potential presence of ocelots.

Disturbed ground associated with recreational activities may be more susceptible to colonization by invasive nonnative plants. Nonnative species may out-compete native species and introduced grasses also carry fire better and burn hotter than native species, which could degrade potential ocelot habitat.

### **Lands and Realty**

Overall, this RMP element which includes managing lands to conserve their wildlife values, will likely benefit ocelots. For example, closing the area to commercial energy development should be beneficial to ocelots, as it would exclude activities associated with such development, which could destroy or modify habitat and disturb ocelots. Land acquisition of riparian or mesquite bosque habitat could also benefit ocelot by conserving potential habitat for the species. Some actions associated with Lands and Realty may adversely affect ocelots. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. The renewal and possible changes to these ROWs could disturb ocelots and impact potential ocelot habitat. The Charleston Road ROW utility corridor runs through cottonwood-dominated riparian habitat and the El Paso Gas Line and Tombstone Aqueduct cross riparian habitat, so possible changes made to their configuration could affect ocelot movement in in the riparian corridor. Potential impacts to ocelots could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations are and if they will be implemented, however. Furthermore, maintenance of and access to existing utilities and ROWs could result in disturbance to ocelots, however, these activities must be conducted in a manner that reduced impacts on SPRNCA resources. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such

leases and permit could result in disturbance to ocelots and modification of their habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects on ocelots from such activities will likely be minimal or avoided altogether.

### **Wild and Scenic Rivers**

The NWSRS goal is to preserve, protect, and enhance study river values on the SPRNCA. The management action to remediate hazardous material from abandoned mines could temporarily disturb ocelots should they be near the project site; however, the overall action would have a beneficial effect on ocelots reduction of direct exposure to contaminants or indirect exposure through the food chain.

### **CUMULATIVE EFFECTS — OCELOT**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect ocelots are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction, farming, livestock grazing, mining, off-highway vehicle use, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in fragmentation, loss, or degradation of ocelot habitat and disturbance to ocelots. For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss and fragmentation habitat, as well as increased human and pet presence and vehicular traffic that can disturb ocelots and directly injure or kill them. The control of livestock from adjacent ranches without BLM leases is an ongoing issue, especially on the San Pedro River and St. David Ciénega. This activity is likely to adversely affect ocelots, should they occur in the area, and their habitat. State-regulated hunting and trapping could result in the removal of beaver from the river. The loss of beaver would have an adverse impact on recharge, reducing wetland water levels and stream flows resulting in modifications to potential ocelot habitat.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur in the action area. These activities can also degrade ocelot habitat and disturb ocelots.

Furthermore, long-term drought and climate change are likely to result in impacts to water sources and vegetation that may be used by ocelots. Hotter, dryer conditions also lead to greater risk of severe fire that could kill or displace ocelots.

## **JEOPARDY ANALYSIS — OCELOT**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion – Ocelot**

After reviewing the current status of the ocelot, the environmental baseline for the action area, the effects of the proposed SRPNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the ocelot. No critical habitat has been designated for this species, therefore, none will be affected. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;
- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and



- Any future-project specific activities under the SPRNCA RMP that may affect the ocelot will receive additional Service review and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this programmatic biological opinion are based on full implementation of the project as presented in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT— OCELOT**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed action described above is a “framework programmatic action” as defined in 50 CFR 402.02. In accordance with 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for a framework that does not authorize future actions; incidental take resulting from any action subsequently authorized, funded, or carried out under the program will be addressed in subsequent section 7 consultation, as appropriate. This biological opinion provides a broad-scale examination of the proposed action’s potential impacts on ocelots, but we lack reasonable certainty of where, when, and how much incidental take may occur. Therefore, we have not quantified the amount and extent of incidental take that may result from the proposed action and have not exempted such take in this biological opinion.

### **CONSERVATION RECOMMENDATIONS — OCELOT**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the BLM support ocelot recovery through implementing and/or funding recovery actions for the ocelot as outlined in the Ocelot Recovery Plan and determined by the Ocelot Recovery Team.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

## **STATUS OF THE SPECIES—NORTHERN MEXICAN GARTERSNAKE**

### **Description, Legal Status, and Recovery Planning**

The northern Mexican gartersnake (NMGS or gartersnake), which reaches up to 44 inches total length, ranges in color from olive to olive-brown or olive-gray with three lighter-colored stripes that run the length of the body, the middle of which darkens towards the tail. It may occur with other native gartersnake species and can be difficult for people without specific expertise to identify because of its similarity of appearance to other native gartersnake species.

The northern Mexican gartersnake (*Thamnophis eques megalops*) was designated a threatened species under the Act on July 8, 2014 (79 FR 38678; July 8, 2014). Please refer to this rule for more in-depth information on the ecology and threats to the species, including references. Critical habitat was proposed on July 10, 2013 (78 FR 41500; July 10, 2013) and has not yet been designated. Details on proposed critical habitat are provided below. The final listing and proposed critical habitat rules are incorporated herein by reference. A recovery plan has not been developed for this species.

### **Life History and Habitat**

The northern Mexican gartersnake is an active predator and is thought to heavily depend upon a native prey base (Rosen and Schwalbe 1988). Northern Mexican gartersnakes forage along vegetated stream banks, searching for prey in water and on land, using different strategies (Alfaro 2002). Primarily, its diet consists of amphibians and fishes, such as adult and larval (tadpoles) native leopard frogs, as well as juvenile and adult native fish (Rosen and Schwalbe 1988). In situations where native prey species are rare or absent, this snake's diet may include non-native species, including larval and juvenile bullfrogs, western mosquitofish (Holycross et al. 2006, Emmons and Nowak 2013), or other non-native fishes. In northern Mexican gartersnake populations where the prey base is skewed heavily towards harmful non-native species, recruitment of gartersnakes is often diminished or nearly absent.

Throughout its rangewide distribution, the northern Mexican gartersnake occurs at elevations from 130 to 8,497 feet (Rossman et al. 1996) and is considered a “terrestrial-aquatic generalist” by Drummond and Marcías-García (1983). The northern Mexican gartersnake is often found in riparian habitat, but has also been found hiding under cover in grassland habitat up to a mile away from any surface water (Cogan 2015). The subspecies has historically been associated with three general habitat types: 1) source-area wetlands (e.g., Cienegas or stock tanks); 2) large river riparian woodlands and forests; and 3) streamside gallery forests (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988).

### **Distribution and Abundance**

The northern Mexican gartersnake was historically found within nearly every major watershed in Arizona (with the exception of the Little Colorado River watershed) and southwestern New

Mexico including the Colorado, Verde, Salt, San Pedro, and Gila watersheds, extending south along the Mexican Plateau to near Mexico City. Throughout its rangewide distribution, the northern Mexican gartersnake occurs at elevations from 140 to 8,497 ft (Rossman *et al.* 1996, p. 172) within a wide variety of biotic communities including Sonoran Desertscrub through Semidesert Grassland, Interior Chaparral, Madrean Evergreen Woodland, into the lower reaches of Petran Montane Conifer Forest (Brennan and Holycross 2006, p. 122). Within Mexico, northern Mexican gartersnakes historically occurred within the Sierra Madre Occidental and the Mexican Plateau, comprising approximately 85 percent of the total rangewide distribution of the subspecies (Rossman *et al.* 1996).

The only viable northern Mexican gartersnake populations in the United States where the subspecies remains reliably detected are all in Arizona: 1) the Page Springs and Bubbling Ponds State Fish Hatcheries along Oak Creek; 2) lower Tonto Creek; 3) the upper Santa Cruz River in the San Rafael Valley; 4) the Bill Williams River; and, 5) the middle/upper Verde River. In New Mexico and elsewhere in Arizona, the northern Mexican gartersnake may occur in extremely low population densities within its historical distribution; limited survey effort is inconclusive to determine extirpation of this highly secretive species. The status of the northern Mexican gartersnake on tribal lands, such as those owned by the White Mountain or San Carlos Apache Tribes, is poorly understood. Less is known about the current distribution of the northern Mexican gartersnake in Mexico due to limited surveys and limited access to information on survey efforts and field data from Mexico.

We have concluded that in as many as 23 of 33 known localities in the United States (70 percent), the northern Mexican gartersnake population is likely not viable and may exist at low population densities that could be threatened with extirpation or may already be extirpated (USFWS files). Only five populations of northern Mexican gartersnakes in the United States are considered likely viable where the species remains reliably detected.

### **Threats**

Natural predators of the northern Mexican gartersnake include birds of prey, other snakes, wading birds, mergansers, belted kingfishers, raccoons, skunks, and coyotes (Rosen and Schwalbe 1988, Brennan *et al.* 2009). Historically, large, highly predatory native fish species such as Colorado pikeminnow may have preyed upon northern Mexican gartersnakes where they co-occurred. Native chubs in their largest size class may also prey on neonatal gartersnakes, but this has not been confirmed in the literature or through field observation.

Harmful non-native species are a significant concern in almost every northern Mexican gartersnake locality in the United States and the most significant reason for their decline. Nonnative species can contribute to starvation of gartersnake populations through competitive mechanisms, and may reduce or eliminate recruitment of young gartersnakes through predation. Other threats include alteration of rivers and streams from dams, diversions, flood-control projects, and groundwater pumping that change flow regimes, reduce or eliminate habitat, and favor harmful non-native species; and effects from climate change and drought (79 FR 38678; July 8, 2014).

## ENVIRONMENTAL BASELINE—NORTHERN MEXICAN GARTERSNAKE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of the northern Mexican gartersnake analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above.

### **Status of the species within the action area**

#### *Life History and Habitat*

Life history of the northern Mexican gartersnake is described above in the Status of the Species. Gartersnake habitat on SPRNCA includes approximately 1,560 acres of wetlands and riparian areas and 7,510 acres of mesquite bosque plant communities.

#### *Distribution, Abundance, and Population Trends*

Northern Mexican gartersnakes have been documented along the San Pedro River from 1919 through 2018 at various locations, including Lewis Spring, at the Highway 90 crossing, near Hereford (Rosen and Schwalbe 1988; Rosen et al. 2001; Holycross et al. 2006), near Charleston (Corman 1988), and at the St. David Ciénega (Corman 1988). More recently the snake has been documented along the river near the San Pedro House and near the Babocomari River confluence (USFWS e-mail with Ohlenkamp and Miscione in 2018 and 2017, respectively).

Intensive formal surveys on the SPRNCA for NMGS using modern protocols are lacking. The known survey history in this area strictly involves the use of visual encounter techniques (not combined with the use of aquatic trapping arrays). The surveys took place in 1996, 1998, and 2000 at the Arizona State Highway 90 crossing; in 1998 at Lewis Springs; and in 1996 at Curtis Flat (USFWS files). Because aquatic snakes are very difficult to detect in surveys, NMGSs are assumed to be more abundant and widespread on the SPRNCA than the few verifiable reports would indicate.

#### *Threats*

Riparian and aquatic habitats that are essential for the survival of the NMGS are being negatively affected throughout the subspecies' range, including within the action area. Threats include water diversions, groundwater pumping, dams, channelization, and erosion. These are occurring

in both the U.S. and Mexico. They affect the amount of water in occupied habitat, directly affecting its suitability for NMGS.

Threats that alter the vegetation of occupied NMGS habitat are from development, roads, flood control and water diversion, improper livestock grazing, high-intensity wildfire, and undocumented immigration. Such threats have been documented throughout its range and in the action area. They reduce the habitat's suitability as cover for protection from predators, as a foraging area, and as a site for the gartersnake to effectively regulate its body temperature. Harmful nonnative species are the most significant threat to the subspecies (79 FR 38678; July 8, 2014).

#### *Past and Ongoing Federal Actions in the Action Area*

Within Arizona, 22 projects have undergone formal section 7 consultation for effects to NMGS, with several actions (e.g., vegetation treatments, resource management planning) occurring in the Upper San Pedro watershed (see the Arizona Ecological Services Office [section 7 website](#) for these consultations). Specifically within the SPRNCA, two projects with potential impacts to NMGS are ongoing:

- 1) Effects of tamarisk treatment on the SPRNCA was consulted on in 1995 (San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation #22410-2009-I-0195]), with reinitiation in 2018 (Reinitiation of San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation # 02EAAZ00-2018-F-1018]); and
- 2) Effects of livestock grazing on the four existing allotments on the SPRNCA was consulted on in 2012 (Biological Opinion on the Gila District Grazing Program, 22410-2006-F-0414), with reinitiation in 2018.

While the federal actions throughout the action area resulted in adverse effects to the species, consultations also included measures to reduce adverse effects on the taxon (such as only driving on designated open roads and not over-land) and resulted in non-jeopardy determinations.

#### *Summary of the Status of the Species in the Action Area*

The only viable northern Mexican gartersnake populations in the U.S. where the subspecies remains reliably detected are all in Arizona, although none of these are within the action area. Within the action area, NMGS have been documented periodically along the San Pedro River from 1919 through 2018, although formal surveys using modern protocols are lacking. The aggregate effects of predation by nonnative species, groundwater extraction and surface water diversions, erosion, and habitat loss are likely negatively impacting the species within the action area.

### **EFFECTS OF THE ACTION—NORTHERN MEXICAN GARTERSNAKE**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent

actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

We anticipate that the proposed action, the SPNRCA RMP, will result in net beneficial effects on northern Mexican gartersnakes by, among other actions, maintaining and managing for riparian and wildlife habitat. Overall, such management should provide opportunities for gartersnakes to use the SPNRCA on a long-term basis. That said, individual components of the SPNRCA RMP are likely to adversely affect gartersnakes; these effects are discussed in the RMP components' sections below.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on northern Mexican gartersnake in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level consultations. Furthermore, potential adverse effects associated with the RMP may be minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level. The aim of the analysis below is to point out activities in the RMP that may affect gartersnakes and discuss the general types of effects these activities may have on the species. In some cases, management actions lack detail (e.g., review and assess water needs for resources managed on the SPNRCA and acquire and perfect new water rights as deemed necessary for management) to understand if they have associated on-the-ground impacts that may affect NMGS. In these cases, we assume the management action will not affect gartersnakes and that possible effects inadvertently overlooked at the programmatic level will be addressed by BLM in future implementation level consultations.

### **Air Quality**

No effects to NMGS are likely from management of air quality.

### **Soil and Watershed Management**

Overall, the soils and watershed management component of the RMP will be beneficial for NMGS; however, some activities associated with some watershed treatments (e.g., modification of roads and trails, vegetation treatments, stream channel restoration treatments) may result in adverse effects to NMGS in areas where they occur.

The soils and watershed management goals and objectives aim to conserve, protect, and enhance watershed function and are therefore anticipated to contribute to the long-term persistence or improvement of riparian habitat. Additionally, proposed watershed and soils program projects should typically improve the function and physical condition of the vegetation and the soil in both upland and riparian habitats. Wetlands, riparian areas, associated aquatic habitat, and upland areas may be used by NMGS for life history functions such as denning, basking, and foraging.

Actions to control erosion on 5,040 acres and recharge enhancement on about 2,170 acres of ephemeral tributaries would likely improve watershed health and groundwater recharge, which

should maintain or improve habitat for NMGS. However, because such actions may occur within areas that NMGS may occupy, human activities associated with erosion control and recharge enhancement may result in temporary disturbance to NMGS through the loss of vegetation on banks and along streambeds.

Dismantling or altering human-made structures (over 50 acres), such as agricultural dikes and berms, railroad grades, and ditches and diversions, to restore hydrological function, especially as it relates to recharge, would improve channel, floodplain, and riparian function in NMGS habitat. Similarly, the modification of roads and trails adversely affecting watershed health and function would improve watershed conditions and therefore provide a net benefit for NMGS. That said, removal of structures and modification of roads and trails may result in temporary disturbance and possible injury to or mortality of NMGS if vehicles or heavy equipment are required.

Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with soil and watershed management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Water Management**

Water management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. We anticipate water management actions will have beneficial effects on NMGS by conserving water for wildlife, which directly affects habitat quality and long-term persistence of the species. That said, the private use of wells near Hereford may result in adverse effects to NMGS by decreasing surface flows, which may result in decreased herbaceous riparian vegetation (cover) and aquatic prey items such as fish, frogs, and tadpoles. Additionally, these private wells have supported two ponds that have harbored nonnative aquatic species in the past, including bullfrogs. The use of water for ponds that support bullfrogs and potentially predacious nonnative fishes would likely result in the injury and mortality of gartersnakes that try to use the habitat, resulting in an adverse effect to NMGS.

In addition, short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on NMGS habitat. As conditions indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS in order to reduce potential adverse effects that may become apparent once details of the activity are known; therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management: All Vegetation Communities**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should result in long-term beneficial effects to NMGS. Multiple vegetation management actions, however, may adversely affect NMGS. For example, vegetation treatments, such as use of biological controls (e.g., targeted livestock grazing, insects), herbicide, prescribed fire, and mechanical treatments (including use of heavy equipment) to suppress,

control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics, may disturb NMGS and result in a temporary loss or reduction in vegetation, increased sediment, and increased peak flows. This could reduce habitat suitability for NMGS until vegetation is reestablished on its own or by revegetation efforts. Individuals could be directly injured or killed during prescribed fire and mechanical treatment activities, if these activities occur in occupied areas. Disturbance to NMGS as a result of these actions is anticipated to occur intermittently throughout the life of the action and potentially could affect their movement and habitat use, although impacts from these treatments should be localized and short-lived. Maintenance of firebreaks may result in long-term reduction in potential habitat, but firebreaks should protect large tracts of riparian and mesquite bosque (including NMGS habitat) from loss due to wildfire (see the **Wildland Fire and Management** section below for further information on this RMP element).

Targeted livestock grazing would be used on a case-by-case basis to reduce fuel loads or control invasive species in small areas over short periods of time using electric fencing to contain livestock. If targeted livestock grazing occurs in occupied habitat, vegetation could be temporarily altered, thus disturbing individuals. No plans are currently in place to use insects as a biological control. The use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation in food items, and loss or damage to habitat. Chemicals for spot treatment of vegetation, when applied as directed, would be used in such small quantities that there would likely be little to no toxic effects on NMGS or its food sources (details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007)). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required. Implementation of conservation measures, such as selecting herbicides that have low toxicity to wildlife, should reduce the likelihood of impacts to NMGS and its habitat.

About 27,460 acres of vegetation may be treated as part of this RMP element; this area includes private and state-administered land within the SPRNCA boundary. The estimates of acreage by specific treatment type for all vegetation types are prescribed fire 17,070; mechanical 6,130; herbicide 11,040 (the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). The USFWS and BLM consulted on the effects to several species from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). NMGS were not listed at the time of consultation but will be addressed in a reinitiated consultation. In this consultation BLM committed to implementing conservation measures for various species including those with similar habitat needs (e.g., Chiricahua leopard frog); these will also be applied to NMGS and therefore, these effects will not be addressed in this RMP consultation. Most of these vegetation treatments would occur in the uplands and in the long-term should indirectly benefit riparian vegetation, and therefore would likely benefit NMGS on the SPRNCA by increasing important habitat and prey items.



Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management Specific to Riparian and Wetland Areas**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and wetland vegetation management, which aims to maintain, restore, and improve the ecological function of riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to NMGS. By protecting and restoring sensitive wetland ecological sites, adjacent riparian and upland habitat that may be used by NMGS would be maintained or improved through wetland hydrological processes.

Multiple riparian and wetland vegetation management actions, however, may adversely affect NMGS. For example, vegetation treatments may require the use of herbicide, prescribed fire, and mechanical treatments could cause a temporary loss or reduction in vegetation, increased sediment, and increased peak flows, which could reduce habitat suitability for NMGS until vegetation is reestablished on its own or by revegetation efforts. Additionally, individuals could be directly injured or killed during prescribed fire and mechanical treatment activities, if these activities occur in occupied areas. Disturbance to NMGS as a result of these actions is anticipated to occur intermittently throughout the life of the action and potentially could affect their movement and habitat use, although impacts from these treatments should be localized and short-lived. The effects of these treatments are discussed above in **Vegetation Management: All Vegetation Communities**. Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with riparian and wetland vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management Specific to Sandy Washes (Xeric Riparian)**

Overall, vegetation management related to sandy washes, which aims to maintain the functionality, variability, and extent of desert washes and the vegetation communities within these xeric riparian areas, should result in long-term beneficial effects to NMGS. By protecting and restoring desert washes, habitat that may be used by NMGS would be maintained or improved. Any effects due to management activities would be similar to those described above in **Vegetation Management: All Vegetation Communities**.

### **Vegetation Management Specific to Upland Vegetation Communities (Chihuahuan Desert Scrub and Grasslands)**

Overall, restoration of the ecological integrity of 40,310 acres of upland vegetation, primarily through development of the grassland component of the plant community, may benefit NMGS

by improving the quality of vegetation, including mesquite bosque areas that likely provide NMGS habitat. That said, some vegetation management for the restoration of abandoned farm fields using native plantings, seeding, heavy equipment, herbicide, prescribed fire, and biological control may occur in areas potentially occupied by NMGS. The discussion of effects on NMGS and habitat are the same as that in **Vegetation Management: All Vegetation Communities** above.

Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with upland vegetation communities management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Fish, Wildlife, and Special Status Species**

This RMP element, including managing for priority wildlife and supporting, maintaining, and restoring wildlife habitat and habitat connectivity, is likely to benefit NMGS. For example, the protection of springs and associated vegetation for wildlife would help maintain the integrity of NMGS habitat and foraging areas in the action area. Additionally, beaver populations would result in localized increases in the water table, which would promote long-term establishment of riparian vegetation and create ciénega-like habitat that benefits NMGS. Controlling invasive aquatic species would also benefit NMGS directly by reducing injury and mortality due to predation, and restoring and augmenting populations of NMGS and their native prey (i.e., Gila topminnow, desert pupfish, and native leopard frogs) would provide a substantial benefit to the species.

That said, some fish and wildlife activities in or near riparian or mesquite bosque habitat may have adverse effects on NMGS. For example, operations to remove nonnative aquatic species, such as aquatic traps if they are fully submerged, can kill NMGS where they co-occur with the targeted nonnatives. Other methods of removal, such as netting and electroshocking, are not expected to be fatal to NMGS. Channel restoration (including use of heavy equipment) could disturb and injure NMGS. Additionally, revegetation activities could result in a temporary loss of small patches of habitat until vegetation reestablishes.

Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with fish, wildlife, and special status species management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210). NMGS were not listed at the time of consultation but will be addressed in a

reinitiated consultation. In this consultation BLM committed to implementing conservation measures for various species including those with similar habitat needs (e.g., Chiricahua leopard frog); these will also be applied to NMGS and therefore, these effects will not be addressed in this RMP consultation.

Additionally, the conservation area will continue to have an estimated 610 acres of firebreaks, 580 acres of which are BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. The USFWS and BLM addressed the effects of these firebreaks in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion #02EAAZ00-2015-F-0431), and therefore, these effects will not be addressed in this RMP consultation.

### **Cultural Resources**

The cultural resources goals are to identify, preserve, and protect significant cultural resources to ensure that they are available for appropriate uses by present and future generations, for such purposes as research, education, and preservation of cultural heritage. Some cultural resource management actions could affect NMGS; for example, activities related to the stabilization and rehabilitation of cultural sites may occur in locations close enough to occupied NMGS habitat to affect individuals that use the sites for cover, gestation, or thermal regulation. However, overall, potential impacts from these activities should be localized and short-lived.

Specific locations and acres to be treated at any one time in areas that could support NMGS would be determined during the project implementation planning process. Potential adverse effects associated with fish, wildlife, and special status species management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as instituting avoidance areas and timing management activities); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Native American Concerns**

The Native American Concerns goals are strengthening government-to-government relationships through increased coordination, increasing knowledge and documentation of Native American traditional cultural values and uses of the SPRNCA, and accommodating traditional cultural uses as consistent with laws, regulations, and authorities. Some management actions associated with these goals may result in a short-term (minutes to a few hours) disturbance to NMGS on an infrequent basis over the life of the plan. The discussion of effects on NMGS due to disturbance are the same as that in the **Vegetation Management: All Vegetation Communities** section above.

### **Visual Resources**

No effects to NMGS are anticipated from management of visual resources.

### **Paleontological Resources**

No effects to NMGS are anticipated from management of paleontological resources.

### **Livestock Grazing**

The USFWS and BLM consulted on the effects to Federally listed species and designated critical habitat from livestock grazing on the four SPRNCA allotments in the Biological Opinion for the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414) in 2012. Because NMGS had not been listed and critical habitat had not been proposed at the time, this consultation has been reinitiated for NMGS and formal conference for proposed critical habitat within these four allotments. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation.

### **Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and educational opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Recreational activity ranges from heavy (e.g., large groups birdwatching and hiking near the San Pedro House) to very light (e.g., back country hiking, hunting and fishing off trail). Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to adversely impact NMGS and its habitat. The educational component of recreation management is likely, however, to benefit NMGS by providing information to the public about species and resource conservation.

Disturbance to NMGS from recreation and travel management activities may occur from human activity near or in occupied riparian or mesquite bosque habitats. Disturbance to NMGS where they breed, forage, or den can lead to short-term adverse effects until these activities are done. The area of NMGS habitat potentially affected by human activities is estimated by the BLM at 605 acres of Fremont cottonwood-Goodding's willow (riparian) habitat, including 17 access locations to the San Pedro River and one access location on the Babocomari River, and 3,440 acres of mesquite bosque habitat. Potential effects from the proposed action would typically occur during the day when projects or treatments take place, and would be intermittent throughout the day.

Motorized vehicle use associated with recreation and travel management has the potential to adversely affect NMGS through direct mortality. Motorized travel on roads can injure or kill NMGS that cross them. Vehicular collisions with snakes on roads is a common source of mortality, especially in seasons where snakes are very active. Motorized roads within the SPRNCA include 9 miles (14.2 acres) that are open to the public; 6.6 miles (10.4 acres) that are open to the public through lease from the Arizona State Land Department (used to reach BLM roads and trailheads); and 166 miles (262 acres) that are administrative use only (which have very low vehicle volume, and are used as foot trails by the public). There are 68 miles of non-motorized trails. Construction of recreational facilities and mowing to maintain trailhead areas and trail segments that are prone to vigorous grass and forb growth could have similar impacts to NMGS. Additionally, some activities, such as mowing, may injure or kill NMGS, although this risk may be limited due to the loud noise, ground vibration, and slow speed of the equipment (less than 2 mph). That said, Emmons and Nowak (2016) surmised that NMGS deaths may

increase from a variety of human activities, including reduced cover along mowed travel corridors, which increases predation. They found that NMGS use trails for thermal regulation and that trails were located near den sites in some cases. Disturbance from all of these activities (motorized travel, facility construction, and mowing) are expected to be infrequent and of short-term (less than 30 days) duration.

Dispersed recreation (e.g., backcountry camping, hunting, wood gathering, fishing), particularly along waterways, may result in disturbance to NMGS and could cause them to avoid small patches of habitat. Additionally, an increase in human-snake encounters can lead to an increase in snake mortality (Fleharty 1967, Rosen and Schwalbe 1988, Green 1997, Nowak and Santana-Bendix 2002, Hibbitts and Fitzgerald 2009). Because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. To accommodate such recreational interest in the SPRNCA, over the life of the RMP, access to the San Pedro River could be increased to 17 locations. All 17 locations have trails that are currently used, but 5 do not yet have trailhead development. Recreational activities may increase over time, and recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, such as Escapule and Hereford, although some dispersed recreation will also continue to occur. Disturbed ground associated with recreational activities may be more susceptible to colonization by invasive nonnative plants. Nonnative species may out-compete native species and introduced grasses also carry fire better and burn hotter than native species, which could degrade potential NMGS habitat. Some benefits to NMGS may be gained by catching nonnative fish, gathering crayfish, and hunting bullfrogs, which could reduce the number of these predatory nonnative species. Fishing generally reduces sportfish numbers and selects for larger size classes of fish, which anglers usually keep. Fewer than 50 backcountry permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), so adverse impacts to NMGS from backcountry camping will likely be infrequent and temporary. Additionally, NMGS are capable of moving a short distance if disturbed and resuming normal behavior patterns. In the future, numbers of backcountry users may increase, potentially resulting in more disturbance to and mortality of NMGS. Additionally, campers can start wildfires leading to damage to NMGS habitat. To reduce the potential for these impacts, the BLM will require the use of stoves in the backcountry, and in designated campsites will locate fire rings away from riparian areas, although they may be near mesquite bosques used by NMGS.

As part of travel management, about 202 miles on the SPRNCA route inventory (vehicle routes and trails for pedestrian, equine, and bike use) would be evaluated. If new travel routes in potential NMGS habitat are designated (as part of travel management), then adverse impacts to habitat may occur and additional vehicle routes could increase noise and the risk of injury or death of NMGS. Conversely, the decommissioning of travel routes will likely be beneficial for NMGS and its habitat. Development of trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in NMGS habitat, resulting in some level of additional adverse impacts similar to those discussed elsewhere in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA have not been determined. Potential impacts from travel management should be minimized as BLM plans to consider species protection when planning for new routes. The

effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

The potential development of campgrounds, recreation sites (1), and planned trails (4 miles) together would result in long-term surface disturbance of an estimated 12 acres. Adverse effects from human use of these developments may include compaction of soils, minor erosion and sedimentation into waterways, and reduced vegetation where trails are located and through some off-trail hiking. Recreational use on trails can cause them to become erosional features that could adversely affect NMGS riparian habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge. However, most of these developments would occur outside of NMGS habitat. Additionally, increased trail monitoring and maintenance could prevent these adverse effects to NMGS habitat. Site-specific effects of development would be determined during implementation planning and will be consulted on at that time.

### **Lands and Realty**

Overall, this RMP element, which includes managing lands to conserve their wildlife values, will likely benefit NMGS. For example, closing the area to commercial energy development should be beneficial to NMGS and its habitat, as it would exclude activities associated with such development, which could destroy or modify habitat and disturb NMGS. Land acquisition of riparian or mesquite bosque habitat could also benefit NMGS by conserving habitat for the species.

Some actions associated with Lands and Realty may adversely affect NMGS. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. The renewal and possible changes to these ROWs could disturb NMGS and impact its habitat. The Charleston Road ROW utility corridor runs through a perennial portion of the San Pedro River with riparian habitat, and the El Paso Gas Line and Tombstone Water Line cross riparian and wetland habitat, so possible changes made to their configuration could affect NMGS in the riparian corridor. Potential impacts to NMGS could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations would be and if they will be implemented, however. Furthermore, maintenance of and access to existing utilities and ROWs could result in disturbance, injury, and possible mortality of NMGS; however, these activities must be conducted in a manner that reduced impacts on SPRNCA resources. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in disturbance and potential injury to NMGS and modification of its habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects on NMGS from such activities will likely be minimal or avoided altogether.

### **Wild and Scenic Rivers**

The NWSRS goal is to preserve, protect, and enhance study river values on the SPRNCA. The management action to remediate hazardous material from abandoned mines could temporarily disturb NMGS should they be near the project site; however, the overall action would have a beneficial effect on NMGS by reducing direct exposure to contaminants or indirect exposure through the food chain.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect NMGS are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction, farming, livestock grazing, mining, off-highway vehicle use, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in fragmentation, loss, or degradation of NMGS habitat and disturbance to NMGS. For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss and fragmentation habitat, as well as increased human presence and vehicular traffic that can disturb NMGS and directly injure or kill them. The control of livestock from adjacent ranches without BLM leases is an ongoing issue, especially on the San Pedro River and St. David Ciénega. This activity is likely to adversely affect NMGS and their habitat. State-regulated hunting and trapping could result in the removal of beaver from the river. The loss of beaver would have an adverse impact on recharge, reducing wetland water levels and stream flows resulting in modifications to potential NMGS habitat.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur in the action area. These activities can also degrade NMGS habitat and disturb NMGS.

Furthermore, long-term drought and climate change are likely to result in impacts to water sources and vegetation used by NMGS. Hotter, dryer condition also lead to greater risk of severe fire that could kill or displace NMGS.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion**

After reviewing the current status of NMGS, the environmental baseline for the action area, the effects of the proposed SRPNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of NMGS. Per our discussions, we jointly determined that the proposed action would not adversely modify or destroy proposed critical habitat for the northern Mexican gartersnake. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;
- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and



- Any future-project specific activities under the SPRNCA RMP that may affect NMGS and its critical habitat will receive additional Service review and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this programmatic biological opinion are based on full implementation of the project as presented in the **Description of the Proposed Action** section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT— NMGS**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed action described above is a “framework programmatic action” as defined in 50 CFR 402.02. In accordance with 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for a framework that does not authorize future actions; incidental take resulting from any action subsequently authorized, funded, or carried out under the program will be addressed in subsequent section 7 consultation, as appropriate. This biological opinion provides a broad-scale examination of the proposed action’s potential impacts on NMGS, but we lack reasonable certainty of where, when, and how much incidental take may occur. Therefore, we have not quantified the amount and extent of incidental take that may result from the proposed action and have not exempted such take in this biological opinion.

### **CONSERVATION RECOMMENDATIONS — NMGS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the BLM support NMGS recovery through implementing and/or funding conservation actions, and, once a recovery plan or strategy is developed, implementing and/or funding recovery actions for NMGS at that time.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

## **STATUS OF THE SPECIES—SOUTHWESTERN WILLOW FLYCATCHER**

### **Description, Legal Status, and Recovery Planning**

The southwestern willow flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. The song is a sneezy “fitz-bew” or a “fit-a-bew,” the call is a repeated “whit.” It is one of four currently recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). It is a neotropical migrant that breeds in the southwestern U.S. and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (Phillips 1948, Stiles and Skutch 1989, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995). The historical breeding range of the southwestern willow flycatcher included southern California (CA), AZ, New Mexico (NM), western Texas (TX), southwestern Colorado (CO), southern Utah (UT), extreme southern Nevada (NV), and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (USFWS 1995). Current critical habitat was finalized on January 3, 2013, designating approximately 1,227 stream miles as critical habitat, with the lateral extent including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas encompassing a total area of approximately 208,973 acres. For a complete description of all previous Federal actions, see our critical habitat, correction notice to critical habitat, and current final critical habitat rules and notices published in the **Federal Register** (62 FR 39129, July 22, 1997; 70 FR 60886, October 19, 2005; 62 FR 44228, August 20, 1997; 78 FR 344, January 3, 2013), as well as our notice of 12-month petition findings (82 FR 61725, December 29, 2017). These documents are available on the [Arizona Ecological Services Office southwestern willow flycatcher website](#).

A final recovery plan for the southwestern willow flycatcher was signed by the USFWS Southwest Regional Director and released to the public in March, 2003 (USFWS 2002). The Plan describes the reasons for endangerment, current status of the flycatcher, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002).

The five-year review for the flycatcher was completed in August 2014 by the Arizona Ecological Services Office and is posted [Arizona Ecological Services Office southwestern willow flycatcher website](#).

### **Life History and Habitat**

The riparian patches used by breeding flycatchers vary in size and shape. They may be relatively dense, linear, contiguous stands or irregularly-shaped mosaics of dense vegetation with open

areas. According to the Recovery Plan (USFWS 2002), southwestern willow flycatchers nest in patches as small as 0.25 acre along the Rio Grande, and as large as 175 acres in the upper Gila River in New Mexico. Cardinal and Paxton (2005) found that home ranges of telemetered flycatchers at Roosevelt Lake, Arizona, varied from 0.37 to 890 acres. Mean patch size of breeding sites supporting 10 or more flycatcher territories was 62.2 acres, although aggregations of occupied patches within a breeding site may create a riparian mosaic as large as 494 acres or more (USFWS 2002). Flycatchers are generally not found nesting in confined floodplains where only a single narrow strip of riparian vegetation less than approximately 33 ft wide develops, although they may use such vegetation if it extends out from larger patches, and during migration (USFWS 2002).

Evidence gathered during multi-year studies of color-banded populations shows that although most southwestern willow flycatchers return to former breeding areas, flycatchers regularly move among sites within and between years (Netter et al. 1998, Kenwood and Paxton 2001, M. Whitfield unpubl. data). From 1997 through 2000, 66% to 78% of flycatchers known to have survived from one breeding season to the next returned to the same breeding site; conversely, 22% to 34% of returning birds moved to different sites (Luff et al. 2000). Both males and females move within and between sites, with males showing slightly greater site fidelity (Netter et al. 1998). Within-drainage movements are more common than between-drainage movements (Kenwood and Paxton 2001). Typical distances moved range from 2 to 30 km (1.2 - 18 mi); however, long-distance movements of up to 220 km have been observed on the lower Colorado River and Virgin River (McKernan and Braden 2001). In some cases, willow flycatchers are faced with situations that force movement, such as when catastrophic habitat loss occurs from fire or flood. Several such cases have been documented, with some of the resident willow flycatchers moving to remaining habitat within the breeding site, some moving to other sites 2 to 28 km (1.2 - 16.8 mi) away (Paxton et al. 1996, Owen and Sogge 1997), and others disappearing without being seen again.

The southwestern willow flycatcher breeds in dense riparian habitats from sea level in California to approximately 8,500 feet in AZ and southwestern CO. Historical egg/nest collections and species' descriptions throughout its range describe the southwestern willow flycatcher's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips et al. 1964, Hubbard 1987, Unitt 1987). Currently, southwestern willow flycatchers primarily use Geyer willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolio*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge et al. 1997).

The flycatcher's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in about four to five years; heavy runoff can remove/reduce habitat suitability in a day; or river channels, floodplain width,

location, and vegetation density may change over time. The flycatcher's use of habitat in different successional stages may also be dynamic. For example, over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial southwestern willow flycatchers (Cardinal and Paxton 2005, McLeod et al. 2005). Flycatcher habitat can quickly change and vary in suitability, location, use, and occupancy over time (Finch and Stoleson 2000).

Tamarisk is an important component of the flycatcher's nesting and foraging habitat in the central part of the flycatcher's breeding range in AZ, southern NV and UT, and western NM. In 2001 in AZ, 323 of the 404 (80 percent) known flycatcher nests (in 346 territories) were built in a tamarisk tree (Smith et al. 2002). Tamarisk had been believed by some to be a habitat type of lesser quality for the southwestern willow flycatcher; however, comparisons of reproductive performance (USFWS 2002), prey populations (Durst 2004) and physiological conditions (Owen and Sogge 2002) of flycatchers breeding in native and exotic vegetation has revealed no difference (Sogge et al. 2005).

The introduced tamarisk leaf beetle was first detected defoliating tamarisk within the range of the southwestern willow flycatcher in 2008 along the Virgin River in St. George, Utah. Initially, this insect was not believed to be able to move into or survive within the southwestern United States in the breeding range of the flycatcher. Along this Virgin River site in 2009, 13 of 15 flycatcher nests failed following vegetation defoliation (Paxton et al. 2010). As of 2012, the beetle has been found in southern NV/UT and northern AZ/NM within the flycatcher's breeding range. It was detected along the Colorado River below Hoover Dam in 2012. In 2017, the beetle was found farther into central AZ, with detections in western AZ along the Bill Williams, Santa Maria, and Big Sandy River, and in Maricopa County along the Hassayampa River. In NM, the beetle has traveled south along the Rio Grande from Colorado and north from releases in TX. By 2016, the beetle had been found throughout the length of the Rio Grande in NM, in particular at the densest population of breeding flycatchers at Elephant Butte Reservoir. Because tamarisk is a component of about 50 percent of all known flycatcher territories (Durst et al. 2008), continued spread of the beetle has the potential to significantly alter the distribution, abundance, and quality of flycatcher nesting habitat and impact breeding attempts.

### **Distribution and Abundance**

There are 288 known southwestern willow flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 2007 where a territorial flycatcher has been detected) holding an estimated 1,299 territories (Durst et al. 2008). It is difficult to arrive at a grand total of flycatcher territories since not all sites are surveyed annually. Numbers have increased since the bird was listed and some habitat remains unsurveyed; however, after nearly a decade of intense surveys, the existing numbers are just past the upper end of Unitt's (1987) estimate of 20 years ago (500-1000 pairs). About 50 percent of the 1,299 estimated territories (Table SWFL-1) throughout the subspecies range are located at four general locations (Cliff/Gila Valley – New Mexico, Roosevelt Lake – Arizona, San Pedro River/Gila River confluence – Arizona, Middle Rio Grande – New Mexico).

<p>Table SWFL-1. Estimated rangewide population for the SWFL based on 1993 to 2007 survey data for Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas<sup>1</sup>.</p>
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State	Number of sites with WIFL territories 1993-07 <sup>2</sup>	Percentage of sites with WIFL territories 1993-07	Number of territories <sup>3</sup>	Percentage of total territories
Arizona	124	43.1 %	459	35.3 %
California	96	33.3 %	172	13.2 %
Colorado	11	3.8 %	66	5.1 %
Nevada	13	4.5 %	76	5.9 %
New Mexico	41	14.2 %	519	40.0 %
Utah	3	1.0 %	7	0.5%
Texas	?	?	?	?
Total	288	100 %	1,299	100 %

<sup>1</sup>Durst et al. 2008.  
<sup>2</sup>Site boundaries are not defined uniformly throughout the bird's range.  
<sup>3</sup> Total territory numbers recorded are based upon the most recent year's survey information from that site between 1993 and 2007.

### Arizona Distribution and Abundance

While numbers have significantly increased in AZ (145 to 459 territories from 1996 to 2007) (English et al. 2006, Durst et al. 2008), overall distribution of flycatchers throughout the state has not changed much. Currently, population stability in AZ is believed to be largely dependent on the presence of three population centers (Roosevelt Lake, San Pedro/Gila River confluence, upper Gila River). Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the bird. Conversely, expansion into new habitats or discovery of other populations would improve the known stability and status of the flycatcher.

### Threats

Reasons for decline have been attributed to primarily loss, modification, and fragmentation of riparian breeding habitat, along with a host of other factors including loss of wintering habitat and brood parasitism by the brown-headed cowbird (Sogge et al. 1997, McCarthey et al. 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and excessive livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton et al. 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge et al. 1997). Willow flycatcher nests can be parasitized by brown-headed cowbirds (*Molothrus ater*), which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas. When these feeding areas are in close proximity to flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher nests may increase (Tibbitts et al. 1994).

Activities continue to adversely affect the distribution and extent of all stages of flycatcher habitat throughout its range (development, urbanization, grazing, recreation, native and non-

native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.). Introduced tamarisk-eating leaf beetles were not anticipated to persist within the range of the southwestern willow flycatcher. However, they were detected within the breeding habitat (and designated critical habitat) of the flycatcher in 2008 along the Virgin River near the Town of St. George, UT. In 2009, beetles were also known to have been detected defoliating habitat within the range of flycatcher habitat in southern Nevada, and along the Colorado River in the Grand Canyon and near Shiprock in AZ. As of 2017, leaf beetles had spread to the only known breeding sites along the lower Colorado River in AZ, along the Hassayampa River in Maricopa County, and at the largest flycatcher breeding population rangewide along the Middle Rio Grande at Elephant Butte, NM. Stochastic events also continue to change the distribution, quality, and extent of flycatcher habitat.

### **Planning and Conservation Efforts**

Conservation measures associated with some ESA section 7 consultations and section 10 Habitat Conservation Plans have helped to acquire lands specifically for flycatchers on the San Pedro, Verde, and Gila rivers in AZ and the Kern River in CA. Additionally, along the lower Colorado River, the U.S. Bureau of Reclamation is currently attempting to establish riparian vegetation to expand and improve the distribution and abundance of nesting flycatchers. A variety of Tribal Management Plans in CA, AZ, and NM have been established to guide conservation of the flycatchers. Additionally, during the development of the critical habitat rule, management plans were developed for some private lands along the Owens River in CA and Gila River in NM. These conservation actions are just a portion of those that have been established across the subspecies' range.

## **ENVIRONMENTAL BASELINE—SOUTHWESTERN WILLOW FLYCATCHER**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of the SWFL analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above. The proposed action falls within the Gila Recovery Unit as defined in the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002).

### **Status of the species within the action area**

### *Life History and Habitat*

Life history of the southwestern willow flycatcher is described above in the Status of the Species. Approximately 1,560 acres of riparian plant communities exist on the SPRNCA, much of which is likely suitable for SWFL or has the potential to become suitable over the life of the plan. Habitat within and around the action area includes riparian woodlands containing varying areal extents of riparian vegetation. Riparian woodlands extend continuously downstream of the international border along the San Pedro River for many miles and have the spatial extent, canopy closure (80 percent), and structural development of flycatcher breeding and foraging habitat. Only the northernmost reach of the SPRNCA is dominated by tamarisk, although Fremont cottonwood and Goodding's willow are present in the area. Inland areas have varying coverage of velvet mesquite. Reaches along the San Pedro River exhibit similar habitat, though there is a larger proportion of cottonwood/willow forest and mesquite bosque, likely owing to the San Pedro's more intact hydrology (i.e., no influence from an upstream dam). Flycatchers usually nest in willows within mixed willow/cottonwood stands, but will also nest in tamarisk (USBR 2013, as cited in the May 2019 Biological Assessment).

Recent USFWS guidance on consultations involving the SWFL cautions that habitats containing tamarisk should not be overlooked as potential flycatcher breeding habitat (USFWS 2016). In Arizona and New Mexico, the SWFL breeds in mixed native/tamarisk habitat, and tamarisk contribute toward cover, temperature amelioration, increased humidity, and insect production where native habitat has been compromised by altered hydrology. In some areas, if tamarisk is removed, the remaining more exposed, hotter, and drier SWFL habitat may be rendered unsuitable. For example, on the Rio Grande in New Mexico, a dense understory comprised of tamarisk, Russian olive, or native vegetation (e.g., willow) appears to be an important component for territory establishment (Sechrist et al. 2009). Flycatchers have been found breeding in monotypic tamarisk habitat in Arizona, but in some areas, in particular several reaches of the Gila River, flycatchers have been found breeding in tamarisk-dominated habitat. The draft USFWS consultation guidance (USFWS 2016) also points out that the flycatcher's foraging may extend into the uplands adjacent to currently suitable breeding habitat and may vary in species composition and density.

Habitat needs during migration are not well understood; however, they appear to include a relatively wide variety of conditions. Migrating flycatchers have been found in coastal scrub, second-growth forests and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding. They have been documented on SPRNCA during migration (Appendix B of the May 2019 Biological Assessment).

### *Distribution*

The San Pedro River has the largest population of SWFL in Arizona and one of the largest in the nation (USFWS 2014). The Gila River also contains an important population of western SWFL in both New Mexico and Arizona. The SWFL occurs along the reaches of the San Pedro and Gila Rivers within the action area (AZGFD 2011, p. 4). These birds occupy stringers of Fremont cottonwood (*Populus fremontii*)/Goodding's willow (*Salix gooddingii*) along the rivers' edges.

The Arizona Breeding Bird Atlas indicates confirmed SWFL breeding along the upper San Pedro River (Corman and Wise-Gervais 2005). The BLM-operated Monitoring Avian Productivity and

Survivorship (MAPS) bird banding studies provide records of SWFL observations along the San Pedro River between the international border and the community of St David; a couple of detections over the last 20 years were during the breeding season. Data from recent SWFL surveys on the SPRNCA are summarized in Appendix B of the May 2019 Biological Assessment.

### *Threats*

Declining SWFL numbers have been attributed to loss, modification, and fragmentation of riparian breeding habitat; loss of wintering habitat; and brood parasitism by the brown-headed cowbird. Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development; water diversion and groundwater pumping; channelization; dams; and livestock grazing. Fire is an increasing threat to willow flycatcher habitat, especially in monotypic saltcedar vegetation and where water diversions and/or groundwater pumping desiccates riparian vegetation (USFWS 2013, BLM files).

### *Past and Ongoing Federal Actions in the Action Area*

Within Arizona, 145 projects have undergone formal section 7 consultation for effects to SWFL, with many actions (e.g., fuels reduction, vegetation treatments, resource management planning) occurring in the Upper San Pedro watershed (see the Arizona Ecological Services Office [section 7 website](#) for these consultations). Specifically within the SPRNCA, two projects with potential impacts to SWFL are ongoing:

- 3) Effects of tamarisk treatment on the SPRNCA was consulted on in 1995 (San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation #22410-2009-I-0195]), with reinitiation in 2018 (Reinitiation of San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation # 02EAAZ00-2018-F-1018]); and
- 4) Effects of livestock grazing on the four existing allotments on the SPRNCA was consulted on in 2012 (Biological Opinion on the Gila District Grazing Program, 22410-2006-F-0414), with reinitiation in 2018.

While the federal actions throughout the action area resulted in adverse effects to the species, the consultations also included measures to reduce adverse effects on the taxon (such as avoiding actions during the breeding season) and resulted in non-jeopardy determinations.

### *Summary of the Status of the Species in the Action Area*

Historically, willow flycatchers ranged along most major rivers and streams in Arizona. The species' habitat has been altered by grazing, water diversion, exotic plant introduction, groundwater pumping, urban expansion, conversion of bottomlands to agriculture, and beaver elimination (USFWS 2002). The aggregate effects of habitat modification and loss, groundwater extraction and surface water diversions, stream channelization and stabilization, land conversion, wildfires, and brood parasitism by the brown-headed cowbird likely contribute to declining SWFL numbers.

## **EFFECTS OF THE ACTION—SOUTHWESTERN WILLOW FLYCATCHER**



Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

We anticipate that the proposed action, the SPNRCA RMP, will result in net beneficial effects on southwestern willow flycatcher by, among other actions, maintaining and managing for riparian and wildlife habitat. Overall, such management should provide opportunities for flycatchers to use the SPNRCA on a long-term (e.g., establish a home range) or short-term (e.g., use during migration) basis. That said, individual components of the SPNRCA RMP are likely to adversely affect SWFL; these effects are discussed in the RMP components' sections below.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on southwestern willow flycatchers in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level consultations. Furthermore, potential adverse effects associated with the RMP may be minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

The aim of the analysis below is to point out activities in the RMP that may affect flycatchers and discuss the general types of effects these activities may have on the species. In some cases, management actions lack detail (e.g., review and assess water needs for resources managed on the SPNRCA and acquire and perfect new water rights as deemed necessary for management) to understand if they have associated on-the-ground impacts that may affect SWFL. In these cases, we assume the management action will not affect flycatchers and that possible effects inadvertently overlooked at the programmatic level will be addressed by BLM in future implementation level consultations.

## **Overview of Potential Effects to Southwestern Willow Flycatcher**

### Disturbance

Disturbance to SWFL may occur from both auditory and visual stimulus arising from multiple components of the action. Human presence (both pedestrians and vehicles), hunting dog and pet presence, lights, and noise are associated with many components of the action, including but not limited to Vegetation Management, Wildland Fire, Livestock Grazing, and Recreational and Travel Management. Disturbance to SWFL can result in increased energetic expenditures due to increased movement rates and probabilities of flight response, habitat avoidance, and interference with habitat use, including during the breeding season. These could lead to decreased potential for reproduction, including destroyed nest sites, fledgling mortality, and abandonment of territories. Disturbance can also expose SWFL to increased predation.

The degree of potential disturbance that each RMP component may have on SWFL would depend on various aspects of the action, including its spatial extent, location, timing, frequency, and duration. In general, larger (in size), longer (in duration), and/or more frequent projects are more likely to disturb SWFL resulting in adverse behavioral changes. Projects that are smaller, shorter, and/or less frequent are less likely to disturb YBC.

#### Direct Injury and Mortality

Direct injury or mortality of SWFL could occur from collisions with vehicles using the SPRNCA (i.e., BLM staff and BLM authorized vehicular use).

#### Habitat Impacts

Impacts to SWFL habitat may occur from multiple project components, including Vegetation Management, Livestock Grazing, and Recreational and Travel Management. These would mainly be the result of livestock grazing infrastructure and construction of new recreation sites, campgrounds, and planned trails. Development of infrastructure and facilities would create areas of cleared vegetation, causing local habitat loss and fragmentation. That said, proposed RMP activities are anticipated to result in only a small amount of loss (permanent and temporary) or modification of SWFL habitat. While some RMP activities may reduce or modify a small amount of potential SWFL habitat, overall, management of open space on the SPRNCA will benefit SWFL and their habitat and foraging resources.

#### **Air Quality**

Management of air quality may have indirect beneficial effects on SWFL through the reduction of air pollutants, and is not anticipated to have adverse impacts on the species.

#### **Soil and Watershed Management**

Overall, the soils and watershed management component of the RMP will be beneficial for southwestern willow flycatchers; however, some activities associated with such management, particularly those in riparian habitat of the SPRNCA, could result in adverse effects to the species.

The soils and watershed management goals and objectives aim to conserve, protect, and enhance watershed function and are therefore anticipated to contribute to the long-term persistence or improvement of riparian habitat. Additionally, proposed watershed and soils program projects should typically improve the function and physical condition of the vegetation and the soil in riparian habitats. Riparian habitat is used by SWFL for breeding and foraging (including during migration) in the SPRNCA.

Actions to control erosion on 5,040 acres and recharge enhancement on about 2,170 acres of ephemeral tributaries would likely improve watershed health and groundwater recharge, which should maintain or improve habitat for SWFL. However, because such actions may occur within areas that SWFL may occupy, human activities associated with erosion control and recharge enhancement may result in temporary disturbance to SWFL through the loss of vegetation on banks and along streambeds.

Dismantling or altering human-made structures (over 50 acres), such as agricultural dikes and berms, railroad grades, and ditches and diversions, to restore hydrological function, especially as it relates to recharge, would improve channel, floodplain, and riparian function in SWFL habitat. Similarly, the modification of roads and trails adversely affecting watershed health and function would improve watershed conditions and therefore provide a net benefit for SWFL. That said, removal of structures and modification of roads and trails may result in temporary disturbance to SWFL.

Specific locations and acres to be treated at any one time in areas that could support southwestern willow flycatchers would be determined during the project implementation planning process. In general, however, watershed treatments would be spread out over space and time, thus allowing flycatchers to move to adjacent areas not undergoing treatment. Additionally, potential adverse effects associated with soil and watershed management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Water Management**

Water Management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. We anticipate water management actions will have beneficial effects by conserving water for wildlife, including SWFL and its habitat. That said, the private use of wells near Hereford may result in adverse effects to SWFL by decreasing surface flows, which may result in decreased herbaceous riparian vegetation and diminished SWFL habitat.

In addition, short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on SWFL habitat. As conditions indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS in order to reduce potential adverse effects that may become apparent once details of the activity are known; therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management: All Vegetation Communities**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should result in long-term beneficial effects to SWFL. Multiple vegetation management actions, however, may adversely affect SWFL. For example, vegetation treatments, such as use of biological controls (e.g., targeted livestock grazing, insects), herbicide, prescribed fire, and mechanical treatments to suppress, control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics, may disturb SWFL and result in a temporary loss or reduction in vegetation, reducing habitat suitability for SWFL. Individuals (particularly young before they fledge) could be directly injured or killed during prescribed fire and mechanical treatment activities, if these activities occur within the breeding season. Disturbance to SWFL as a result of these actions is anticipated to occur intermittently throughout the life of the action and potentially could affect their movement and habitat use, although impacts from these treatments should be localized and short-lived. Additionally, these treatments would be

spread out over space and time, thus allowing flycatchers to move to adjacent areas not undergoing treatment, and treatments would likely occur outside the breeding season, if possible. Maintenance of firebreaks may result in long-term reduction in potential habitat, but firebreaks should protect large tracts of riparian habitat (including SWFL habitat) from loss due to wildfire (see the **Wildland Fire and Management** section below for further information on this RMP element).

Targeted livestock grazing would be used on a case-by-case basis to reduce fuel loads or control invasive species in small areas over short periods of time using electric fencing to contain livestock. If targeted livestock grazing occurs in occupied habitat, SWFL could be disturbed and vegetation could be temporarily altered. No plans are currently in place to use insects as a biological control. The use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation in food items, and loss or damage to habitat. Chemicals for spot treatment of vegetation, when applied as directed, would be used in such small quantities that there would likely be little to no toxic effects on SWFL or its food sources (details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007)). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required. Implementation of conservation measures, such as selecting herbicides that have low toxicity to wildlife, should reduce the likelihood of impacts to SWFL and its habitat.

About 27,460 acres of vegetation may be treated as part of this RMP element; this area includes private and state-administered land within the SPRNCA boundary. The estimates of acreage by specific treatment type for all vegetation types are prescribed fire 17,070; mechanical 6,130; herbicide 11,040 (the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). The USFWS and BLM consulted on the effects to SWFL from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). The proposed action under the RMP is to continue prescribed fire as detailed in the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Biological Opinion. Therefore, the effects of prescribed fire will not be addressed in this RMP consultation. Most of these vegetation treatments would occur in the uplands and in the long-term should indirectly benefit riparian vegetation, thereby benefiting SWFL on the SPRNCA. Specific locations and acres to be treated at any one time in areas that could support SWFL would be determined during the project implementation planning process. Potential adverse effects associated with vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management Specific to Riparian and Wetland Areas**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and

wetland vegetation management, which aim to maintain, restore, and improve the ecological function of riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to SWFL. By protecting and restoring sensitive wetland ecological sites, adjacent riparian habitat that may be used by SWFL would be maintained or improved through wetland hydrological processes.

Multiple riparian and wetland vegetation management actions, however, may adversely affect SWFL. For example, vegetation treatments may require the use of herbicide, prescribed fire, and mechanical treatments to suppress, control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics. The effects of these treatments are discussed above in **Vegetation Management: All Vegetation Communities**.

Specific locations and acres to be treated at any one time in areas that could support SWFL would be determined during the project implementation planning process. Potential adverse effects associated with riparian and wetland vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

#### **Vegetation Management Specific to Sandy Washes (Xeric Riparian)**

No effects to SWFL are anticipated from management of sandy washes (xeric riparian areas).

#### **Vegetation Management Specific to Upland Vegetation Communities (Chihuahuan Desert Scrub and Grasslands)**

Overall, restoration of the ecological integrity of 40,310 acres of upland vegetation, primarily through development of the grassland component of the plant community, may improve the quality of vegetation for long-term benefit of wildlife habitat, including riparian habitat of SWFL. That said, some vegetation management for the restoration of abandoned farm fields using native plantings, seeding, heavy equipment, herbicide, prescribed fire, and biological control may occur in locations close enough to occupied SWFL habitat to disturb nesting or foraging birds. The discussion of effects on SWFL and habitat are the same as that in the **Vegetation Management: All Vegetation Communities** section above.

Specific locations and acres to be treated at any one time in areas that could support SWFL would be determined during the project implementation planning process. Potential adverse effects associated with upland vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

#### **Fish, Wildlife, and Special Status Species**

This RMP element, including managing for priority wildlife and supporting, maintaining, and restoring wildlife habitat and habitat connectivity, is likely to benefit SWFL. For example, the protection of springs and associated vegetation for wildlife would help maintain the integrity of small, local SWFL nesting and foraging sites. That said, some fish and wildlife activities in or near riparian or mesquite bosque habitat may have adverse effects on SWFL. For example,

disturbance could result from revegetation activities or through a temporary loss of small patches of habitat, until vegetation reestablishes and has suitable structural characteristics. The USFWS and BLM consulted on the potential effects to SWFL from the management of beaver populations, including augmentations, through the consultation on the Reintroduction of Beaver into the San Pedro Riparian Conservation Area (Biological Opinion #2-21-97-F097). Therefore, no additional analysis of the potential effects related to beaver management in this consultation is required.

Specific locations and acres to be treated at any one time in areas that could support SWFL would be determined during the project implementation planning process. Potential adverse effects associated with fish, wildlife, and special status species management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210), and therefore, these effects will not be addressed in this RMP consultation.

Additionally, the conservation area will continue to have an estimated 610 acres of firebreaks, 580 acres of which are BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. The USFWS and BLM addressed the effects of these firebreaks in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion #02EAAZ00-2015-F-0431), and therefore, these effects will not be addressed in this RMP consultation.

### **Cultural Resources**

The cultural resources goals are to identify, preserve, and protect significant cultural resources to ensure that they are available for appropriate uses by present and future generations, for such purposes as research, education, and preservation of cultural heritage. Some cultural resource management actions could affect SWFL; for example, activities related to the stabilization and rehabilitation of cultural sites may occur in locations close enough to occupied SWFL habitat to disturb nesting or foraging birds. However, overall, potential impacts from these activities should be localized and short-lived.

Specific locations for these activities in areas that could support SWFL would be determined during the project implementation planning process. Potential adverse effects associated with cultural resources could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (April 15 to September 15)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Native American Concerns**

The Native American Concerns goals are strengthening government-to-government relationships through increased coordination, increasing knowledge and documentation of Native American traditional cultural values and uses of the SPRNCA, and accommodating traditional cultural uses as consistent with laws, regulations, and authorities. Some management actions associated with these goals may result in a short-term (minutes to a few hours) disturbance to SWFL on an infrequent basis over the life of the plan. The discussion of effects on SWFL due to disturbance are the same as that in the **Vegetation Management: All Vegetation Communities** section above.

### **Visual Resources**

No effects to SWFL are anticipated from management of visual resources.

### **Paleontological Resources**

No effects to SWFL are anticipated from management of paleontological resources.

### **Livestock Grazing**

The USFWS and BLM consulted on the effects to Federally listed species and designated critical habitat from livestock grazing on the four SPRNCA allotments in the Biological Opinion for the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414) in 2012. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation.

### **Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and educational opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Recreational activity ranges from heavy (e.g., large groups birdwatching and hiking near the San Pedro House) to very light (e.g., back country hiking, hunting and fishing off trail). Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to adversely impact SWFL and its habitat. The educational component of recreation management is likely, however, to benefit SWFL by providing information to the public about species and resource conservation.

Disturbance to SWFL from recreation and travel management activities may occur from noise and human activities within occupied areas. Human presence associated with such activities as hiking or backpacking would likely disturb SWFL and could cause them to avoid habitat and exhibit other behavioral responses. The area of SWFL habitat potentially affected by noise and human activities is estimated at 605 acres of Fremont cottonwood-Goodding's willow (riparian) habitat. Unpredictable noise may be perceived as a threat by SWFL and may cause startling and flight responses, physiological stress, and displacement or habitat avoidance. Potential effects from the proposed action would typically occur during the day when projects or treatments take place, and would be intermittent throughout the day. Noise levels would depend on the type of equipment being used and effects would be related to the duration, intensity, and expanse of

recreation. Chronic and frequent noise inhibits the ability of wildlife to detect important sounds (Francis and Barber 2013). Chronic noise may result from such activities as motorized vehicle use and would continue as long as motorized routes are in use. Frequent noise from construction of recreation facilities would typically occur during the day and would continue until construction ends. Intermittent, short-term, and localized noise may result from non-motorized activities such as hiking, camping, and hunting.

Motorized vehicle use associated with recreation and travel management could adversely affect SWFL through noise disturbance as described above. Deaths of SWFL due to collisions with vehicles are possible, although unlikely, assuming drivers abide by the State imposed speed limit of 25 mph for unposted rural dirt roads. Additionally, no off-road vehicle travel is permitted, thus minimal impacts to SWFL habitat are anticipated. Motorized roads within the SPRNCA include 9 miles (14.2 acres) that are open to the public; 6.6 miles (10.4 acres) that are open to the public through lease from the Arizona State Land Department (used to reach BLM roads and trailheads); and 166 miles (262 acres) that are administrative use only (which have very low vehicle volume, and are used as foot trails by the public). There are 68 miles of non-motorized trails. Construction of recreational facilities and mowing to maintain trailhead areas and trail segments that are prone to vigorous grass and forb growth could have similar noise impacts to SWFL. However, noise disturbance from all of these activities (motorized travel, facility construction, and mowing) are expected to be infrequent and of short-term (less than 30 days) duration.

Dispersed recreation (e.g., backcountry camping, hunting, wood gathering) in more remote areas may result in some disturbance to SWFL, and because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. To accommodate such recreational interest in the SPRNCA, over the life of the RMP, access to the San Pedro River could be increased to 17 locations. All 17 locations have trails that are currently used, but 5 do not yet have trailhead development. Disturbed ground associated with recreational activities may be more susceptible to colonization by invasive nonnative plants. Nonnative species may out-compete native species and introduced grasses also carry fire better and burn hotter than native species, which could degrade potential SWFL habitat. While recreational activities may increase over time, recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, such as Escapule and Hereford, although some dispersed recreation will also continue to occur. Fewer than 50 backcountry permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), so adverse impacts to SWFL from backcountry camping will likely be infrequent and temporary. In the future, numbers of backcountry users may increase, potentially resulting in more disturbance to SWFL. Additionally, campers can start wildfires leading to damage to SWFL habitat. To reduce the potential for these impacts, the BLM will require the use of stoves in the backcountry, and in designated campsites will locate fire rings away from riparian areas, although they may be near mesquite bosques used by SWFL.

As part of travel management, about 202 miles on the SPRNCA route inventory (vehicle routes and trails for pedestrian, equine, and bike use) would be evaluated. If new travel routes in potential SWFL habitat are designated (as part of travel management), then adverse impacts to



habitat may occur and additional vehicle routes could increase noise and the risk of collision with SWFL. Conversely, the decommissioning of travel routes will likely be beneficial for SWFL and its habitat. Development of trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in SWFL habitat, resulting in some level of additional adverse impacts similar to those discussed elsewhere in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA have not been determined. Potential impacts from travel management should be minimized as BLM plans to consider species protection when planning for new routes. The effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

The potential development of campgrounds, recreation sites (1), and planned trails (4 miles) together would result in long-term surface disturbance of an estimated 12 acres. Adverse effects from human use of these developments may include compaction of soils, minor erosion and sedimentation into waterways, and reduced vegetation where trails are located and through some off-trail hiking. Recreational use on trails can cause them to become erosional features that could adversely affect SWFL riparian habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge. However, most of these developments would occur outside of SWFL habitat, and even if the 12 acres were in SWFL habitat, this represents a very minimal amount (less than 0.1 percent) of SWFL habitat available within the action area. Additionally, increased trail monitoring and maintenance could prevent these adverse effects to SWFL habitat. Site-specific effects of development would be determined during implementation planning and will be consulted on at that time.

### **Lands and Realty**

Overall, this RMP element, which includes managing lands to conserve their wildlife values, will likely benefit SWFL. For example, closing the area to commercial energy development should be beneficial to SWFL and its habitat, as it would exclude activities associated with such development, which could destroy or modify habitat and disturb SWFL. Land acquisition of riparian or mesquite bosque habitat could also benefit SWFL by conserving habitat for the species.

Some actions associated with Lands and Realty may adversely affect SWFL. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. The renewal and possible changes to these ROWs could disturb SWFL and impact its habitat. The Charleston Road ROW utility corridor runs through cottonwood-dominated riparian habitat, and the El Paso Gas Line and Tombstone Water Line cross riparian habitat, so possible changes made to their configuration could affect SWFL in the riparian corridor. Potential impacts to SWFL could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations would be and if they will be implemented, however. Furthermore, maintenance of and access to existing utilities and ROWs could result in disturbance to SWFL; however, these activities must be conducted in a manner that reduced impacts on SPRNCA resources. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in disturbance to SWFL and modification of its habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects on SWFL from such activities will likely be minimal or avoided altogether.

### **Wild and Scenic Rivers**

The NWSRS goal is to preserve, protect, and enhance study river values on the SPRNCA. The management action to remediate hazardous material from abandoned mines could temporarily disturb SWFL should they be near the project site; however, the overall action would have a beneficial effect on SWFL by reducing direct exposure to contaminants or indirect exposure through the food chain.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect SWFL are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction, farming, livestock grazing, mining, off-highway vehicle use, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in fragmentation, loss, or degradation of SWFL habitat and disturbance to SWFL. For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss and fragmentation habitat, as well as increased human presence and vehicular traffic that can disturb SWFL and directly injure or kill them. The control of livestock from adjacent ranches without BLM leases is an ongoing issue, especially on the San Pedro River and St. David Ciénega. This activity is likely to adversely affect SWFL and their habitat. State-regulated hunting and trapping could result in the removal of beaver from the river. The

loss of beaver would have an adverse impact on recharge, reducing wetland water levels and stream flows resulting in modifications to potential SWFL habitat.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur in the action area. These activities can also degrade SWFL habitat and disturb SWFL.

Furthermore, long-term drought and climate change are likely to result in impacts to water sources and vegetation used by SWFL. Hotter, dryer condition also lead to greater risk of severe fire that could kill or displace SWFL.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion**

After reviewing the current status of SWFL, the environmental baseline for the action area, the effects of the proposed SRPNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of SWFL. No critical habitat will be affected by this project. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;
- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and
- Any future-project specific activities under the SPRNCA RMP that may affect SWFL will receive additional Service review and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this programmatic biological opinion are based on full implementation of the project as presented in the **Description of the Proposed Action** section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT— SWFL**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed action described above is a “framework programmatic action” as defined in 50 CFR 402.02. In accordance with 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for a framework that does not authorize future actions; incidental take resulting from any action subsequently authorized, funded, or carried out under the program will be addressed in subsequent section 7 consultation, as appropriate. This biological opinion provides a broad-scale examination of the proposed action’s potential impacts on SWFL, but we lack reasonable certainty of where, when, and how much incidental take may occur. Therefore, we have not quantified the amount and extent of incidental take that may result from the proposed action and have not exempted such take in this biological opinion.

### **CONSERVATION RECOMMENDATIONS — SWFL**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to

minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the BLM support SWFL recovery through implementing and/or funding recovery actions for the SWFL as outlined in the Southwestern Willow Flycatcher Final Recovery Plan and determined by the Southwestern Willow Flycatcher Recovery Team.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

## **STATUS OF THE SPECIES—WESTERN YELLOW-BILLED CUCKOO**

### **Description, Legal Status, and Recovery Planning**

Adult yellow-billed cuckoos have moderate to heavy bills, somewhat elongated bodies and a narrow yellow ring of colored bare skin around the eye. The plumage is grayish-brown above and white below, with reddish primary flight feathers. The tail feathers are boldly patterned with black and white below. They are medium-sized birds about 12 inches in length, and about 2 ounces in weight. Males and females differ slightly; the males have a slightly smaller body size, smaller bill, and the white portions of the tail tend to form distinct oval spots. In females the white spots are less distinct and tend to be connected (Hughes 1999).

Morphologically, the yellow-billed cuckoos throughout the western continental United States and Mexico are generally larger, with significantly longer wings, longer tails, and longer and deeper bills (Franzreb and Laymon 1993) than cuckoos in the eastern part of the continent. Birds with these characteristics occupy the Distinct Population Segment (DPS) and we refer to them as the “western yellow-billed cuckoo.” Yellow-billed cuckoos in the west arrive on the breeding grounds 4 to 8 weeks later than eastern yellow-billed cuckoos at similar latitude (Franzreb and Laymon 1993, Hughes 1999).

The western DPS of the yellow-billed cuckoo was listed as a threatened species under the ESA on October 3, 2014 (79 FR 59992). Within the DPS (see Figure 1 at 79 FR 59994, in the final listing rule (79 FR 59992; October 3, 2014)), the habitat areas used by the species for nesting are located from southern British Columbia, Canada, to southern Sinaloa, Mexico, and may occur from sea level to 7,000 feet (ft) (2,154 meters (m)) in elevation (or slightly higher in western Colorado, Utah, and Wyoming). Critical habitat for the yellow-billed cuckoo DPS was proposed on August 15, encompassing 546,335 acres (ac) (221,094 hectares (ha)) across the western United States (USFWS 2014a; 79 FR 48548). The discussions of the status of this species in these documents are incorporated herein by reference. A revised proposed rule that may include additional proposed critical habitat is under development.

As of the date of this BO, a recovery plan for the yellow-billed cuckoo has not been developed.

### **Life History and Habitat**

Primarily a riparian species, YBC can be found in low- to moderate-elevation native forests lining the rivers and streams of the western U.S., although it also has also been found in xero-riparian woodlands, Madrean evergreen woodland drainages, and mesquite woodlands of arid areas of the Southwest. Much of its historical riparian habitat has been lost, altered, or degraded (Governor's Riparian Habitat Task Force 1990; Ohmart 1994). Most riparian habitats in the Southwest have been fundamentally altered by a century or more of urban and agricultural development, water diversions, dam building, groundwater pumping, livestock grazing, and other human disturbances.

In the past, riparian habitats occupied by cuckoos were by their nature dynamic and governed primarily by floods and flow patterns. Historically, cuckoos depended on natural flood cycles to generate the riparian woodlands and galleries it used for nesting, and to recycle old habitats as they grew out of suitability. Periodic flooding allowed the deposition of moist sediments and regeneration of native riparian species (i.e., willows and cottonwoods).

At the landscape level, the available information suggests the western yellow-billed cuckoo requires large tracts of willow-cottonwood, mesquite forest, or Madrean evergreen woodland for their nesting season habitat. Site-specific variation is likely a result of characteristics unique to each location (e.g., types and quality of habitat, configuration of patch), and flexible home ranges with overlapping territories in this weakly territorial species (Hughes 1999; Halterman 2009; Sechrist et al. 2013). Habitat can be relatively dense, contiguous stands, irregularly shaped mosaics of dense vegetation with open areas, narrow and linear, or savannah-like. The association of breeding with large tracts of suitable riparian habitat is likely related to home range size. Rangelwide, individual home ranges during the breeding season average over 100 ac (40 hectares) (Laymon and Halterman 1987b, Halterman 2009, McNeil et al. 2013, Sechrist et al. 2013).

In studies in Arizona and New Mexico, home ranges of cuckoos fitted with radio-telemetry varied between sites and between individual birds (Table YBC-1; Halterman 2009, McNeil et al. 2013, Sechrist et al. 2013). Home ranges of these three studies averaged between 49 ac (20 ha) and 153 ac (62 ha). Based on the available information, foraging likely occurs within 0.5 miles from the breeding location. A cuckoo's home range is often irregular (e.g., not circular), and may encompass only part of a 0.5 mile radius from the breeding location. A portion of the vegetation within the home range may be unsuitable for nesting, but may support large insects, frogs, or lizards for foraging. The amount of non-riparian foraging habitat cuckoos use may exceed the amount of riparian habitat they use; this is a function of home ranges including larger acreages of upland habitat relative to the riparian habitat present only near waterways and other sites with shallow groundwater. Breeding cuckoos occupy overlapping home ranges, exhibit little territoriality, and have flexible home ranges. Cuckoos may shift use areas within home their ranges during a season, perhaps in response resource availability or nesting habitat.

Table YBC-1. Average western yellow-billed cuckoo home range derived from three studies in Arizona and New Mexico using telemetered birds. Home range size varied greatly with the individual bird and habitat. Home range size has not been studied in more sparsely vegetated riparian habitat or in Madrean evergreen woodland drainages in the Southwest.

Location	Home Range 95% KDE ac (ha)	St Dev ac (ha)	Source
Rio Grande NM (n=13)	153 (62)	± 143 (58)	Sechrist et al. 2013
San Pedro River National Conservation Area AZ (upper San Pedro R) (n=28)	96 (39)	± 104 (42)	Halterman 2009
Lower Colorado River AZ (n=43)	49 (20)	±22 (9)	McNeil et al. 2013

### *Breeding Habitat*

The western yellow-billed cuckoo breeds in riparian (hydro- and xero- riparian) woodlands, and in Madrean evergreen woodland drainages and mesquite woodlands of arid areas. Habitat conditions are typically cooler and more humid than in the surrounding environment (USFWS 2014a, b). The vegetation making up the breeding habitat of the western yellow-billed cuckoo varies across the species' range and includes native and nonnative-riparian and upland nonriparian species including cottonwood (*Populus* spp.), willow (*Salix* spp.), mesquite (*Prosopis* spp.), box elder (*Acer negundo*), sycamore (*Platanus* spp.), ash (*Fraxinus* ssp.), walnut (*Juglans* spp.), alder (*Alnus* spp.), hackberry (*Celtis* spp.), soapberry (*Sapindus saponaria*), oak (*Quercus* spp.), acacia (*Acacia* spp.), desert willow (*Chilopsis linearis*), elderberry (*Sambucus mexicanus*), juniper (*Juniperus* spp.), pine (*Pinus* spp.), Russian olive (*Elaeagnus angustifolia*), and tamarisk (*Tamarix* spp.) (Gaines 1974, Gaines and Laymon 1984, Laymon and Halterman 1989, Dettling and Howell 2011).

In most of the DPS, the western yellow-billed cuckoo primarily breeds in large riparian woodlands dominated by willow and cottonwood along low-gradient rivers and streams, and in open riverine valleys that provide wide floodplain conditions (USFWS 2014a,b). In the Southwest, however, cuckoos can also breed in higher gradient drainages, and narrower and drier reaches of riparian habitat (Corman and Magill 2000; WestLand Resources, Inc. 2013a, 2013b, 2015a, 2015b, 2015c; Cornell Lab of Ornithology 2017; MacFarland and Horst 2015, 2017; Tucson Audubon 2015; Arizona Game and Fish Department (AGFD) 2016). Large expanses of gallery riparian woodland habitat supports greater densities of cuckoos than less dense reaches of scattered riparian trees or more xero-riparian woodlands. However, these less dense reaches of scattered riparian trees and more xero-riparian woodlands are also important to yellow-billed cuckoos as nesting substrate, foraging habitat, and as a buffer between more hydric sites and the adjacent, xeric uplands (USFWS 2014a, b; Griffin 2015; Groschupf 2015; McFarland and Horst 2015, 2017). To distinguish between the western yellow-billed cuckoo breeding habitat in riparian areas throughout the range and breeding habitat found in more arid areas of the Southwest, we use the terms “Rangewide” and “Southwestern” breeding habitat, respectively. We describe both the Rangewide and Southwestern breeding habitat below:

### Rangewide breeding habitat

Rangewide breeding habitat (including in the Southwest) is generally, but not exclusively, comprised of mixed willow and cottonwood riparian woodlands with an overstory and understory vegetation component in contiguous or nearly contiguous patches. Rangewide

breeding habitat is usually within floodplains or in upland areas or terraces adjacent to watercourses often greater than 325 ft (100 m) in width and 200 ac (81 ha) or more in extent (USFWS 2014a). The width of some patches may be less, depending on location and habitat conditions. The slope of the water courses within or adjacent to habitat patches is generally less than 3% but may be greater in some instances. The habitat patches are usually dominated by willow or cottonwood, but are sometimes dominated by other riparian species of similar structure (for example boxelder). Habitat patches contain one or more nesting groves that have above average canopy closure (greater than 70%), and have a cooler, more humid environment than the surrounding riparian and otherwise arid upland habitats (Laymon and Halterman 1989, Hughes 1999). These features provide sites for breeding, nesting, sheltering, and foraging. Riparian breeding habitat in the Southwest ranges from the dense habitat described above to narrower and more sparsely vegetated habitat (described below).

### Southwestern breeding habitat

Southwestern breeding habitat is located in the Southwestern United States (particularly in Arizona) and is comprised of riparian woodlands, mesquite woodlands, or Madrean evergreen woodlands with a variable overstory canopy and understory component within drainages at least 200 ac (81 ha) in size. In addition to cottonwood, willow, and mesquite, occupied riparian habitat in Arizona may also contain a greater proportion of xero-riparian species than in the rest of the DPS. Oak, hackberry, sycamore, walnut, ash, acacia, tamarisk, and juniper are among the most common xero-riparian species in Southwestern breeding habitat (Corman and Magill 2000, Corman and Wise-Gervais 2005, USFWS unpubl. data). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component within the occupied habitat (Gaines and Laymon 1984, Johnson et al. 2008, McNeil et al. 2013, Sechrist et al. 2013, Carstensen et al. 2015). Habitat patches in the arid Southwest contain a greater proportion of xero-riparian and nonriparian tree species than elsewhere in the DPS. Habitat patches are often interspersed with large openings and include narrow stands of trees, small groves of trees, or sparsely scattered trees. As such, the canopy closure is variable, and where trees are sparsely scattered, canopy closure may be dense only at the nest tree. Southwestern breeding habitat types are as follows:

- Riparian woodland is more water-limited, contains a greater proportion of xero-riparian species, and is often narrower, patchier, and sparser than where water is more abundant. This more arid riparian woodland occurs in perennial and intermittent drainages and floodplains throughout the Southwest.
- Mesquite-dominated woodland habitat occurs in floodplains, adjacent terraces, and adjacent uplands in perennial, intermittent, and ephemeral drainages throughout the Southwest.
- Madrean evergreen woodland (usually oak-dominated) habitat occurs in intermittent and ephemeral drainages and adjacent hillsides in the foothills and mountains of southeastern Arizona, up to 7000 ft (2,134 m) in elevation. The amount of oak varies and may be interspersed with mesquite and other species in Madrean evergreen woodland.



### *Nest Site*

A large majority of nests are placed in willow trees, but cottonwood, mesquite, walnut, box elder, sycamore, hackberry, oak, alder, soapberry (*Sapindus saponaria*), seepwillow (*Baccharis glutinosa*), acacia, pecan (*Carya* sp.), prune (*Prunus domestica*), almond (*Prunus dulcis*) and tamarisk are also used (Laymon 1980, Groschupf 1987, Kingsley 1989, Laymon 1998, Hughes 1999, Launer et al. 1990, Corman and Magill 2000, Halterman 2001, Halterman 2002, Halterman 2003, Halterman 2004, Corman and Wise-Gervais 2005, Halterman 2005, Halterman, 2006, Halterman 2007, Holmes et al. 2008, McNeil et al. 2013, Tucson Audubon 2015, Groschupf 2015, *in litt.*, MacFarland and Horst 2015). Cuckoos may also nest at more than one location in a year (USFWS 2014a,b). On the upper San Pedro River, many cuckoos re-nested following both successful and unsuccessful nesting attempts (Halterman 2009). These subsequent nests are sometimes hundreds of meters away from previous nests. Yellow-billed cuckoos at this site appear to be regularly double-brooded, and occasionally triple brooded, based on behavior and timing of nests. On the upper San Pedro River, cuckoos were not regularly detected on surveys until late June, and breeding in some years did not begin until late July (Halterman 2006). The breeding season for cuckoos in southeastern Arizona appears to be prolonged, however, and in most years conditions are apparently right for producing multiple broods.

### *Hydrological Conditions*

Habitat for the western yellow-billed cuckoo in much of its range is largely associated with perennial rivers and streams that support the expanse of vegetation characteristics needed by breeding western yellow-billed cuckoos. The range and variation of stream flow frequency, magnitude, duration, and timing that will establish and maintain riparian habitat can occur in different types of regulated and unregulated flows depending on the interaction of the water and the physical characteristics of the landscape (Poff et al. 1997, USFWS 2014). Cuckoos often nest where young trees interface with more mature trees, such as along the scour zone of rivers or newly planted revegetation sites on the lower Colorado River (McNeil et al. 2013). Hydrologic conditions at western yellow-billed cuckoo breeding sites can vary widely between years and during low rainfall years, when water or saturated soil may not be present. Cuckoos may move from one area to another within and between years in response to hydrological conditions.

### *Humidity*

Humid and cooler conditions created by surface and subsurface moisture and trapped by the multilayered canopy appear to be important habitat parameters for the western yellow-billed cuckoo. The western yellow-billed breeds in drainages where humidity is adequate for successful hatching and rearing of young (Hamilton and Hamilton 1965; Gaines and Laymon 1984; Rosenberg et al. 1991; McFarland and Horst 2015, 2017). The moist and humid conditions that support riparian plant communities typically exist in lower elevation, broad floodplains, as well as where rivers and streams enter impoundments. However, these conditions can also be found in some areas up to 7,000 ft (2,134 m) (or slightly higher in western Colorado, Utah, and Wyoming) in elevation. In the foothills and mountain xero-riparian drainages of southeastern Arizona and Sonora Mexico, high humidity and the summer monsoon are important factors in cuckoo presence (USFWS 2014a,b; MacFarland and Horst 2015, 2017).

### *Foraging Habitat*

In addition to the dense nesting grove or tree, often referred to as the core area, western yellow-billed cuckoos need adequate foraging areas near the nest. Foraging areas can be less dense or patchy with lower levels of canopy cover and may be a mix of shrubs, ground cover, and scattered trees (Sechrist et al. 2009, 2013; Carstensen et al. 2015; Griffin 2015; USFWS, unpubl. data). Cuckoos often forage in open areas, woodlands, orchards, and adjacent streams (Hughes 1999), which include stands of smaller mesquite trees and even tamarisk (Rosenberg et al. 1991). In Arizona, adjacent habitat is usually more arid than occupied nesting habitat. This adjacent habitat can be used for foraging where large insects are produced. Foraging habitat includes Sonoran desertscrub, Mojave desertscrub, Chihuahuan desertscrub, chaparral, semidesert grassland, plains grassland, and Great Basin grasslands (Brown and Lowe 1982, Brown 1994, Brown et al. 2007).

### *Migration Habitat*

Migration habitat needs are not well known, although they appear to include a relatively wide variety of conditions. Migrating yellow-billed cuckoos have been found in coastal scrub, second-growth forests and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding (USFWS 2014a).

### **Distribution and Abundance**

The yellow-billed cuckoo is a member of the avian family Cuculidae and is a Neotropical migrant bird that winters in South America and breeds in North America. The breeding range of the entire species formerly included most of North America from southeastern and western Canada (southern Ontario and Quebec and southwestern British Columbia) to the Greater Antilles and northern Mexico (American Ornithologists Union (AOU) 1957, 1983, 1998).

Based on historical accounts, the western yellow-billed cuckoo was formerly widespread and locally common in California and Arizona, more narrowly distributed but locally common in New Mexico, Oregon, and Washington, and uncommon along the western front of the Rocky Mountains north to British Columbia (AOU 1998, Hughes 1999). The species may be extirpated from British Columbia, Washington, and Oregon (Hughes 1999). The western yellow-billed cuckoo is now very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah, with single, nonbreeding birds most likely to occur (USFWS 2014a, 2014b). The largest remaining breeding areas are in southern and central California, Arizona, along the Rio Grande in New Mexico, and in northwestern Mexico (USFWS 2014b).

In Arizona, the species was a common resident in the (chiefly lower) Sonoran zones of southern, central, and western Arizona (Phillips et al. 1964). The yellow-billed cuckoo now nests primarily in the central and southern parts of the state, as well as at revegetation sites along the lower Colorado River (McFarland and Horst 2015; USFWS 2014a, 2014b, McNeil et al. 2013).

The San Pedro River has the largest population of YBC in Arizona and one of the largest in the western distinct population segment (the entity listed as threatened; USFWS 2014a). The Gila River also contains an important population of western YBC in both New Mexico and Arizona. Yellow-billed cuckoos spend the winter in South America, east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern

Argentina (Ehrlich et al. 1992, AOU 1998). Wintering yellow-billed cuckoos generally use woody lowland vegetation near fresh water. However, wintering habitat of the western yellow-billed cuckoo is poorly known.

### **Presence in Arizona Riparian and Mesquite Woodlands**

Many drainages throughout Arizona have not been thoroughly surveyed and it is likely that additional yellow-billed cuckoo locations will be discovered as additional surveys are conducted. In a survey in 1999 that covered 265 mi (426 km) of river and creek bottoms (a subset of statewide cuckoo habitat), 172 yellow-billed cuckoo pairs and 81 single birds were located in Arizona (Corman and Magill 2000). More recently, results of surveys in 2018 surveys clearly documented that cuckoos nest widely and in significant numbers in upland, ephemeral drainages of southern Arizona. Out of 36 sites where nest monitoring was conducted in 2018 in southeastern Arizona, yellow-billed cuckoos were documented breeding at 17 sites (15 sites with nests, plus two additional sites with juveniles), with possible breeding at two additional sites where copulation and feeding (of mate or fledgling) was observed (Sferra et al. 2019). Based on this study, site-specific studies, protocol cuckoo surveys, and incidental detections, we know that drainages with yellow-billed cuckoos during the breeding season include (American Birding Association 2014, AGFD 2016, USFWS 2014a, Cornell Lab of Ornithology 2017, USFWS unpubl. data):

- Bill Williams River
- Lower Colorado River
- Middle Gila River
- Hassayampa River
- San Pedro River
- Santa Maria River
- Verde River
- Sonoita Creek
- Santa Cruz River
- Big Sandy River
- Arivaca Cienega and Creek
- Altar Valley
- Agua Fria River
- Roosevelt Lake complex
- Upper Tonto Creek
- Pinto Creek
- Mineral Creek
- Oak Creek
- Cienega Creek
- Babocomari River
- Pinal Creek
- Bonita Creek
- San Bernardino National Wildlife Refuge
- Hooker Hot Springs
- Big Sandy River

- Many smaller drainages.

### **Presence in Southeastern Arizona Mountain Ranges**

In addition to gallery riparian forest and mesquite woodlands, yellow-billed cuckoos are also using more xero-riparian drainages in the foothills and mountains of southeastern Arizona (Corman and Magill 2000; American Birding Association 2014; AGFD 2016; WestLand Resources, Inc. 2013a, 2013b, 2015a, 2015b, 2015c; Tucson Audubon 2015; MacFarland and Horst 2015, 2017; MacFarland 2017 *in litt.*; Cornell Lab of Ornithology 2017; Marshall 2017 *in litt.*; Moors 2017 *in litt.*). This kind of habitat is more typical of habitat where cuckoos are found in Sonora, Mexico (Russell and Monson 1998, Flesch 2008). Cuckoos have been detected in at least two years either as a single bird or as pairs in one year during the breeding season in the following areas:

- Santa Rita Mountains: Mid-Temporal Gulch, Upper Temporal Gulch; Florida, Madera, Gardner, Chino, Montosa, Box, Walker, Wasp, McCleary, and Barrel Canyons; and in Salero Ranch;
- Huachuca Mountains: Carr, Ash, Garden, Ramsey, and Miller Canyons;
- Canelo Hills: Cherry Creek, Turkey and O'Donnell Creeks, Collins, Lyle, Merritt, and Korn Canyons;
- Babocomari River (valley bottom between mountain ranges);
- Atascosa/Pajarito Mountains: Fresnal Wash, Arivaca Lake and tributaries, Pena Blanca Lake and Canyon, California Gulch, Rock Corral, Scotia, and Sycamore Canyons;
- Baboquivari Mountains, foothills, and bajada: Brown Canyon, Brown Wash, Santa Margarita Wash, Canoa Wash, Cuadro Wash, Las Guijas Wash, Vineyard Bosque, Kitt Peak;
- Patagonia Mountains: Alum Creek, Hermosa Creek, Paymaster Spring, Sycamore, Corral, Harshaw, Goldbaum, and Willow Springs Canyons;
- Whetstone Mountains: French Joe and Guindani Canyons;
- Catalina Mountains: Peppersauce Canyon, Tanque Verde Creek, Catalina State Park;
- Rincon Mountains: Paige Creek;
- Dragoon Mountains: Slavin Gulch;
- Chiricahua Mountains: Cave Creek.

Yellow-billed cuckoos are likely breeding in a subset of these locations, with nesting confirmed in 17 drainages: Smith Canyon, Mid-Temporal Gulch, Upper Temporal Gulch, Chino, Montosa, Florida, Box, and Madera Canyons in the Santa Rita Mountains; Fresnal Wash, Rock Corral Canyon, California Gulch, Sycamore Canyon and Pena Blanca Lake in the Atascosa/Pajarito Mountains; Peppersauce Canyon and Tanque Verde Wash in the Catalina Mountains; Paige Creek in the Rincon Mountains; Goldbaum Canyon, Willow Spring Canyon, and Harshaw Canyon complex in the Patagonia Mountains; Cherry Creek in the Canelo Hills; Brown Canyon, Brown Wash, Canoa Wash, Cuadro Wash, and Kitt Peak in the bajada and foothills of the Baboquivari Mountains, (American Birding Association 2014; Tucson Audubon 2015; MacFarland and Horst 2015, 2017; Cornell Lab of Ornithology 2017; Corson 2019; Sferra et al. 2019).

## Threats

The primary threat to the western yellow-billed cuckoo is loss or fragmentation of high-quality riparian habitat suitable for nesting (Corman and Wise-Gervais 2005; USFWS 2014a,b). Habitat loss and degradation results from several interrelated factors, including alteration of flows in rivers and streams, mining, encroachment into suitable habitat from agricultural and other development activities on breeding and wintering grounds, stream channelization and stabilization, diversion of surface and ground water for agricultural and municipal purposes, livestock grazing, wildfire, establishment of nonnative vegetation, drought, and prey scarcity due to pesticides (Ehrlich et al. 1992, USFWS 2014b). Pesticide use is widespread in agricultural areas in the western yellow-billed cuckoo breeding range in the United States and northern Mexico. Yellow-billed cuckoos have also been exposed to the effects of pesticides on their wintering grounds, as evidenced by DDT found in their eggs and eggshell thinning in the United States (Grocki and Johnston 1974, Laymon and Halterman 1987a, Hughes 1999, Cantu-Soto et al. 2011). Because much of the species' habitat is in proximity to agriculture, the potential exists for direct and indirect effects to a large portion of the species in these areas through altered physiological functioning, prey availability, and, therefore, reproductive success, which ultimately results in lower population abundance and curtailment of the occupied range (Laymon 1980, Laymon 1998, Hughes 1999, Colyer 2001 *in litt.*, Hopwood et al. 2013, Mineau and Palmer 2013, Mineau and Whiteside 2013, USFWS 2014b).

The ongoing threats, including small isolated populations, cause the remaining populations to be increasingly susceptible to further declines and local extirpations through increased predation rates, barriers to dispersal by juvenile and adult yellow-billed cuckoos, chance weather events, fluctuating availability of prey populations, collisions with tall vertical structures during migration, defoliation of tamarisk by the introduced tamarisk leaf beetle (*Diorhabda* spp.), increased fire risk, and climate change events (Thompson 1961, McGill 1975, Wilcove et al. 1986). The warmer temperatures already occurring in the southwestern United States may alter the plant species composition of riparian forests over time. An altered climate may also disrupt and change food availability for the western yellow-billed cuckoo if the timing of peak insect emergence changes in relation to when the cuckoos arrive on their breeding grounds to feed on this critical food source.

Habitat for the western yellow-billed cuckoo has been modified and reduced, resulting in only remnants of formerly large tracts of native riparian forests, many of which are no longer occupied by western yellow-billed cuckoos. Despite recent efforts to protect existing, and restore additional, riparian habitat in the Sacramento, Kern, and Colorado Rivers, and other rivers in the range of the western yellow-billed cuckoo, these efforts offset only a small fraction of historical habitat that has been lost. Therefore, we expect the threats resulting from the combined effects associated with small and widely separated habitat patches to continue to affect a large portion of the range of the western yellow-billed cuckoo.

Cuckoos breeding in the monsoon-driven ephemeral drainage habitats of southeastern Arizona could be a possible refugia for recovery; if the perennial drainage habitat declines due to climate change and increasing human water use in the future, the monsoon-driven drainages may offer some resiliency. Although the density of cuckoos in each ephemeral drainage may be sparse, collectively among the ephemeral drainages in southeastern Arizona and Mexico, there are likely

many cuckoos. Occupied drainages in Mexico may fare better with climate change because they receive more monsoonal rain than Arizona or New Mexico.

## **ENVIRONMENTAL BASELINE—WESTERN YELLOW-BILLED CUCKOO**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of the YBC analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above.

### **Status of the species and proposed critical habitat within the action area**

#### *Life History and Habitat*

Life history of YBC is described above in the Status of the Species in the sections relating to Arizona. Approximately 10,200 acres of cuckoo habitat exist within the action area. This includes riparian woodlands that extend continuously for many miles and have the spatial extent, canopy closure (80 percent), and structural development of cuckoo breeding and foraging habitat. The northernmost reach of the SPRNCA is dominated by tamarisk, although Fremont cottonwood and Goodding's willow are present in this area. This area may provide potential cuckoo breeding habitat (USFWS 2016), as cuckoos breed in mixed native/tamarisk and tamarisk-dominated habitat in Arizona and New Mexico, and tamarisk may contribute toward cover, temperature amelioration, increased humidity, and insect production where native habitat has been compromised by altered hydrology. Cuckoos do not usually breed in monotypic tamarisk habitat in Arizona; however, cuckoos may use monotypic tamarisk habitat for foraging if it is adjacent to or near mixed native/tamarisk habitat. Foraging habitat within the action area extends into the uplands adjacent to currently suitable breeding habitat and may vary in species composition and density (USFWS 2016).

In a study from 2001-2005 within the action area, the average 95% KDE home range of 28 cuckoos tracked for at least 7 days each was 39 ha, ranging from 1.5-158.1 ha (Table YBC-1; Halterman 2009). There were large variances for all home range estimates. There was no significant difference in home range size for nesting or non-nesting, or mated or unmated cuckoos. Males and females had significantly different home ranges sizes, with female home ranges estimated to be 60% smaller than those of males. Double-brooded cuckoos moved significantly farther to renest if their first nest was unsuccessful. Additionally, in Arizona,

adjacent habitat is usually more arid than occupied nesting habitat. This adjacent habitat can be used for foraging where large insects are produced.

In this same study, many cuckoos renested following both successful and unsuccessful nesting attempts (Halterman 2009). These subsequent nests are sometimes hundreds of meters away from previous nests. Yellow-billed cuckoos within the action area appear to be regularly double-brooded, and occasionally triple brooded, based on behavior and timing of nests. Cuckoos were not regularly detected on surveys until late June, and breeding in some years did not begin until late July (Halterman 2006). High humidity and the summer monsoon are likely important factors in cuckoo presence in Arizona, including within the action area (USFWS 2014a,b; MacFarland and Horst 2015, 2017).

Habitat needs during migration are not well understood; however, they appear to include a relatively wide variety of conditions. Many neo-tropical migrants use the San Pedro River corridor as passage to more northerly breeding areas, including the YBC (MAPS data on file BLM).

#### *Distribution, Abundance, and Population Trends*

Yellow-billed cuckoo habitat as described in Arizona in the Status of the Species is present within the action area, and YBC have been documented on the San Pedro and Gila Rivers within the action area (WestLand 2015a, AGFD 2016, Halterman et al. 2016). The San Pedro River has the largest population of yellow-billed cuckoos in Arizona and one of the largest in the western DPS (USFWS 2014a). The Gila River also contains an important population of western yellow-billed cuckoos in both New Mexico and Arizona. These birds occupy mesquite bosque dominated by an overstory of velvet mesquite (*Prosopis velutina*) and stringers of Fremont cottonwood (*Populus fremontii*)/Goodding's willow (*Salix gooddingii*) present in areas along the rivers' edges.

The Arizona Breeding Bird Atlas indicates confirmed yellow-billed cuckoo breeding along the upper San Pedro River (Corman and Wise-Gervais 2005), including within the action area. Data available on eBird (Cornell Laboratory of Ornithology 2017) provide numerous records of yellow-billed cuckoo observations along the San Pedro River between the international border and the community of St David; many detections were during the breeding season.

#### *Threats*

Threats to the yellow-billed cuckoos within the action area include habitat modification and loss from dam construction and operations, groundwater extraction, surface water diversions, stream channelization, stream stabilization, land conversion, agricultural activity, road placement and transportation infrastructure, urbanization, long-term changes in climate and increased incidence of wildfire (USFWS 2014b, BLM files).

#### *Past and Ongoing Federal Actions in the Action Area*

Within Arizona, 31 projects have undergone formal section 7 consultation for effects to YBC, with several actions (e.g., vegetation treatments, resource management planning) occurring in the Upper San Pedro watershed (see the Arizona Ecological Services Office [section 7 website](#) for

these consultations). Specifically within the SPRNCA, two projects with potential impacts to YBC are ongoing:

- 5) Effects of tamarisk treatment on the SPRNCA was consulted on in 1995 (San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation #22410-2009-I-0195]), with reinitiation in 2018 (Reinitiation of San Pedro Riparian National Conservation Area Tamarisk Management Project [Consultation # 02EAAZ00-2018-F-1018]); and
- 6) Effects of livestock grazing on the four existing allotments on the SPRNCA was consulted on in 2012 (Biological Opinion on the Gila District Grazing Program, 22410-2006-F-0414), with reinitiation in 2018.

While the federal actions throughout the action area resulted in adverse effects to the species, consultations also included measures to reduce adverse effects on the taxon (such as avoiding actions during the breeding season) and resulted in non-jeopardy determinations.

#### *Summary of the Status of the Species in the Action Area*

Arizona represents one of three states with the highest historical number of YBC pairs (the others being California and New Mexico). However, most locations in Arizona that have western yellow-billed cuckoo populations have not been surveyed regularly enough to provide population trend information. The action area includes one of two locations with semi-regular monitoring (the other being the lower Colorado River), both of which show downward trends in YBC populations (USFWS 2014, Parametrix and Southern Sierra Research Station 2019). The aggregate effects of habitat modification and loss, groundwater extraction and surface water diversions, stream channelization and stabilization, land conversion, and long-term change in climate likely contribute to this trend.

### **EFFECTS OF THE ACTION—WESTERN YELLOW-BILLED CUCKOO**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

We anticipate that the proposed action, the SPNRCA RMP, will result in net beneficial effects on yellow-billed cuckoos by, among other actions, maintaining and managing for riparian and wildlife habitat. Overall, such management should provide opportunities for cuckoos to use the SPRNCA on a long-term (e.g., establish a home range) or short-term (e.g., use during migration) basis. That said, individual components of the SPRNCA RMP are likely to adversely affect yellow-billed cuckoos; these effects are discussed in the RMP components' sections below.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on yellow-billed cuckoos in detail (e.g., spatial extent,



location, timing, frequency, duration); however, this will be done during future implementation level consultations. Furthermore, potential adverse effects associated with the RMP may be minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

The aim of the analysis below is to point out activities in the RMP that may affect cuckoos and discuss the general types of effects these activities may have on the species. In some cases, management actions lack detail (e.g., review and assess water needs for resources managed on the SPRNCA and acquire and perfect new water rights as deemed necessary for management) to understand if they have associated on-the-ground impacts that may affect YBC. In these cases, we assume the management action will not affect cuckoos and that possible effects inadvertently overlooked at the programmatic level will be addressed by BLM in future implementation level consultations.

## **Overview of Potential Effects to Yellow-Billed Cuckoo**

### Disturbance

Disturbance to YBC may occur from both auditory and visual stimulus arising from multiple components of the action. Human presence (both pedestrians and vehicles), hunting dog and pet presence, lights, and noise are associated with many components of the action, including but not limited to Vegetation Management, Wildland Fire, Livestock Grazing, and Recreational and Travel Management. Disturbance to YBC can result in increased energetic expenditures due to increased movement rates and probabilities of flight response, habitat avoidance, and interference with habitat use, including during the breeding season. These could lead to decreased potential for reproduction, including destroyed nest sites, fledgling mortality, and abandonment of territories. Disturbance can also expose YBC to increased predation.

The degree of potential disturbance that each RMP component may have on YBC would depend on various aspects of the action, including its spatial extent, location, timing, frequency, and duration. In general, larger (in size), longer (in duration), and/or more frequent projects are more likely to disturb YBC resulting in adverse behavioral changes. Projects that are smaller, shorter, and/or less frequent are less likely to disturb YBC.

### Direct Injury and Mortality

Direct injury or mortality of YBC could occur from collisions with vehicles using the SPRNCA (i.e., BLM staff and BLM authorized vehicular use).

### Habitat Impacts

Impacts to YBC habitat may occur from multiple project components, including Vegetation Management, Livestock Grazing, and Recreational and Travel Management. These would mainly be the result of livestock grazing infrastructure and construction of new recreation sites, campgrounds, and planned trails. Development of infrastructure and facilities would create areas of cleared vegetation, causing local habitat loss and fragmentation. That said, proposed RMP activities are anticipated to result in only a small amount of loss (permanent and temporary) or modification of YBC habitat. While some RMP activities may reduce or modify a small amount

of potential YBC habitat, overall, management of open space on the SPRNCA will benefit YBC and their habitat and foraging resources.

### **Air Quality**

Management of air quality may have indirect beneficial effects on YBC through the reduction of air pollutants, and is not anticipated to have adverse impacts on the species.

### **Soil and Watershed Management**

Actions to control erosion on 5,040 acres and recharge enhancement on about 2,170 acres of ephemeral tributaries would likely improve watershed health and groundwater recharge, which should maintain or improve habitat for YBC. However, because such actions may occur within areas that YBC may occupy, human activities associated with erosion control and recharge enhancement may result in temporary disturbance to YBC through the loss of vegetation riparian and mesquite bosque areas.

Dismantling or altering human-made structures (over 50 acres), such as agricultural dikes and berms, railroad grades, and ditches and diversions, to restore hydrological function, especially as it relates to recharge, would improve channel, floodplain, and riparian function in YBC habitat. Similarly, the modification of roads and trails adversely affecting watershed health and function would improve watershed conditions and therefore provide a net benefit for YBC. That said, removal of structures and modification of roads and trails may result in temporary disturbance to YBC.

Specific locations and acres to be treated at any one time in areas that could support yellow-billed cuckoos would be determined during the project implementation planning process. In general, however, watershed treatments would be spread out over space and time, thus allowing cuckoos to move to adjacent areas not undergoing treatment. Additionally, potential adverse effects associated with soil and watershed management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Water Management**

Water Management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. We anticipate water management actions will have beneficial effects by conserving water for wildlife, including YBC and its habitat. That said, the private use of wells near Hereford may result in adverse effects to YBC by decreasing surface flows, which may result in decreased herbaceous riparian vegetation and diminished YBC habitat.

In addition, short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on YBC habitat. As conditions indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS in order to reduce potential adverse effects that may become apparent once details of the activity are known; therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management: All Vegetation Communities**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should result in long-term beneficial effects to YBC. Multiple vegetation management actions, however, may adversely affect YBC. For example, vegetation treatments, such as use of biological controls (e.g., targeted livestock grazing, insects), herbicide, prescribed fire, and mechanical treatments to suppress, control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics, may disturb YBC and result in a temporary loss or reduction in vegetation, reducing habitat suitability for YBC. Individuals (particularly young before they fledge) could be directly injured or killed during prescribed fire and mechanical treatment activities, if these activities occur within the breeding season. Disturbance to YBC as a result of these actions is anticipated to occur intermittently throughout the life of the action and potentially could affect their movement and habitat use, although impacts from these treatments should be localized and short-lived. Additionally, these treatments would be spread out over space and time, thus allowing cuckoos to move to adjacent areas not undergoing treatment, and treatments would likely occur outside the breeding season, if possible. Maintenance of firebreaks may result in long-term reduction in potential habitat, but firebreaks should protect large tracts of riparian and mesquite bosque (including YBC habitat) from loss due to wildfire (see the **Wildland Fire and Management** section below for further information on this RMP element).

Targeted livestock grazing would be used on a case-by-case basis to reduce fuel loads or control invasive species in small areas over short periods of time using electric fencing to contain livestock. If targeted livestock grazing occurs in occupied habitat, YBC could be disturbed and vegetation could be temporarily altered. No plans are currently in place to use insects as a biological control. The use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation in food items, and loss or damage to habitat. Chemicals for spot treatment of vegetation, when applied as directed, would be used in such small quantities that there would likely be little to no toxic effects on YBC or its food sources (details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007)). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required. Implementation of conservation measures, such as selecting herbicides that have low toxicity to wildlife, should reduce the likelihood of impacts to YBC and its habitat.

About 27,460 acres of vegetation may be treated as part of this RMP element; this area includes private and state-administered land within the SPRNCA boundary. The estimates of acreage by specific treatment type for all vegetation types are prescribed fire 17,070; mechanical 6,130; herbicide 11,040 (the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). The USFWS and BLM consulted on the effects to SWFL from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). YBC were not listed at the time of consultation but will be addressed in a

reinitiated consultation. In this consultation BLM committed to implementing conservation measures for various species including those with similar habitat needs (e.g., SWFL); these will also be applied to YBC and therefore, these effects will not be addressed in this RMP consultation. Most of these vegetation treatments would occur in the uplands and in the long-term should indirectly benefit riparian vegetation, thereby benefitting YBC on the SPRNCA. Specific locations and acres to be treated at any one time in areas that could support YBC would be determined during the project implementation planning process. Potential adverse effects associated with vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management Specific to Riparian and Wetland Areas**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and wetland vegetation management, which aim to maintain, restore, and improve the ecological function of riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to YBC. By protecting and restoring sensitive wetland ecological sites, adjacent riparian and mesquite woodland habitat that may be used by YBC would be maintained or improved through wetland hydrological processes.

Multiple riparian and wetland vegetation management actions, however, may adversely affect YBC. For example, vegetation treatments may require the use of herbicide, prescribed fire, and mechanical treatments to suppress, control, or eliminate invasive species and create and maintain firebreaks to reduce fuel characteristics. The effects of these treatments are discussed above in **Vegetation Management: All Vegetation Communities**.

Specific locations and acres to be treated at any one time in areas that could support YBC would be determined during the project implementation planning process. Potential adverse effects associated with riparian and wetland vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Vegetation Management Specific to Sandy Washes (Xeric Riparian)**

Overall, vegetation management related to sandy washes, which aims to maintain the functionality, variability, and extent of desert washes and the vegetation communities within these xeric riparian areas, should result in long-term beneficial effects to YBC. By protecting and restoring desert washes, habitat that may be used by YBC for movement, nesting, and foraging would be maintained or improved. Any effects due to management activities would be similar to those described above in **Vegetation Management: All Vegetation Communities**.

### **Vegetation Management Specific to Upland Vegetation Communities (Chihuahuan Desert Scrub and Grasslands)**

Overall, restoration of the ecological integrity of 40,310 acres of upland vegetation, primarily through development of the grassland component of the plant community, may benefit YBC by

improving the quality of vegetation, including mesquite bosque habitat. That said, some vegetation management for the restoration of abandoned farm fields using native plantings, seeding, heavy equipment, herbicide, prescribed fire, and biological control may occur in locations close enough to occupied YBC habitat to disturb nesting or foraging birds. Mesquite bosque areas may be included in treatment, resulting in some loss of YBC habitat; however, mesquite bosque foraging areas near breeding locations in riparian habitat are large and readily available. The discussion of effects on YBC and habitat are the same as that in **Vegetation Management: All Vegetation Communities** above.

Specific locations and acres to be treated at any one time in areas that could support YBC would be determined during the project implementation planning process. Potential adverse effects associated with upland vegetation management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Fish, Wildlife, and Special Status Species**

This RMP element, including managing for priority wildlife and supporting, maintaining, and restoring wildlife habitat and habitat connectivity, is likely to benefit YBC. For example, the protection of springs and associated vegetation for wildlife would help maintain the integrity of small, local YBC nesting and foraging sites. Additionally, beaver populations would result in localized increases in the water table, which would promote long-term establishment of riparian vegetation in some areas. This would subsequently improve habitat conditions for YBC and its foraging resources. That said, some fish and wildlife activities in or near riparian or mesquite bosque habitat may have adverse effects on YBC. For example, disturbance could result from fish barrier project implementation, including revegetation activities or through a temporary loss of small patches of habitat, until vegetation reestablishes and has suitable structural characteristics.

Specific locations and acres to be treated at any one time in areas that could support YBC would be determined during the project implementation planning process. Potential adverse effects associated with fish, wildlife, and special status species management could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210). YBC were not listed at the time of consultation but will be addressed in a reinitiated consultation. In this consultation BLM committed to implementing conservation measures for various species including those with similar habitat needs (e.g., SWFL); these will also be applied to YBC and therefore, these effects will not be addressed in this RMP consultation.

Additionally, the conservation area will continue to have an estimated 610 acres of firebreaks, 580 acres of which are BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. The USFWS and BLM addressed the effects of these firebreaks in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion #02EAAZ00-2015-F-0431), and therefore, these effects will not be addressed in this RMP consultation.

### **Cultural Resources**

The cultural resources goals are to identify, preserve, and protect significant cultural resources to ensure that they are available for appropriate uses by present and future generations, for such purposes as research, education, and preservation of cultural heritage. Some cultural resource management actions could affect YBC; for example, activities related to the stabilization and rehabilitation of cultural sites may occur in locations close enough to occupied YBC habitat to disturb nesting or foraging birds. However, overall, potential impacts from these activities should be localized and short-lived.

Specific locations for these activities in areas that could support YBC would be determined during the project implementation planning process. Potential adverse effects associated with cultural resources could be minimized through implementing conservation measures developed through project level section 7 consultation (such as seasonal restrictions during the breeding season (May 15-September 30)); therefore, the specific levels of different adverse effects are difficult to estimate at the RMP level.

### **Native American Concerns**

The Native American Concerns goals are strengthening government-to-government relationships through increased coordination, increasing knowledge and documentation of Native American traditional cultural values and uses of the SPRNCA, and accommodating traditional cultural uses as consistent with laws, regulations, and authorities. Some management actions associated with these goals may result in a short-term (minutes to a few hours) disturbance to YBC on an infrequent basis over the life of the plan. The discussion of effects on YBC due to disturbance are the same as that in the **Vegetation Management: All Vegetation Communities** section above.

### **Visual Resources**

No effects to YBC are anticipated from management of visual resources.

### **Paleontological Resources**

No effects to YBC are anticipated from management of paleontological resources.

### **Livestock Grazing**

The USFWS and BLM consulted on the effects to Federally listed species and designated critical habitat from livestock grazing on the four SPRNCA allotments in the Biological Opinion for the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414) in 2012. Because YBC had not been listed and critical habitat had not been proposed at the time, this consultation has been reinitiated for YBC and formal conference for proposed critical habitat within these

four allotments. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation, but instead will be addressed separately in the reinitiation of the Biological Opinion for the Gila District Grazing Program consultation.

### **Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and educational opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Recreational activity ranges from heavy (e.g., large groups birdwatching and hiking near the San Pedro House) to very light (e.g., back country hiking, hunting and fishing off trail). Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to adversely impact YBC and its habitat. The educational component of recreation management is likely, however, to benefit YBC by providing information to the public about species and resource conservation.

Disturbance to YBC from recreation and travel management activities may occur from noise and human activities within occupied areas. Human presence associated with such activities as hiking or backpacking would likely disturb YBC and could cause them to avoid habitat and exhibit other behavioral responses. The area of YBC habitat potentially affected by noise and human activities is estimated at 605 acres of Fremont cottonwood-Goodding's willow (riparian) habitat and 3,440 acres of mesquite bosque. For YBC, noise is the strongest predictor of occupancy in otherwise suitable habitat; the number of YBC in noisy areas was 35 to 55 percent fewer than in quieter areas (Goodwin 2009). Unpredictable noise may be perceived as a threat by YBC and may cause startling and flight responses, physiological stress, and displacement or habitat avoidance. Potential effects from the proposed action would typically occur during the day when projects or treatments take place, and would be intermittent throughout the day. Noise levels would depend on the type of equipment being used and effects would be related to the duration, intensity, and expanse of recreation. Chronic and frequent noise inhibits the ability of wildlife to detect important sounds (Francis and Barber 2013). Chronic noise may result from such activities as motorized vehicle use and would continue as long as motorized routes are in use. Frequent noise from construction of recreation facilities would typically occur during the day and would continue until construction ends. Intermittent, short-term, and localized noise may result from non-motorized activities such as hiking, camping, and hunting. The San Pedro House area, however, is frequented by YBC even though it has the highest visitation of any location within the SPRNCA, so it appears that some level of human activity can be tolerated in some areas.

Motorized vehicle use associated with recreation and travel management could adversely affect YBC through noise disturbance as described above. Deaths of YBC due to collisions with vehicles are possible, although unlikely, assuming drivers abide by the State imposed speed limit of 25 mph for unposted rural dirt roads. Additionally, no off-road vehicle travel is permitted, thus minimal impacts to YBC habitat are anticipated. Motorized roads within the SPRNCA include 9 miles (14.2 acres) that are open to the public; 6.6 miles (10.4 acres) that are open to the

public through lease from the Arizona State Land Department (used to reach BLM roads and trailheads); and 166 miles (262 acres) that are administrative use only (which have very low vehicle volume, and are used as foot trails by the public). There are 68 miles of non-motorized trails. Construction of recreational facilities and mowing to maintain trailhead areas and trail segments that are prone to vigorous grass and forb growth could have similar noise impacts to YBC. However, noise disturbance from all of these activities (motorized travel, facility construction, and mowing) are expected to be infrequent and of short-term (less than 30 days) duration.

Dispersed recreation (e.g., backcountry camping, hunting, wood gathering) in more remote areas may result in some disturbance to YBC, and because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. To accommodate such recreational interest in the SPRNCA, over the life of the RMP, access to the San Pedro River could be increased to 17 locations. All 17 locations have trails that are currently used, but 5 do not yet have trailhead development. Disturbed ground associated with recreational activities may be more susceptible to colonization by invasive nonnative plants. Nonnative species may out-compete native species and introduced grasses also carry fire better and burn hotter than native species, which could degrade potential YBC habitat. While recreational activities may increase over time, recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, such as Escapule and Hereford, although some dispersed recreation will also continue to occur. Fewer than 50 backcountry permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), so adverse impacts to YBC from backcountry camping will likely be infrequent and temporary. In the future, numbers of backcountry users may increase, potentially resulting in more disturbance to YBC. Additionally, campers can start wildfires leading to damage to YBC habitat. To reduce the potential for these impacts, the BLM will require the use of stoves in the backcountry, and in designated campsites will locate fire rings away from riparian areas, although they may be near mesquite bosques used by YBC.

As part of travel management, about 202 miles on the SPRNCA route inventory (vehicle routes and trails for pedestrian, equine, and bike use) would be evaluated. If new travel routes in potential YBC habitat are designated (as part of travel management), then adverse impacts to habitat may occur and additional vehicle routes could increase noise and the risk of collision with YBC. Conversely, the decommissioning of travel routes will likely be beneficial for YBC and its habitat. Development of trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in YBC habitat, resulting in some level of additional adverse impacts similar to those discussed elsewhere in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA have not been determined. Potential impacts from travel management should be minimized as BLM plans to consider species protection when planning for new routes. The effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

The potential development of campgrounds, recreation sites (1), and planned trails (4 miles) together would result in long-term surface disturbance of an estimated 12 acres. Adverse effects



from human use of these developments may include compaction of soils, minor erosion and sedimentation into waterways, and reduced vegetation where trails are located and through some off-trail hiking. Recreational use on trails can cause them to become erosional features that could adversely affect YBC riparian habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge. However, most of these developments would occur outside of YBC habitat, and even if the 12 acres were in YBC habitat, this represents a very minimal amount (approximately 0.1 percent) of YBC habitat available within the action area. Additionally, increased trail monitoring and maintenance could prevent these adverse effects to YBC habitat. Site-specific effects of development would be determined during implementation planning and will be consulted on at that time.

### **Lands and Realty**

Overall, this RMP element, which includes managing lands to conserve their wildlife values, will likely benefit YBC. For example, closing the area to commercial energy development should be beneficial to YBC and its habitat, as it would exclude activities associated with such development, which could destroy or modify habitat and disturb YBC. Land acquisition of riparian or mesquite bosque habitat could also benefit YBC by conserving habitat for the species.

Some actions associated with Lands and Realty may adversely affect YBC. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. The renewal and possible changes to these ROWs could disturb YBC and impact its habitat. The Charleston Road ROW utility corridor runs through cottonwood-dominated riparian habitat, and the El Paso Gas Line and Tombstone Water Line cross riparian habitat, so possible changes made to their configuration could affect YBCs in the riparian corridor. Potential impacts to YBC could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations would be and if they will be implemented, however. Furthermore, maintenance of and access to existing utilities and ROWs could result in disturbance to YBC; however, these activities must be conducted in a manner that reduced impacts on SPRNCA resources. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in disturbance to YBC and modification of its habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over

small areas and for limited or intermittent periods, potential adverse effects on YBC from such activities will likely be minimal or avoided altogether.

### **Wild and Scenic Rivers**

The NWSRS goal is to preserve, protect, and enhance study river values on the SPRNCA. The management action to remediate hazardous material from abandoned mines could temporarily disturb YBC should they be near the project site; however, the overall action would have a beneficial effect on YBC by reducing direct exposure to contaminants or indirect exposure through the food chain.

### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect YBC are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction, farming, livestock grazing, mining, off-highway vehicle use, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in fragmentation, loss, or degradation of YBC habitat and disturbance to YBC. For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss and fragmentation habitat, as well as increased human presence and vehicular traffic that can disturb YBC and directly injure or kill them. The control of livestock from adjacent ranches without BLM leases is an ongoing issue, especially on the San Pedro River and St. David Ciénega. This activity is likely to adversely affect YBC and their habitat. State-regulated hunting and trapping could result in the removal of beaver from the river. The loss of beaver would have an adverse impact on recharge, reducing wetland water levels and stream flows resulting in modifications to potential YBC habitat.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur in the action area. These activities can also degrade YBC habitat and disturb YBC.

Furthermore, long-term drought and climate change are likely to result in impacts to water sources and vegetation used by YBC. Hotter, dryer condition also lead to greater risk of severe fire that could kill or displace YBC.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion**

After reviewing the current status of the YBC, the environmental baseline for the action area, the effects of the proposed SRPNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of YBC. Per our discussions, we jointly determined that the proposed action would not adversely modify or destroy proposed critical habitat for the YBC. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;
- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and
- Any future-project specific activities under the SPRNCA RMP that may affect YBC and its critical habitat will receive additional Service review and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this programmatic biological opinion are based on full implementation of the project as presented in the **Description of the Proposed Action** section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT— YBC**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed action described above is a “framework programmatic action” as defined in 50 CFR 402.02. In accordance with 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for a framework that does not authorize future actions; incidental take resulting from any action subsequently authorized, funded, or carried out under the program will be addressed in subsequent section 7 consultation, as appropriate. This biological opinion provides a broad-scale examination of the proposed action’s potential impacts on YBC, but we lack reasonable certainty of where, when, and how much incidental take may occur. Therefore, we have not quantified the amount and extent of incidental take that may result from the proposed action and have not exempted such take in this biological opinion.

### **CONSERVATION RECOMMENDATIONS — YBC**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that the BLM support YBC recovery through implementing and/or funding conservation actions, and, once a recovery plan or strategy is developed, implementing and/or funding recovery actions for YBC at that time.
2. We recommend that BLM conduct YBC protocol surveys in ephemeral side drainages with suitable habitat.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

## **STATUS OF THE SPECIES — HUACHUCA WATER UMBEL (*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

### **Listing History**

On January 6, 1997, we listed the Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*) as an endangered species (USFWS 1997); on July 12, 1999, we designated 83.2 km (51.7 miles) of streams or rivers in Cochise and Santa Cruz Counties, Arizona, as critical habitat (USFWS 1999a). A Five-Year Review of the taxon was finalized in August, 2014, and recommended no change to the classification of the taxon as endangered (USFWS 2014c).

### **Recovery Planning**

A Recovery Plan for the Huachuca water umbel was written in 2016 (USFWS 2016) and finalized in November, 2017 (USFWS 2017). The Recovery Plan identifies Recovery Criteria by which the taxon may be downlisted or delisted. The main strategy for the recovery of the plant is conservation of habitat by decreasing groundwater pumping, increasing water conservation and recharge, and protecting Huachuca water umbel occurrences and their seedbanks. One component of the recovery criteria include ensuring a minimum cumulative extent of 2,000 square meters (0.2 ha / 0.5 ac) of naturally occupied habitat exists in the San Pedro Watershed, 20 percent of which occurs in tributary streams, springs, or cienegas; this level of occupancy is sustained or improved for a minimum of 10 years over a 15 year period.

### **Terminology**

Because this taxon is clonal in nature and it is not practicable to identify individuals, the term “occurrence” is used herein to denote concentrations of this taxon within a distinct locality that are relatively distant from other concentrations. Occurrences are more likely to share underground root systems, and are often separated from one another by morphological or hydrological features. Within occurrences, clusters of stems separated by areas without stems are denoted herein as “patches.” An occurrence can consist of one to many patches; patches can have one or a few stems or form carpets of stems.

### **Biology**

Huachuca water umbel is a semi-aquatic to fully aquatic herbaceous perennial plant of the carrot family (Apiaceae). Hollow linear leaves that taper to a point are produced singly or in clusters at the top of short rhizomes. The leaves vary greatly in length from 2.5 to 33 centimeters (cm) (0.98 to 12.99 inches (in)) depending on their habitat, with shorter leaves typically found in dryer environments and longer when submerged in water (Coulter and Rose 1902, Affolter 1985, USFWS 2014a). Three to ten 1.0 to 2.0 millimeters (mm) (0.04 to 0.08 in) wide flowers are borne on an umbel that is always shorter than the leaves. Fruits are spherical and dry, 1.6 to 2.3 mm (0.6 to 0.09 in) long by 1.2 to 2.0 mm (0.04 to 0.08 in) broad, with five distinct spongy ribs that make the seeds buoyant and easily dispersed by water (Affolter 1985).

### **Life History**

Huachuca water umbel reproduces both asexually and sexually. Asexual reproduction, likely the primary form of reproduction in this taxon (Vernadero Group and the Desert Botanical Garden 2012), enable occurrences to rapidly expand or contract in size between years, seasons, or both, in response to local environmental conditions, including temperature and water availability (USFWS 1997, Vernadero Group 2011). Plants may also dislodge during flooding or other disturbance events, with clumps then possibly re-rooting in a different appropriate site along aquatic systems.

Flowering has been observed episodically between March and October, peaking in July and occurring with abundance irregularly (Warren et al. 1991). Germination occurs one to two weeks after seeds disperse (Gori 1995). Natural seed banks are important for the persistence of rare species, and observations in the field suggest Huachuca water umbel seed may remain viable for five to ten years, an important survival strategy during times of drought (Titus and Titus 2008a, Titus and Titus 2008b, Titus and Titus 2008c). Sexual reproduction may be important for maintaining genetic diversity, evolutionary potential, and persistence in the taxon. Research on sexual reproduction in captivity showed significantly higher fruit production in plants growing in flowing water versus those in a terrestrial situation, indicating that the best habitat to increase genetic variation is flowing water (Morrow 2015).

### **Genetics and Variability**

Historical numbers of unique individuals represented in clonal occurrences for the taxon is unknown. Vernadero Group and Desert Botanical Garden (2012) found that occurrences exhibit relatively low variability, with occurrences having 6-17 distinct genetic types, and generally more within occurrence variability than between occurrence variability. Existing occurrences are generally not dominated by a single clone. Genetic diversity/number of individuals represented in such intermixed clones may be significant in population dynamics and conservation (Harper 1977). Vernadero Group and Desert Botanical Garden (2012) note that conservation efforts should emphasize preservation of existing genetic diversity in Huachuca water umbel occurrences and the promotion of factors that will contribute to the establishment of new clones and/or sexually-produced seedlings, maintain dispersal pathways, and reduce habitat fragmentation.

### **Habitat**

Huachuca water umbel is restricted to ciénegas, rivers, streams, and springs in permanently wet (or nearly so) muddy or silty substrates with some organic content (USFWS 1999a). The taxon is generally found in shallow and slow-flowing waters that are relatively stable, or in active stream channels containing refugial sites where the plants can escape the effect of scouring floods (USFWS 1997, USFWS 1999a). In upper watersheds that generally do not experience scouring floods, Huachuca water umbel occurs in microsites where interspecific plant competition is low. At these sites, Huachuca water umbel occurs on wetted soils interspersed with other plants at low density, along the periphery of the wetted channel, or in small openings in the understory. In stream and river habitats, Huachuca water umbel can occur in backwaters, side channels, and nearby springs.

### **Distribution/Abundance**

Found between 855 and 2,170 meters (m) (2,805 and 7,120 feet) in elevation, the range of the taxon crosses the Sierra Madrean Region of southeastern Arizona and adjacent portions of Sonora, Mexico (Titus and Titus 2008c, Vernadero Group and the Desert Botanical Garden 2012). In the U.S., we are aware of 17 locations supporting extant occurrences of Huachuca water umbel, 8 locations where all Huachuca water umbel occurrences are considered extirpated, and 6 locations where no occurrences have been relocated in recent years. In the U.S., Huachuca water umbel occur on lands administered by the U.S. Army Fort Huachuca, Forest Service, BLM, USFWS, Arizona State Parks, Pima County, The Nature Conservancy, and private landowners. The majority of Huachuca water umbel occurs within the San Pedro River (percent of total range is 43.9) in the San Pedro Watershed, and the western Huachuca Mountains (percent of total range is 16.3) and Ciénega Creek in the Santa Cruz River Watershed, but also occurs at other locations (USFWS 2017). In Sonora, Mexico, we are aware of 21 locations supporting Huachuca water umbel occurrences, though most of these locations have not been revisited in recent years. In Mexico, most Huachuca water umbel occur on private lands of the San Pedro River and its tributaries in the San Pedro River Watershed (Anderson 2006). Huachuca water umbel also occurs within the Santa Cruz, Rio Yaqui, Rio Sonora, and Rio Concepcion watersheds in Mexico.

We are aware of many more occurrences of Huachuca water umbel than at the time of listing in both the U.S. and in Mexico, however, most occurrences do not appear to be increasing in size and many are reported from single patches among competing vegetation or in aquatic habitat that is in danger of being lost to groundwater pumping or drought. Many other occurrences have not been relocated in many years and are believed extirpated due to changes in suitability of habitat.

Along Cienega Creek and its tributaries, Huachuca water umbel occurrences have increased from one along Empire Gulch in 1991 to 100 in 2011, resulting from the spread of the taxon along Cienega Creek and colonization of Mattie Canyon (Simms, BLM, pers. comm. June 3, 2019). Additionally, it has been transplanted to one restored wetland next to St. David Cienega (SPRNCA) and one restored wetland next to lower Empire Gulch. It has also spread to two other restored wetlands adjacent to Empire Gulch, in the immediate area of the original transplant location.

### **Threats**

Threats to the taxon identified through research and consultations that could potentially impact Huachuca water umbel include: aquatic habitat degradation; wildfire and resulting sedimentation; invasive, non-native plant competition; livestock grazing; recreation; the effects of drought and climate change; and small occurrence size.

#### *Aquatic habitat degradation*

Human activities such as groundwater overdrafts, surface water diversions, impoundments, channelization, improper livestock grazing, agriculture, mining, sand and gravel operations, road building, non-native species introductions, urbanization, wood cutting, wildfires, and recreation all contribute to aquatic habitat loss and degradation within the historical range of Huachuca water umbel (Hendrickson and Minckley 1984, Bahre 1991, Hereford 1993).

### *Wildfire and resulting sedimentation*

Fire generally would not burn the wetland habitat of Huachuca water umbel due to high humidity; however, it has the potential to burn adjacent upland habitats causing indirect effects on Huachuca water umbel and its habitat throughout the range of the taxon (USFWS 2009). Effects include increased runoff of floodwaters, deposition of debris and sediment originating in the burned area, and potential for scouring of individual Huachuca water umbel plants and habitat (USFWS 2014b).

### *Invasive, non-native plant competition*

Invasive non-native plants have increased their presence within aquatic habitat of southeastern Arizona, and this invasion and expansion of infestations are expected to continue in the future. Because Huachuca water umbel is sensitive to competition from both native and non-native herbaceous plants, the continued increase in non-native species will lead to a decrease in the presence of Huachuca water umbel throughout the range of the taxon.

### *Livestock grazing*

Huachuca water umbel are affected by livestock grazing in the following ways: 1) trampling, 2) direct impacts from construction of range improvement projects, 3) changes in stream geomorphology that lead to erosion, sedimentation, and downcutting, 4) watershed degradation and resulting adverse effects to stream hydrology, and 5) consumption (USFWS 1999b; Anderson 2006). Observations of Huachuca water umbel response to grazing indicate the taxon is capable of experiencing light to moderate grazing with negligible impact (Edwards pers. comm. February 21, 2001; Anderson 2006; Simms pers. comm. October 26, 2011; Rorabaugh 2013). More intensive grazing or that during dry periods when cattle spend a disproportionate amount of their time, if not controlled, in riparian areas, may result in harmful effects to Huachuca water umbel and other riparian obligates (Krueper 1996; Edwards pers. comm. February 21, 2001; USFWS 2002; Malcom and Radke 2008; USFWS 2014a).

### *Recreation*

Riparian areas and ciénegas offer important recreational opportunities for the residents of southern Arizona and northern Sonora (USFWS 1997). This visitation is expected to increase in the future with increases in human population, as well as drought conditions and the desire to be near water. Recreational activities, if poorly managed, can result in soil compaction, streambank destabilization, erosion and sedimentation, increases in the presence of invasive non-native plant species, and trampling of Huachuca water umbel and other riparian plant species, thus reducing habitat quality.

### *Drought and climate change*

Huachuca water umbel evolved in the Southwest and has persisted in many locations throughout its range through historical droughts such as those of the 1950s, yet, given the severity and persistence of the present multi-decade drought (Bowers 2005, Garfin et al. 2013, CLIMAS 2014), it is unknown how long Huachuca water umbel will maintain viability in de-watered habitat. It has been suggested that seed from this taxon may persist for five to ten years in such situations (Titus and Titus 2008a, Titus and Titus 2008b, Titus and Titus 2008c). Projections for the southwestern U.S. are that precipitation will be less in the future (Seager et al. 2007, Karl et al. 2009) and that temperatures will rise (Karl et al. 2009, Overpeck et al. 2012). In addition, in a



warmer environment, an enhanced hydrologic cycle is expected; rainfall events are to be less frequent, but more intense, and larger flood events more common (Karl et al. 2009). Such large floods can destroy Huachuca water umbel patches, and even entire occurrences, if no niches in backwaters are present to ensure recolonization.

#### *Small occurrence size*

Habitat degradation over historical time has resulted in decreased number and size of Huachuca water umbel occurrences, potentially decreasing viability and genetic diversity of these occurrences. Occurrences are in many cases isolated, which makes the chance of natural recolonization after extirpation less likely. The clonal nature of the taxon, combined with small patch sizes, may result in less genetic diversity than in a non-clonal species, further aggravating vulnerability. The work of the Vernadero Group and the Desert Botanical Garden (2012) indicates that the taxon is vulnerable to extinction as a result of stochastic events that are often exacerbated by habitat disturbance. For instance, the restriction of Huachuca water umbel to a relatively small area in southeastern Arizona and adjacent areas of Mexico increases the chance that a single environmental catastrophe, such as a severe tropical storm or drought, could eliminate many occurrences or cause extinction.

#### **Critical Habitat**

Seven critical habitat units have been designated for Huachuca water umbel; all are in Santa Cruz and Cochise counties, Arizona, and include stream courses and adjacent areas out to the beginning of upland vegetation. Unit 1 and part of Unit 2 is on private land; Units 3, 4, and 6 are within the Coronado National Forest (U.S. Forest Service); Unit 5 is within Fort Huachuca (U.S. Army); and Unit 7 is primarily within the SPRNCA (BLM). The following general areas are designated as critical habitat (see legal descriptions for exact critical habitat boundaries):

- Unit 1 Approximately 1.25 mile of Sonoita Creek southwest of Sonoita;
- Unit 2 Approximately 2.7 miles of the Santa Cruz River on both sides of Forest Road 61, plus approximately 1.9 miles of an unnamed tributary to the east of the river;
- Unit 3 Approximately 3.4 miles of Scotia Canyon upstream from near Forest Road 48;
- Unit 4 Approximately 0.7 mile of Sunnyside Canyon near Forest Road 117 in the Huachuca Mountains;
- Unit 5 Approximately 3.8 miles of Garden Canyon near its confluence with Sawmill Canyon;
- Unit 6 Approximately 1.0 mile of Rattlesnake Canyon and 0.6 mile of an unnamed canyon, both of which are tributaries to Lone Mountain Canyon; approximately 1.0 mile of Lone Mountain Canyon; and approximately 1.0 mile of Bear Canyon; an approximate 0.6-mile reach of an unnamed tributary to Bear Canyon; and
- Unit 7 Approximately 33.7 miles of the San Pedro River from the perennial flow reach north of Fairbank (Arizona Department of Water Resources 1991) to 0.13 mile south of Hereford, San Pedro Riparian National Conservation Area (on the SPRNCA, BLM).

The primary constituent elements (PCE) of critical habitat for Huachuca water umbel include, but are not limited to, the habitat components that provide:

1. Sufficient perennial base flows to provide a permanently or nearly permanently wetted substrate for growth and reproduction of Huachuca water umbel;

2. A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for Huachuca water umbel expansion;
3. A riparian plant community that is relatively stable over time and in which non-native species do not exist or are at a density that has little or no adverse effect on resources available for Huachuca water umbel growth and reproduction; and
4. In streams and rivers, refugial sites in each watershed and in each reach, including but not limited to springs or backwaters of mainstem rivers that allow each occurrence to survive catastrophic floods and recolonize larger areas.

Activities that may destroy or adversely modify critical habitat include those that alter the primary constituent elements to the extent that the value of critical habitat for both the survival and recovery of Huachuca water umbel is appreciably diminished. Such activities are also likely to jeopardize the continued existence of the species.

#### **ENVIRONMENTAL BASELINE — HUACHUCA WATER UMBEL (*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

#### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of this analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above. The proposed action overlaps the range of the Huachuca water umbel and critical habitat Unit 7.

#### **Status of the species and critical habitat within the action area**

The area of occupied and formerly occupied Huachuca water umbel habitat along the San Pedro River and Babocomari River and tributaries represents about 50 percent of the total range of the species (USFWS 2017), indicating the importance of these areas to persistence of the species. The Huachuca water umbel occurs in perennial portions of the San Pedro River along the toe of river banks, where it can remain in wet soil throughout the year. As explained in the 2017 Recovery Plan for *L. schaffneriana* ssp. *recurva* (USFWS 2017), multiple occurrences of the Huachuca water umbel have been documented over roughly 34 miles of the San Pedro River near Sierra Vista on the SPRNCA. Most occurrences observed in 2010 were sparsely populated

and threatened by competitive exotic plants and habitat erosion. The most abundant occurrence is found south of Highway 90, and monitoring personnel observed that areas with higher concentrations remained high from one monitoring period to the next. This area is impacted through groundwater draw-down from Fort Huachuca, the city of Sierra Vista, agriculture use, and the Cananea Mine in Sonora. More recently (2018), several occurrences have been lost to desiccation near Hereford and the Highway 90 Bridge (BLM 2019). The trend along the river appears to be declining due to a decrease in surface water permanence noted in some locations. In contrast, this species has been grown offsite and transplanted to three locations where they are now self-sustaining: Little Joe Wetland, Murray Spring (Curry Draw) and Horsethief Draw. These occurrences have expanded in extent from the time they were planted over 5 years ago (BLM 2019).

In the Babocomari River, the species is present on private land between two sections of the SPRNCA but has not been observed on BLM-administered lands. It has been transplanted to Little Joe Wetland, Murrays Springs, Horsethief Draw, and Frog Spring, where self-sustaining occurrences may become established (BLM 2017). In the case of Little Joe, it has established an extensive occurrence, but its extent limited largely by soil moisture and the density of invasive bulrush thickets.

#### *Critical habitat*

As stated in the Status of the Species section above, the SPRNCA contains one critical habitat unit for the Huachuca water umbel (Unit 7; Figure 2). Huachuca water umbel Critical Habitat Unit 7 includes approximately 33.7 miles of the San Pedro River from the perennial flows reach north of Fairbank to 0.13 miles south of Hereford on the SPRNCA in Cochise County. Approximately 29 acres, or 5 percent, of Unit 7 are privately owned, and 480 acres, or 95 percent, are in federal ownership on the SPRNCA, which the BLM manages. Units 5 and 6 also occur within the Upper San Pedro Watershed.

#### *Threats*

The threats to the Huachuca water umbel in the action area are similar to those rangewide. The most significant long-term threats to the species are aquatic habitat degradation, including unsustainable groundwater withdrawal; the effects of drought and climate change; wildfire and resulting sedimentation and scouring; invasive, nonnative plant competition; and poorly managed livestock grazing. The 2017 Recovery Plan for Huachuca water umbel extensively discusses threats to the species in the upper San Pedro watershed. Among other conclusions, the recovery plan found that groundwater withdrawals have, and likely will, threaten the long-term persistence of the species in the upper San Pedro watershed.

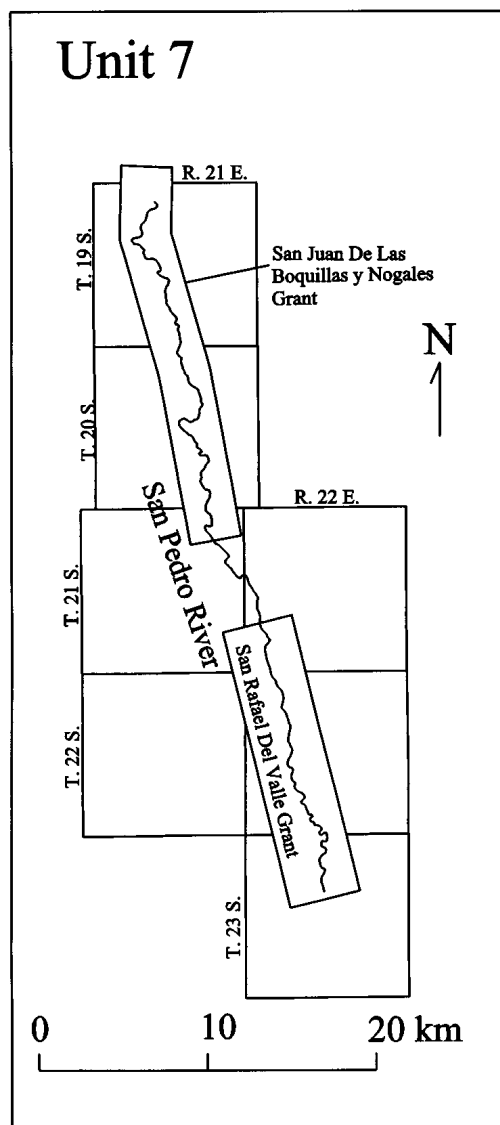
#### *Planning and Conservation Efforts*

The 2017 Recovery Plan for *L. schaffneriana* ssp. *recurva* discusses extensive planning and conservation efforts that have been made for the species. Among these efforts, the species was successfully established at three locations (Little Joe Wetland, Murray Springs, and Horsethief Draw) with suitable habitat on the SPRNCA.

#### *Past and Ongoing Federal Actions in the Action Area*

Forty-eight projects have undergone formal section 7 consultation for effects to Huachuca water umbel in the U.S., with many actions (e.g., fuels management, military operations, grazing) occurring in the Upper San Pedro watershed (see the Arizona Ecological Services Office [section 7 website](#) for these consultations). While these federal actions resulted in adverse effects to the species, the consultations also included measures to reduce adverse effects on the taxon, such as introduction of the taxon into stock tank and other suitable habitat, and non-native species management to decrease competition, and resulted in non-jeopardy determinations.

**Figure 2.** Huachuca water umbel critical habitat Unit 7 along the San Pedro River, Arizona.



#### *Summary of the Status of the Species in the Action Area*

While conservation efforts have been made for this species in the action area, we think the aggregate effects of 1) aquatic habitat degradation, including unsustainable groundwater withdrawal; 2) the effects of drought and climate change; 3) wildfire and resulting sedimentation

and scouring; 4) invasive non-native plant competition; and 5) poorly managed livestock grazing have contributed to the declining status of the species in the action area.

### **EFFECTS OF THE ACTION — HUACHUCA WATER UMBEL (*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The riparian plant community on the SPRNCA is extensive (~1,560 acres), but only a relatively small part of this habitat (i.e., the area that supports perennial water) is likely suitable for Huachuca water umbel or has the potential to become suitable over the life of the plan, especially if restoration activities are carried out and are successful. We anticipate that the proposed action, the SPRNCA RMP, will result in net beneficial effects on Huachuca water umbel by maintaining and managing for open space and restoring wetland habitat and stream channel function for the species. Overall, such management should continue to provide habitat to support Huachuca water umbel and RMP actions like reintroducing, transplanting, or augmenting Huachuca water umbel will clearly benefit the status of the species and contribute to its recovery. That said, individual components of the SPRNCA RMP are likely to adversely affect Huachuca water umbel; these effects are discussed in the RMP components' sections below. In summary, components of the proposed action may result in damage or mortality of plants and habitat degradation (e.g., from livestock grazing and trampling, recreation in open water, and use of groundwater). Implementation of conservation measures, such as avoiding RMP activities in areas occupied by Huachuca water umbel, would minimize risk of impacts to the species and its habitat.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on Huachuca water umbel in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level section 7 consultations. Furthermore, potential adverse effects associated the RMP may be minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

The aim of the analysis below is to point out activities in the RMP that may affect Huachuca water umbel and discuss the general types of effects these activities may have on the species. In some cases, management actions lack detail (e.g., Review and assess water needs for resources managed on the SPRNCA and acquire and perfect new water rights as deemed necessary for management) to understand if they will have associated on-the-ground activities that may affect Huachuca water umbel. In these cases, we assume the management action will not affect

Huachuca water umbel and that possible effects that were unforeseen at the programmatic level will be addressed by BLM in future implementation level consultations.

### **Air Quality**

No effects on Huachuca water umbel are likely from management of air quality.

### **Soils and Watershed Management**

All of the soils and watershed management goals and objectives are related to maintaining, restoring, or improving watershed integrity function; they are anticipated to contribute to the long-term persistence and improvement of Huachuca water umbel habitat located in riparian areas or wetlands on the SPRNCA, and potentially downstream of the SPRNCA. The types of projects associated with the soils and watershed program are typically those that improve the function and physical condition of the vegetation and the soil in both upland habitat types and in riparian habitats. These projects, in conjunction with management actions related to vegetation management, are expected to improve the condition of wetlands and riparian areas to meet the habitat requirements for Huachuca water umbel.

Management actions to control sheet, rill, and gully erosion on an estimated 5,040 acres are likely to improve watershed health in ways that improve the function of the hydrologic cycle, affecting recharge of groundwater and moderation of flood peaks. This would reduce scour and improve surface water retention thereby providing more potential habitat for Huachuca water umbel. Recharge is improved further by implementing recharge enhancement projects on an estimated 2,170 acres of ephemeral tributaries. While Huachuca water umbel does not occur on these ephemeral tributaries, water recharge in the watershed will generally have a beneficial effect on Huachuca water umbel habitat on the San Pedro River by raising the water table. Watershed projects are not anticipated to be implemented in Huachuca water umbel habitat, therefore should not directly adversely affect the species.

Existing surface disturbances within Huachuca water umbel habitat are about 100 acres and the area with human-made structures slated for removal is about 50 acres, based on an inventory of existing locations and the stream channel condition. Because the removal of these structures is likely to be near or in occupied Huachuca water umbel habitat, some patches or suitable habitat could be damaged or lost in small quantities in or on the periphery of individual project sites. The rehabilitation (e.g., dismantle or alter) of human-made structures (e.g., agricultural dikes and berms, railroad grades, and ditches and diversions) for the purpose of restoring hydrological function, especially as it relates to recharge, should improve channel, floodplain, and riparian function in Huachuca water umbel habitat. Subtle changes in the hydraulics can change local erosion and deposition dynamics; this can have both beneficial and adverse effects on Huachuca water umbel by altering suitability of habitat patches (i.e., sometimes habitat can be created and sometimes it is destroyed by subtle changes in erosion and deposition dynamics). For example, bank extensions that have formed as a result of channel narrowing from deposition in areas with sedges and rushes may be lost, and new ones may develop downstream of locations where bank structures are removed. The modification of roads and trails affecting watershed health and function should improve watershed conditions and would be additive to other beneficial effects of watershed restoration.

While the net effect of Soils and Watershed Management on Huachuca water umbel and its habitat is anticipated to be beneficial, some adverse effects, such as loss of habitat and patches of Huachuca water umbel, are possible. These impacts, however, are likely to be temporary as disturbed areas will be rehabilitated for Huachuca water umbel. Damage to occupied patches of habitat and suitable habitat can be reduced if avoidance and other measures are implemented. Loss of Huachuca water umbel and the risk of flood-induced erosion from project activity can be remediated through reclamation of the site. Should the species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of damage to individual patches would increase. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species. Specific locations and acres to be treated in Huachuca water umbel habitat and specific effects will be determined during the project implementation planning process.

### **Water Management**

Water management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. Related management actions should benefit Huachuca water umbel and habitat through groundwater protection and conservation, which directly affect habitat quality and long-term persistence. Perfecting and defending water rights should protect water availability, which is foundational to maintaining the riparian-wetland ecosystem that supports Huachuca water umbel. While water management should benefit Huachuca water umbel, some aspects (i.e., groundwater use, pumping of groundwater to augment surface water) could have adverse effects on the species depending on the scale and duration of the activity. Adverse impacts on Huachuca water umbel on the SPRNCA are anticipated to be insignificant from activities related to water management; however, in the larger context of cumulative impacts in the basin, they are additive to the adverse effects that led to the need to list the species from large-scale groundwater extraction.

Current water use associated with administrative, livestock, recreational, and private activities is 17.83 acre-feet per year and projected use is 17.17 acre-feet per year. Water conservation will be achieved by designing water supply systems for administrative use, livestock, and recreation to minimize groundwater pumping. For example, BLM will periodically assess existing potable water systems to determine if any systems should be decommissioned or modified. BLM will also switch livestock waters from the traditional earthen stock tanks to covered water storage tanks and troughs; this is anticipated to save 0.46 acre-feet per year (the projected consumption of water for livestock is anticipated to be 0.64 acre-feet per year (from 1.10 acre-feet current use). With the exception of the private use of BLM wells at Hereford (which currently use and are projected to use 15 acre-feet per year), all other projected uses combined equal 2.17 acre-feet with well locations distributed widely, leading to a low potential for effects to the Huachuca water umbel habitat. That said, the total projected water use may impact habitat that support Huachuca water umbel. Excluding authorization of the use of groundwater from uses tied to realty actions, will protect Huachuca water umbel from activities that could reduce groundwater volume or elevation.

Short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on Huachuca water umbel, but could possibly result in longer term adverse effects. If conditions

indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS to reduce potential adverse effects that may become apparent once details of the activity are known.

While the Water Management element of the RMP will largely be beneficial for Huachuca water umbel, the private use of a BLM well near Hereford that draws 15 acre-feet of water annually would have an adverse effect on Huachuca water umbel habitat through the potential to capture groundwater that provides surface flow. The 10- and 50-year estimated capture of the water by this well that would otherwise be available for riparian plants or surface flow for the Hereford reach of the San Pedro River is approximately 60 and 90%, respectively (USGS 2008).

### **Vegetation Management: All Vegetation Communities, including Chihuahuan Desert Scrub and Grasslands**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should benefit Huachuca water umbel. Huachuca water umbel habitat in rivers, streams, and wetlands depends on the overall health and function of the larger ecosystem that supplies water, sediment, and nutrients to these areas. While most of the vegetation treatments will occur in the uplands away from Huachuca water umbel habitat, they are anticipated to have long-term, indirect beneficial effects on riparian vegetation that supports Huachuca water umbel. For example, the use of biological (e.g., targeted livestock grazing, insects), mechanical, prescribed fire, and chemical management (i.e., Integrated Vegetation Management Plan) to suppress, control, and/or eliminate invasive species and noxious weeds has the potential to protect Huachuca water umbel habitat. Similarly, the use native trees, shrubs, herbs, and seed mixes for restoration will help maintain the overall ecological integrity of treated sites following restoration of floodplain habitats adjacent to Huachuca water umbel habitat.

Nonetheless, vegetation management may result in some short-term adverse effects on Huachuca water umbel, such as increased sediment and increased peak flows. Additionally, treatments near riparian or wetland habitat could damage Huachuca water umbel patches and suitable habitat. However, a variety of conservation measures will be used to reduce the risk of adverse effects on Huachuca water umbel from vegetation treatments. Some of the primary conservation measures include the following:

- Use spot treatment application of herbicide where practical;
- Create treatment buffers between the herbicide treatment area and Huachuca water umbel habitat; and
- Use GPS-guided delivery when using spray or pellets on days with little or no wind.

About 27,460 acres of vegetation may be treated as part of this RMP element; this area includes private and state-administered land within the SPRNCA boundary. The estimates of acreage by specific treatment type, for all vegetation types are prescribed fire 17,070; mechanical 6,130; herbicide 11,040 (the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). The USFWS and BLM consulted on the effects to Huachuca water umbel from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). The proposed action under the RMP is to continue



prescribed fire as detailed in the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Biological Opinion. Therefore, the effects of prescribed fire will not be addressed in this RMP consultation.

### **Vegetation Management Specific to Riparian Areas and Wetlands**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and wetland vegetation management, which generally aims to protect, maintain, restore, and improve riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to Huachuca water umbel and its habitat. However, implementation of some riparian and wetland vegetation management projects (e.g., vegetation and channel treatments) may result in localized, short-term adverse effects to Huachuca water umbel and its habitat (e.g., trampling or otherwise crushing plants or entire patches, and localized changes in the wetland and riparian vegetation type and densities). Should the species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of damage to individual patches would increase. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

It is anticipated that 10 acres of riparian vegetation along the San Pedro River and more than 10 acres of ciénega habitat would be treated over the life of the plan. St. David Ciénega, man-made wetlands fed by artesian wells at the three Dunlavy wetlands, and three other locations would have vegetation management using fire, excavation, chemicals, mechanical manipulation, and plantings, including Huachuca water umbel. Such planting are likely to improve the status of the species in the SPRNCA.

Additionally, the use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation, and loss or damage to habitat. Limited and targeted (i.e., spot treatments) use of herbicide is likely to have less impact to Huachuca water umbel than blanket spraying, which could destroy occurrences of the taxon. Details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required.

The limited use of herbicide and mechanical vegetation treatments in riparian areas to restore riparian function may improve habitat conditions in the long-term. These treatments could also have short-term impacts on Huachuca water umbel, however, potential adverse effects of would be lessened or eliminated through the incorporation of conservation measures in project plans. Important conservation measures for wetland and riparian vegetation projects may include the following:

- Use of spot treatments of individual plants;
- Use of herbicides that can be safely applied in aquatic areas;
- Use of minimum tools to reduce the project footprint and effects;

- Use of heavy equipment equipped for low-pressure contact with the earth;
- Use of methods and techniques that are designed to maintain site stability during restoration activities; and
- Institution of appropriate timing restrictions to periods when bank soils are dry and less susceptible to damage.

Wetlands are part of the hydrologic cycle that is interconnected by groundwater with riparian habitat that Huachuca water umbel uses. By protecting and restoring sensitive wetland ecological sites and surrounding areas adjacent riparian habitat that support Huachuca water umbel would be maintained or improved through wetland hydrological processes. As part of the RMP, ciénegas may be created or enhanced where artesian water sources have already been developed. Maintaining and restoring natural (St. David Ciénega) and artificial artesian-fed wetlands (Dunlavy 1, 2, 3; Whitehouse Wetland; and Kolbe Wetland) would likely include excavating, mechanical control of vegetation surrounding open water, occasionally burning, and applying herbicides to individual plants for removal. Huachuca water umbel could benefit from restoration of these habitats if the species is introduced after restoration. Restoration has been done successfully at Little Joe Spring (Little Joe Wetland), which now supports an extensive occurrence of Huachuca water umbel.

Riparian and wetland habitat loss and degradation is a major threat to the riparian-dependent species like the Huachuca water umbel. As part of riparian vegetation management, channel treatments would be used to improve geomorphology, which is the foundation for riparian processes, including overbank flooding (recharge), riparian vegetation establishment, riparian plant species and age diversity, aquatic habitat diversity, and wetland creation. Stream channel geomorphology would also be enhanced by installing soft structures, such as vegetation or posts, in streams to increase meandering and sinuosity.

Effects from these treatments would initially disturb Huachuca water umbel habitat through scour as meanders form, which induces erosion on the outside of channel bends. However, the channel treatments coupled with vegetation treatments would have long-term beneficial effects on the habitat by promoting the development of channel processes that are more dynamic and the development of vegetation communities with a greater diversity of vegetation types and age classes of trees, shrubs, grasses, and forbs, including Huachuca water umbel. Additionally, treatments would be carried out in phases over several years and monitored to help instruct adaptive management to improve effectiveness and reduce any adverse effects observed to the habitat.

To protect riparian vegetation, new recreation developments would have to be designed to minimize effects on riparian vegetation; this would limit the potential for adverse effects on Huachuca water umbel and its habitat. For example, by limiting foot trails to the upper banks and spur tails on lower banks to short segments along stream courses, bank stability would be maintained. Bank stability is fundamental to the function of existing riparian vegetation that supports Huachuca water umbel habitat on the SPRNCA. The maintenance of existing firebreaks (addressed in the Wildland Fire and Management Section) would additionally protect large tracts of riparian habitat from loss due to wildfire.

The use of livestock-proof fencing (steel tubing construction) around the perimeter of restored and constructed artificial wetland ponds would help maintain habitat integrity (e.g., bank sheering and clay soil compaction) and reduce the loss of plants from livestock that enter these areas when barbed wire fences in surrounding areas are down.

### **Vegetation Management specific to Sandy Washes (Xeric Riparian)**

No effects to Huachuca water umbel are likely from management of xeric riparian habitat.

### **Fish, Wildlife, and Special Status Species**

This RMP element, including, managing for priority species and supporting, maintaining, and restoring habitat and habitat connectivity is likely to have beneficial effects on the Huachuca water umbel. However, some activities associated with implementation of this element, may adversely affect Huachuca water umbel.

The continued management of beaver populations, including augmentations, on the San Pedro River will result in the continued localized increases in the water table, which should promote the long-term establishment of riparian habitat and create ciénega-like habitat that benefit Huachuca water umbel. The protection of springs and the associated vegetation for wildlife should allow for the management of these habitats for the recovery of Huachuca water umbel. Additionally, the restoration of natural ciénegas, artificial wetlands, and other habitats may benefit Huachuca water umbel if restoration results in these sites supporting suitable habitat for the species. Finally, the establishment of new Huachuca water umbel occurrences and augmentation of existing ones as prescribed in the RMP will have beneficial effects on Huachuca water umbel by improving the species resiliency (increased numbers) and redundancy (increased occurrences).

Work related to the fish barriers on Murray Springs and Government Draw for the protection of federally listed fish and aquatic wildlife species may occur in locations that eventually support patches of Huachuca water umbel. Adverse effects, such as trampling and soil disturbance, may lead to erosion of habitat during flood events following construction or maintenance of these structures.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210), and therefore, these effects will not be addressed in this RMP consultation.

SPRNCA will continue to have an estimated 610 acres of firebreaks, of which 580 acres are on BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. Any effects on federally listed species and critical habitat were already considered in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion 02EAAZ00-2015-F-0431) and therefore will not be addressed in this biological opinion.

**Cultural Resources**

No effects on Huachuca water umbel are likely from management of work related to the stabilization and rehabilitation of cultural sites, as this species requires riparian and wetland habitat that is located well away from cultural features.

**Native American Concerns**

Collection of plants by local Native American tribes may result in a short-term (minutes to a few hours) disturbance (light trampling) of Huachuca water umbel on an infrequent basis over the life of the plan.

**Visual Resources**

No effects on Huachuca water umbel are likely from management of visual resources.

**Paleontological Resources**

No effects on Huachuca water umbel are likely from management of visual resources.

**Livestock Grazing**

The USFWS and BLM consulted on the effects to Huachuca water umbel from livestock grazing on the four SPRNCA allotments through the consultation on the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414). In 2008, the BLM and USFWS concluded consultation on the effects of livestock grazing and other activities on newly established occurrences of Huachuca water umbel related to Aquatic Species Conservation at the San Pedro Riparian and Las Ciénegas National Conservation Areas, Arizona (#22410-2008-F-0103). The proposed action is to continue grazing as was consulted on in the consultations cited above. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation.

**Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and education opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to result in short- and long-term adverse effects to the Huachuca water umbel; however, the education component of recreation management may benefit the Huachuca water umbel by providing information to the public about species and resource conservation.

Because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. To accommodate such recreational interest in the San Pedro, over the life of the RMP, access to the San Pedro River could be increased to 17 locations. All 17 locations have trails that are currently used, but 5 do not yet have trailhead development. While recreational activities may increase over time, recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, such as Escapule and Hereford, although some dispersed recreation will also continue to occur. Adverse effects to the species

from recreational activities may include trampling, or otherwise crushing plants or entire patches, soil disturbance that may lead to erosion of habitat during flood events and sedimentation into waterways, soil compaction, and reduced vegetation, especially where trails are located on the toe of floodplains and river banks.

Recreational use on the SPRNCA can cause trails from becoming erosion features that could adversely affect Huachuca water umbel habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge. Trails have become incised in the past due to human use; however, increased trail monitoring and maintenance could prevent adverse effects to Huachuca water umbel from continued and possibly increased trail use.

Dispersed recreation (e.g., backcountry camping, hunting, wood gathering) in more remote areas may result in some light trampling of Huachuca water umbel that the plants can likely withstand. Backcountry camping may result in impacts to Huachuca water umbel and its habitat; however, because less than 50 backcountry permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), we anticipate that adverse impacts will occur infrequently in Huachuca water umbel habitat along the San Pedro River and that such impacts will be temporary. In the future, numbers of backcountry users may increase, potentially resulting in increased trampling of Huachuca water umbel and damage to vegetation and soils in Huachuca water umbel habitat. Campers can start wildfires leading to damage to Huachuca water umbel and its habitat. However to protect riparian vegetation and species from potential wildfire starts, designated campfire locations with fire rings are placed well away from this vegetation type. In backcountry areas, campers would have to choose a location and build their own fire ring, which may increase the risk of accidental fire starts. When weather conditions are hot and dry, fire restrictions would be put in place to reduce the risk of accidental wildfire starts.

The area of riparian habitat that may be affected (e.g., through bank trampling and capture of flood flows by trails that can change the aquatic habitat character) by recreational activities on road and trails is estimated at 605 acres of Fremont cottonwood-Goodding's willow vegetation type. Within this area, only a small amount of suitable habitat for Huachuca water umbel occurs. Because the species grows in the water and muddy portions of banks, people will likely avoid most locations occupied by Huachuca water umbel.

In addition to the impacts from recreational users (hikers, etc.), a total of 6 acres are planned for development in areas adjacent to Huachuca water umbel habitat. These include 1) 4.8 acres of new campgrounds and recreation sites; and 2) 4 miles (1.2 acres) of planned trails. However, the actual number and location of trails could change based on implementation-level travel management planning. Surface disturbance caused by these developments could result in indirect impacts to Huachuca water umbel and its habitat through erosion, as well as increased use of the developments by recreational users that could result in trampling of plants, bank trampling, etc.

Maintenance of existing and new trails should benefit Huachuca water umbel by preventing or minimizing erosion and sedimentation of habitat. Mowing to maintain trailhead areas and trail

segments that are prone to vigorous grass and forb growth are not anticipated to affect Huachuca water umbel as mowing will not occur near stream banks and aquatic habitat.

Motorized travel is allowed within the SPRNCA and 175 total miles of roads (276 acres), including 1) 9 miles (14.2 acres) that are open to the public; 2) 6.6 miles (10.4 acres) that are open to the public through lease from the Arizona State Land Department (used to reach BLM roads and trailheads); and 3) 166 miles (262 acres) that are administrative use only (which have very low vehicle volume, and are used as foot trails by the public). There are 68 miles of non-motorized trails. Motorized vehicle use associated with recreation management could adversely affect Huachuca water umbel habitat through erosion into Huachuca water umbel habitat and spread on non-native species. No off-road vehicle travel is permitted, thus no direct impacts to potential Huachuca water umbel habitat are anticipated.

As part of travel management, about 202 miles on the SPRNCA route (trails and roads) inventory would be evaluated. If new travel routes in potential habitat are designated (as part of travel management), then impacts to habitat may occur. Conversely, the decommissioning of travel routes will likely be beneficial for Huachuca water umbel habitat. Development of non-motorized trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in habitat that Huachuca water umbel occupies, resulting in some level of additional adverse impacts similar to those discussed elsewhere in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA has not been determined. Potential impacts from travel management should be minimized as BLM plans to consider species protection when planning for new routes. The effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

Should the species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of damage to individual patches from recreational and travel management activities would increase. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

### **Lands and Realty**

Overall, this RMP element which includes managing lands to conserve their aquatic and riparian values, will likely benefit the Huachuca water umbel. For example, closing SPRNCA to commercial energy development should be beneficial to the species, as it would exclude activities associated with such development, which could destroy or modify habitat. Land acquisition may benefit the conservation of Huachuca water umbel depending on the location of parcels acquired.

Some actions associated with Lands and Realty may adversely affect Huachuca water umbel. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. Ongoing operation and maintenance of these ROWs could result in adverse effects to Huachuca water umbel where they intersect or are near suitable habitat. Additionally, the

renewal and possible changes to these ROWs could damage Huachuca water umbel and degrade its habitat.

Maintenance activity near the El Paso Gas Line and Tombstone Aqueduct also has the potential to cause adverse effects from trampling occupied Huachuca water umbel locations or destabilizing habitat, which may predispose it to erosion (loss). The Charleston Road ROW utility corridor runs through cottonwood-dominated riparian habitat and the El Paso Gas Line and Tombstone Aqueduct cross riparian habitat, so possible changes made to their configuration could affect water umbel in the future as the occurrence expands from transplanting the species to new areas. Potential impacts to Huachuca water umbel from renewing existing ROWs could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations are and if they will be implemented, however. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in impacts to Huachuca water umbel and its habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects to Huachuca water umbel from such activities will likely be minimal or avoided altogether.

Should the species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of damage to individual patches would increase as a result of implementing Lands and Realty activities. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

### **Wild and Scenic Rivers**

The Wild and Scenic Rivers goal is to preserve, protect, and enhance study river values on the SPRNCA. The Wild and Scenic River management action to remediate hazardous material from abandoned mines is anticipated to have a beneficial effect on Huachuca water umbel and its habitat through the reduction of direct exposure to contaminants, including copper, washed into streams, springs, and wetlands.

## **EFFECTS ANALYSIS FOR HUACHUCA WATER UMBEL CRITICAL HABITAT**

Critical habitat within Unit 7 includes about 33.7 miles of the San Pedro River from the perennial flow reach north of Fairbank to 0.13 mile south of Hereford. For Huachuca water

umbel critical habitat, the effects analysis approach identifies how the primary constituent elements (PCE) are likely to be affected by the proposed action. The PCEs of critical habitat for Huachuca water umbel include, but are not limited to, the habitat components that provide:

1. Sufficient perennial base flows to provide a permanently or nearly permanently wetted substrate for growth and reproduction of Huachuca water umbel;
2. A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for Huachuca water umbel expansion;
3. A riparian plant community that is relatively stable over time and in which non-native species do not exist or are at a density that has little or no adverse effect on resources available for Huachuca water umbel growth and reproduction; and
4. In streams and rivers, refugial sites in each watershed and in each reach, including but not limited to springs or backwaters of mainstem rivers that allow each occurrence to survive catastrophic floods and recolonize larger areas.

Overall, beneficial effects to Huachuca water umbel critical habitat are anticipated due to maintaining and managing for open space and restoring wetland habitat and stream channel function. That said, direct and indirect adverse effects to critical habitat are anticipated from various RMP components, such as grazing.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on Huachuca water umbel critical habitat in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level section 7 consultations. Furthermore, potential adverse effects associated the RMP may be avoided or minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

The aim of the analysis below is to point out activities in the RMP that may affect Huachuca water umbel critical habitat and discuss the general types of effects these activities may have on PCEs. In some cases, management actions lack detail to understand if they will have associated on-the-ground activities that may affect Huachuca water umbel critical habitat. In these cases, we assume the management action will not affect Huachuca water umbel and that possible effects inadvertently overlooked at the programmatic level will be addressed by BLM in future implementation level consultations.

### **Air Quality**

No effects on Huachuca water umbel critical habitat are likely from management of air quality.

### **Soils and Watershed Management**

All of the soils and watershed management goals and objectives are related to maintaining, restoring, or improving watershed integrity function and are anticipated to benefit critical habitat for the Huachuca water umbel. The types of projects associated with the soils and watershed program are typically those that improve the function and physical condition of the vegetation and the soil in both upland habitat types and in riparian habitats. These projects, in conjunction



with management actions related to vegetation management, are expected to improve the condition of wetlands and riparian areas to meet the habitat requirements for Huachuca water umbel (PCE-1, PCE-2, and PCE-3).

Management actions to control sheet, rill, and gully erosion on an estimated 5,040 acres are likely to improve watershed health in ways that improve the function of the hydrologic cycle, affecting recharge of groundwater and moderation of flood peaks in CH (PCE-2 and PCE-3). This would reduce scour and improve surface water retention thereby providing more potential habitat for Huachuca water umbel. Recharge is improved further by implementing recharge enhancement projects on an estimated 2,170 acres of ephemeral tributaries (PCE-1). While Huachuca water umbel does not occur on these ephemeral tributaries, water recharge in the watershed will generally have a beneficial effect on Huachuca water umbel critical habitat on the San Pedro River by raising the water table. Watershed projects are not anticipated to be implemented in Huachuca water umbel critical habitat, therefore should not directly adversely affect the PCEs in critical habitat.

The area with human-made structures slated for removal is about 50 acres, based on an inventory of existing locations and the stream channel condition. Because the removal of these structures is likely to be near or in Huachuca water umbel critical habitat, some small stretches of critical habitat could be degraded in or near the periphery of individual project sites, adversely affecting PCE-3. The rehabilitation (e.g., dismantle or alter) of human-made structures (e.g., agricultural dikes and berms, railroad grades, and ditches and diversions) for the purpose of restoring hydrological function, especially as it relates to recharge, should improve channel, floodplain, and riparian function in Huachuca water umbel critical habitat (PCE-1, PCE-2, and PCE-3). However, even subtle changes in the hydraulics resulting from the removal of instream structures can change local erosion and deposition dynamics. This can have both beneficial and adverse effects on Huachuca water umbel critical habitat by altering suitability of habitat patches. However, these dynamics should be within the normal range of PCE-2.

Bank extensions into the channel that have formed as a result of channel narrowing processes induced by herbaceous vegetation creeping into the channel or behind instream structures may be lost during structure removal, adversely affecting PCE-3. Loss of bank and bed stability and the risk of flood-induced erosion from project activity can adversely affect PCE-2 but can be rehabilitated following structure removal. In some cases, moderate levels of disturbance may have a beneficial effect on PCE-2 in that some areas may be more conducive to establishment of Huachuca water umbel if plants that compete with Huachuca water umbel are reduced or removed.

The improvement of roads and trails (to reduce erosion) affecting watershed health and function should improve watershed conditions thereby having beneficial effects on Huachuca water umbel critical habitat.

### **Water Management**

Water management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources and are therefore anticipated to have beneficial effects on Huachuca water umbel critical habitat.

Groundwater protection and conservation will directly positively affect critical habitat quality and long-term persistence (PCE-1, PCE-2, PCE-3, and PCE-4). Perfecting and defending water rights would protect water availability, which is foundational to maintaining the riparian-wetland ecosystem that supports Huachuca water umbel critical habitat (PCE-1).

Current water use associated with administrative, livestock, recreational, and private activities is 17.83 acre-feet per year and projected use is 17.17 acre-feet per year. Water conservation will be achieved by designing water supply systems for administrative use, livestock, and recreation to minimize groundwater pumping. For example, BLM will periodically assess existing potable water systems to determine if any systems should be decommissioned or modified. BLM will also switch livestock waters from the traditional earthen stock tanks to covered water storage tanks and troughs; this is anticipated to save 0.46 acre-feet per year (the projected consumption of water for livestock is anticipated to be 0.64 acre-feet per year (from 1.10 acre-feet current use). With the exception of the private use of BLM wells at Hereford (which currently use and are projected to use 15 acre-feet per year), all other projected uses combined equal 2.17 acre-feet with well locations distributed widely, leading to a low potential for effects to the Huachuca water umbel critical habitat. That said, the total projected water use may impact critical habitat that supports Huachuca water umbel. Excluding authorization of the use of groundwater from uses tied to realty actions, will protect Huachuca water umbel critical habitat from activities that could reduce groundwater volume or elevation.

Short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on Huachuca water umbel critical habitat (PCE-1), but could possibly result in longer term adverse effects. If conditions indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS to reduce potential adverse effects that may become apparent once details of the activity are known.

While the Water Management element of the RMP will largely be beneficial for Huachuca water umbel critical habitat, the private use of a BLM well near Hereford that draws 15 acre-feet of water annually would have an adverse effect on CH (PCE-1) through the potential to capture groundwater that provides surface flow. The 10- and 50-year estimated capture of the water by this well that would otherwise be available for riparian plants or surface flow for the Hereford reach of the San Pedro River is approximately 60 and 90%, respectively (USGS 2008).

#### **Vegetation Management specific to Sandy Washes (Xeric Riparian)**

No effects to Huachuca water umbel critical habitat are likely from management of xeric riparian habitat.

#### **Vegetation Management: All Upland Vegetation Communities, Including Chihuahuan Desert Scrub and Grasslands**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should benefit Huachuca water umbel critical habitat. Vegetation management in combination with watershed management actions are anticipated to contribute to the long-term persistence and improvement of Huachuca water umbel critical habitat over the life of the plan (PCE-1, PCE-2, PCE-3, and PCE-4). However, some vegetation management (which includes

vegetation treatments, erosion control projects, and other management tools to alter vegetation) may have short-term adverse impacts on critical habitat. For example, vegetation treatments may result in the removal of vegetation and soil exposure, which would temporarily move habitat away from PCEs related to a stable riparian plant community. However, over time vegetation treatments should enhance the PCEs of Huachuca water umbel critical habitat by removing nonnative plants and restoring native vegetation communities.

The total acreage to be treated under this RMP element is estimated at 27,460 acres (Prescribed fire 17,070 acres; Mechanical 6,130 acres; Herbicide 11,040 acres; the acreage of specific treatment types exceeds the total treatment area of 27,460 acres because some areas may be treated using multiple methods). Vegetation treatments will occur on 10 acres of Huachuca water umbel critical habitat, however, most of the vegetation treatments would occur in the uplands away from critical habitat, which could have an indirect, beneficial effect on riparian and wetland vegetation in critical habitat (PCE-3). For example, the use of biological (e.g., targeted livestock grazing, insects), mechanical, prescribed fire, and chemical management (i.e., Integrated Vegetation Management Plan) to suppress, control, and/or eliminate invasive species and noxious weeds has the potential to enhance Huachuca water umbel critical habitat (PCE-3). Similarly, the use native trees, shrubs, herbs, and seed mixes for restoration will help maintain the overall ecological integrity of treated sites following restoration of floodplain habitats adjacent to Huachuca water umbel critical habitat.

The USFWS and BLM consulted on the effects to Huachuca water umbel from prescribed fire through the consultation on the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (#02-21-03-F-0210). The proposed action under the RMP is to continue prescribed fire as detailed in the Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management Biological Opinion. Therefore, the effects of prescribed fire will not be addressed in this RMP consultation.

The use of herbicides has risks associated with indirect exposure through surface water in critical habitat. Chemicals used for the spot treatment of vegetation, when applied as directed, would be used in such small quantities that there would likely be little to no toxic effects on critical habitat. Details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required.

A variety of conservation measures will be used to reduce the risk of adverse effects on Huachuca water umbel from vegetation treatments. Some of the primary conservation measures include the following:

- Use spot treatment application of herbicide where practical;
- Create treatment buffers between the herbicide treatment area and Huachuca water umbel habitat; and

- Use GPS-guided delivery when using spray or pellets on days with little or no wind.

After a vegetation/restoration treatment, livestock would be excluded from the treatment area for two growing seasons or until resource objectives are met for the treatment site. This would allow upland sites to have healthy grass and shrub cover that can withstand grazing pressure and allow the treated portion of the watershed to maintain its hydrologic integrity, which has an effect on riparian groundwater recharge and riparian function (PCE-1, PCE-2, PCE-3, and PCE-4).

### **Vegetation Management Specific to Riparian Areas and Wetlands**

The effects of vegetation management specific to riparian areas and vegetation management specific to wetlands are combined because they are closely interrelated. Overall, riparian and wetland vegetation management, which generally aims to protect, maintain, restore, and improve riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to Huachuca water umbel critical habitat. Not disrupting key ecological processes, such as ecological site stability, erosion, deposition, or recharge potential, in sensitive riparian and wetland ecological sites and surrounding areas (e.g., floodplains adjacent uplands) would help ensure the ecological integrity (PCE-1, PCE-2, PCE-3, and PCE-4) of aquatic, riparian, and wetland habitats, including Huachuca water umbel critical habitat. However, implementation of some riparian and wetland vegetation management projects (e.g., vegetation and channel treatments) may result in localized, short-term adverse effects to Huachuca water umbel critical habitat (e.g., localized changes in the wetland and riparian vegetation type and densities).

Channel treatments would be used to improve geomorphology, which is the foundation for riparian processes, including overbank flooding (recharge, PCE-1), riparian vegetation establishment (PCE-2 and PCE-3), riparian plant species and age diversity (PCE-3), aquatic habitat diversity (PCE-2 and PCE-3), and wetland creation. Ultimately, the channel treatments coupled with vegetation treatments would have beneficial effects on CH (PCE-1, PCE-2, PCE-3, and PCE-4) by promoting the development of channel processes that are more dynamic and the development of vegetation communities with a greater diversity of vegetation types and age classes of trees, shrubs, grasses, and forbs. A channel in dynamic equilibrium would have areas of scour and deposition that would remove vegetation and allow for the establishment of new vegetation as channel meanders move down valley over time. Stream channel geomorphology would be enhanced by installing soft structures in streams, such as vegetation or posts, to increase meandering and sinuosity. This would initially adversely affect Huachuca water umbel critical habitat by the loss of existing patches suitable for HWU through scour as meanders form, which induces erosion on the outside of channel bends. However, to minimize the intensity and magnitude of adverse impacts, the projects would be carried out in phases and the effects would be monitored to reduce temporary impacts on Huachuca water umbel critical habitat.

Over time, channel enhancements would increase overbank flooding with shallow aquifer recharge, improve surface flow permanence, and increase tree generation along point bars; all these features would enhance PCEs of Huachuca water umbel critical habitat. In addition, increased potential for new ciénega development in areas where induced channel meanders are cut off would also support PCEs.

Vegetation treatments would occur on 10 acres of Huachuca water umbel critical habitat along the San Pedro River. It is anticipated that riparian vegetation treatments aimed at improving resilience to moderate floods and erosional degradation would maintain and or improve Huachuca water umbel critical habitat along the San Pedro River with beneficial effects primarily on PCE-2 and PCE-3 but also PCE-4.

The limited use of herbicide and mechanical vegetation treatments in riparian areas to restore riparian function may improve critical habitat conditions in the long-term. These treatments could also have short-term, localized impacts on Huachuca water umbel critical habitat. For example, the use of herbicides has risks associated with indirect exposure through surface water in Huachuca water umbel critical habitat. That said, chemicals used for the spot treatment of vegetation should be used in such small quantities that there would likely be little to no toxic effects on Huachuca water umbel critical habitat. Potential adverse effects would be lessened or eliminated through the incorporation of conservation measures in project plans. Important conservation measures for wetland and riparian vegetation projects in critical habitat may include the following:

- Use of spot treatments of individual plants;
- Use of herbicides that can be safely applied in aquatic areas;
- Use of minimum tools to reduce the project footprint and effects;
- Use of heavy equipment equipped for low-pressure contact with the earth;
- Use of methods and techniques that are designed to maintain site stability during restoration activities; and
- Institution of appropriate timing restrictions to periods when bank soils are dry and less susceptible to damage.

The use of livestock-proof fencing (steel tubing construction) around the perimeter of restored and constructed artificial wetland ponds would help maintain critical habitat integrity (e.g., bank sheering and clay soil compaction).

For example, by limiting foot trails to the upper banks and spur tails on lower banks to short segments along stream courses, bank stability would be maintained. Bank stability is fundamental to the function of existing riparian vegetation that supports Huachuca water umbel habitat on the SPRNCA. The maintenance of existing firebreaks (addressed in the Wildland Fire and Management Section) would additionally protect large tracts of riparian habitat from loss due to wildfire.

To protect riparian vegetation, new recreation developments would have to be designed to minimize effects on riparian vegetation from trampling and soil erosion; this would limit the potential for adverse effects on Huachuca water umbel critical habitat (PCE-3). For example, by limiting foot trails to the upper banks and spur tails on lower banks to short segments along stream courses, bank stability would be maintained (PCE-2). Bank stability is fundamental to the function of existing riparian vegetation (PCE-3) that support Huachuca water umbel critical habitat.

## **Fish, Wildlife, and Special Status Species**

### ***Species reintroductions and augmentations***

This RMP element, including, managing for priority species; supporting, maintaining, and restoring habitat and habitat connectivity; controlling aquatic invasive species; and implementing recovery plans is likely to have beneficial effects on the Huachuca water umbel critical habitat. However, some activities associated with implementation of this element, may adversely affect Huachuca water umbel critical habitat.

Reintroductions and augmentation of native riparian plant species would support the PCEs of Huachuca water umbel critical habitat (PCE-3). Similarly, habitat management and protections for the Huachuca water umbel and other species, such as controlling nonnative plants, could also support PCEs.

The effects of beaver establishment and augmentation on Huachuca water umbel critical habitat has been addressed through previous section 7 consultation (Biological Opinion #2-21-97-F-097, Reintroduction of Beaver into the San Pedro Riparian SPRNCA). Therefore, the effects will not be addressed in this biological opinion on the RMP.

Effects to Huachuca water umbel critical habitat from reintroductions of several listed species (Chiricahua leopard frog, Gila chub, Gila topminnow, desert pupfish, and Huachuca water umbel) and species of concern (lowland leopard frog [*Lithobates (Rana) yavapaiensis*], Sonoran mud turtle, and NMGS, which is now listed as threatened), were analyzed in consultation 22410-2008-F-0103, Biological Opinion on Aquatic Species Conservation at the San Pedro Riparian and Las Ciénegas National Conservation Areas, Arizona. Therefore, the effects will not be addressed in this biological opinion on the RMP.

### **Wildland Fire and Management**

The SPRNCA is a full suppression area (55,990 acres) for all natural and human-caused ignitions. The USFWS and BLM consulted on the effects of fire suppression through the Statewide Amendment for Fire, Fuels, and Air Quality Management (Biological Opinion #02-21-03-F-0210), and therefore, these effects will not be addressed in this RMP consultation.

The conservation area would continue to have an estimated 610 acres of firebreaks, of which 580 acres are on BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. The maintenance of existing firebreaks would protect large tracts of riparian habitat within Huachuca water umbel critical habitat from loss due to wildfire. Effects to Huachuca water umbel critical habitat were analyzed in detail in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion #02EAAZ00-2015-F-0431).

### **Cultural Resources**

No effects to Huachuca water umbel critical habitat from work related to the stabilization and rehabilitation of cultural sites are anticipated, as this species occurs along the margins of active stream channels well away from cultural features.

**Native American Concerns**

If entry into Huachuca water umbel critical habitat by BLM staff or Native Americans occurs while collecting plants by hand, very limited short-term effects (trampling of Huachuca water umbel habitat for minutes to a few hours) may occur.

**Visual Resources**

No effects to Huachuca water umbel critical habitat are anticipated from management of visual resources.

**Paleontological Resources**

No effects to Huachuca water umbel critical habitat are anticipated from management of paleontological resources.

**Livestock Grazing**

The USFWS and BLM consulted on the effects to Huachuca water umbel critical habitat from livestock grazing on the four SPRNCA allotments through the consultation on the Gila District Grazing Program (Biological Opinion #22410-2006-F-0414). The proposed action under the RMP is to continue grazing as detailed in the Gila District Grazing Program Biological Opinion. Therefore, the effects of livestock grazing will not be addressed in this RMP consultation.

**Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and education opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to result in short- and long-term adverse effects to the Huachuca water umbel critical habitat; however, the education component of recreation management may benefit critical habitat by providing information to the public about resource conservation.

Because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. To accommodate such recreational interest in the San Pedro, over the life of the RMP, access to the San Pedro River could be increased to 17 locations, including 1 on the Babocomari River. These locations have trails that are currently used, but 5 do not yet have trailhead development. While recreational activities may increase over time, recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, such as Escapule and Hereford, although some dispersed recreation will also continue to occur.

Adverse effects to critical habitat (PCE-2, PCE-3, and PCE-4) from recreational activities may include minor erosion and sedimentation into waterways; compaction of soil under certain conditions; and reduced vegetation, especially where trails are located on the toe of floodplains and river banks. Recreational use on the SPRNCA can cause trails from becoming erosion

features that could adversely affect Huachuca water umbel critical habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge (PCE-1, PCE-2, PCE-3, and PCE-4). Trails have become incised in the past due to human use; however, increased trail monitoring and maintenance could prevent adverse effects to Huachuca water umbel critical habitat from continued and possibly increased trail use.

Dispersed recreation (e.g., backcountry camping, hunting, wood gathering) in more remote areas may result in some adverse effects to Huachuca water umbel critical habitat. Backcountry camping may result in impacts to Huachuca water umbel critical habitat; however, because less than 50 backcountry permits are issued annually, typically for 1 to 3 days for 1 or 2 people (traveling either on foot or horse), we anticipate that adverse impacts will occur infrequently and be temporary. In the future, numbers of backcountry users may increase, potentially resulting in increased human activity in Huachuca water umbel critical habitat, possibly resulting in damage to vegetation and soils in critical habitat (PCE-2 and PCE-3). Campers can start wildfires leading to damage to Huachuca water umbel critical habitat. However to protect riparian vegetation and species from potential wildfire starts, designated campfire locations with fire rings are placed well away from this vegetation type.

Mowing, primarily for the trailhead areas and for trail segments that are prone to vigorous grass and forb growth, is not anticipated to occur near stream banks and aquatic habitat; therefore, no adverse effects on Huachuca water umbel critical habitat are anticipated.

The area of riparian habitat that may be affected (e.g., through bank trampling and capture of flood flows by trails that can change the aquatic habitat character) by recreational activities on road and trails currently occurring or proposed in the RMP is estimated at 605 acres of Fremont cottonwood-Goodding's willow vegetation type, of which only a fraction has surface water or moist conditions (PCE-1).

As part of travel management, about 202 miles on the SPRNCA route (trails and roads) inventory would be evaluated. Currently, there are 4 miles (1.2 acres) of planned trails; however, the actual number and location of trails in critical habitat could change based on implementation-level travel management planning. If new travel routes in potential habitat are designated (as part of travel management), then impacts to critical habitat may occur. Conversely, the decommissioning of travel routes will likely be beneficial for Huachuca water umbel critical habitat. Development of non-motorized trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in critical habitat, resulting in some level of additional adverse impacts similar to those discussed elsewhere in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA has not been determined.

### **Lands and Realty**

Overall, this RMP element which includes managing lands to conserve their aquatic and riparian values, will likely benefit the Huachuca water umbel critical habitat. For example, closing SPRNCA to commercial energy development should be beneficial critical habitat, as it would exclude activities associated with such development that may adversely affects PCEs. Land



acquisition may benefit the conservation of Huachuca water umbel critical habitat depending on the location of parcels acquired.

Some actions associated with Lands and Realty may adversely affect Huachuca water umbel critical habitat. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. The renewal and possible changes to these ROWs could degrade Huachuca water umbel critical habitat (PCE-2 and PCE-3).

Maintenance activity near the El Paso Gas Line and Tombstone Aqueduct also has the potential to cause adverse effects to Huachuca water umbel critical habitat by damaging vegetation and destabilizing river beds and banks, which may predispose it to erosion (loss) (PCE-2 and PCE-3). The Charleston Road ROW utility corridor runs through a perennial portion of the San Pedro River within Huachuca water umbel critical habitat and the El Paso Gas Line and Tombstone Aqueduct cross riparian habitat, so possible changes made to their configuration could affect water umbel in the future as the occurrence expands from transplanting the species to new areas. Potential impacts to Huachuca water umbel critical habitat from renewing existing ROWs could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. It is uncertain at this time what the stipulations are and if they will be implemented, however. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in impacts to Huachuca water umbel critical habitat. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects to Huachuca water umbel critical habitat from such activities will likely be minimal or avoided altogether.

Recreation associated with railroad beds and bridges, which run next to and cross the San Pedro and Babocomari Rivers, could result in disturbance to Huachuca water umbel critical habitat should the Surface Transportation Board (STB) allow them to be declared as abandoned or provide a ROW for adding them to the San Pedro Trail System and future Babocomari trail system. The probability of railroad beds coming under BLM administration or attainment of a ROW is unknown; however, any potential effects on federally listed species or critical would require section 7 consultation.

### **Wild and Scenic Rivers**

Most Wild and Scenic Rivers management actions are not anticipated to affect Huachuca water umbel critical habitat. However, remediation of hazardous material from abandoned mines would have a beneficial effect on critical habitat through the reduction of direct exposure to contaminants, including copper, washed into critical habitat.

### **CUMULATIVE EFFECTS— HUACHUCA WATER UMBEL (*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect Huachuca water umbel and its critical habitat are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction and maintenance, groundwater extraction, surface water diversion, farming, livestock grazing, mining, off-highway vehicle use, recreation, introduction and proliferation of nonnative invasive species, water contamination, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in direct mortality of Huachuca water umbel and loss and modification of its habitat.

For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss of habitat, increased water use, and would change watershed runoff characteristics in the form of increased runoff rates causing increases in peak flows that can cause accelerated erosion (incision) in ephemeral drainages, streams and the San Pedro River they feed. This could adversely affect Huachuca water umbel and its critical habitat.

During the 2010 Census, Arizona grew more than 20 percent between 2000 and 2010, and it is predicted that Arizona would be the second fastest growing state in the country through 2030. If these predictions are true, already severe threats to groundwater that supplies riparian and aquatic habitat (that Huachuca water umbel requires) would worsen, primarily due to increased human demand for surface and groundwater. Thus, probably the most significant cumulative effect on Huachuca water umbel and its critical habitat includes continued local and regional groundwater depletion because it is minimally regulated by the State of Arizona. Groundwater is used faster than the aquifer can recharge in many developed areas of Arizona including the upper San Pedro basin.

Surface water is diverted at the St. David Diversion near St. David, Arizona. This diversion, which is expected to continue into the future, affects the availability of surface water in the San Pedro River in the spring and early summer on an annual basis. This has an adverse effect on

aquatic habitat availability to Huachuca water umbel in the SPRNCA. Hunting and trapping activities regulated by the state may result in the removal of beaver from the river. The loss of beaver would have an adverse impact on aquatic species as resilience to long-term drought and increasing temperatures (climate change) through a reduction in recharge reducing wetland water levels and stream flows.

Livestock grazing on non-federal lands is expected to continue in the action area which may adversely affect watershed function including alteration and subsequent changes in the natural flow regime, sediment production, stream channel morphology, runoff rates, and recharge, thereby affecting Huachuca water umbel habitat. Trespass livestock (from non-federal areas) along the San Pedro River and St. David Ciénega are likely to continue to result in some effects to Huachuca water umbel through the risk of localized trampling and discrete areas of habitat damage.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur and are anticipated to continue to occur in the action area. These activities can also degrade Huachuca water umbel habitat. Other unregulated non-federal activities that can directly or indirectly affect Huachuca water umbel and its habitat are expected to continue to occur in the action area (e.g., inappropriate use of OHVs, increased or improper use of herbicide).

In addition to adverse cumulative effects, some beneficial effects are likely from various activities in the action area in the future as well. For example, beneficial cumulative effects on Huachuca water umbel may occur where private and other landowners are returning their property to native upland plant communities. Improved vegetation cover generally improves watershed function and hydrologic cycle favoring groundwater recharge. The Hereford Natural Resource Conservation District has promoted watershed restoration and vegetation conversion to semidesert grassland, as has Fort Huachuca. Implementation of recharge projects by the Cochise Conservation and Recharge Network projects (13,510 acres) and wastewater effluent recharge project associated with the Sierra Vista Environmental Operations Park are likely to continue to provide a source of groundwater to offset groundwater extraction used for municipal and rural uses. This is likely to continue to benefit Huachuca water umbel.

The potential effects of long-term drought and hotter average temperatures are likely to result in the future loss or reduction of semidesert grassland, aquatic, wetland, and riparian habitats. The loss of riparian and wetland habitat is likely to be compounded by continued depletion of groundwater in the basin by a variety of uses unless the current trend is reversed. Hotter, drier conditions are likely to also result in a higher risk of fires in riparian areas or surrounding mountains, which are areas critical to aquifer recharge. With the improvement of watershed, stream channel conditions, beaver activity, and recharge projects on the SPRNCA, it is anticipated that the resiliency of the ecosystem to these atmospheric conditions may be improved to the point where surface water, wetlands, and large areas of riparian habitat are protected from loss or large-scale reduction that otherwise would occur. This would have a beneficial effect on Huachuca water umbel and its critical habitat.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS — HUACHUCA WATER UMBEL (*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion — Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*)**

After reviewing the current status of the Huachuca water umbel and its critical habitat, the environmental baseline for the action area, the effects of the proposed SPRNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Huachuca water umbel, and is not likely to destroy or adversely modify designated critical habitat for this species. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;
- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and
- Any future-project specific activities under the SPRNCA RMP that may affect the Huachuca water umbel and its critical habitat will receive additional Service review

and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this biological opinion are based on full implementation of the project as presented in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

**INCIDENTAL TAKE STATEMENT- HUACHUCA WATER UMBEL  
(*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

**CONSERVATION RECOMMENDATIONS — HUACHUCA WATER UMBEL  
(*LILAEOPSIS SCHAFFNERIANA* SSP. *RECURVA*)**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

1. Continue monitoring Huachuca water umbel on the SPRNCA.
2. Participate in recovery efforts and implement recovery actions detailed in the 2017 Recovery Plan, such as attaining water rights and augmenting or introducing occurrences of the Huachuca water umbel.

3. Participate in genetic studies to determine population and meta-population dynamics of Huachuca water umbel throughout its range.
4. Continue to collect and analyze monitoring data regarding Huachuca water umbel occurrences on the SPRNCA to assess trends.
5. Use locally sourced native plant species for restoration efforts.
6. Conduct annual monitoring of grazing activities to assess needed changes.
7. Continue with its ongoing efforts to arrest erosion and restore ecosystems on streams on the SRPNCA within which Huachuca water umbel occurs.
8. Control non-native species impacting habitat quality for Huachuca water umbel.
9. In cases where habitat restoration or other RMP activities could destroy Huachuca water umbel occurrences, salvage plants before they are destroyed and replace them after restoration is complete.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

## **STATUS OF THE SPECIES - DESERT PUPFISH**

### **Description and Legal Status**

The desert pupfish is a small fish, less than three inches long, and a member of the Cyprinodontidae family (Minckley 1973). The body is thickened and laterally compressed; coloration is a silvery background with narrow dark vertical bars on the sides. The protruding mouth is equipped with tricuspid teeth and the desert pupfish has an opportunistic, omnivorous diet, consisting of invertebrates, plants, algae, and detritus (Cox 1966 and 1972, Naiman 1979). Males are larger than females and become bright blue with orange-tipped fins during the breeding season and exhibit aggressive, territorial behavior (USFWS 1993).

The desert pupfish (*Cyprinodon macularius*) was listed as an endangered species with critical habitat on March 31, 1986 (USFWS 1986, 51 FR 10842). The Mexican government has also listed the desert pupfish as endangered. The reasons for decline of this fish include competition from exotic fishes, water pollution, ground-water pumping, agricultural pesticide drift, stream channelization and habitat modifications. A recovery plan was completed in 1993 (USFWS 1993).

### **Life History and Habitat**

Spawning occurs from spring through autumn, but reproduction may occur year-round depending on conditions (Constanz 1981). The desert pupfish appears to go through cycles of expansion and contraction in response to natural weather patterns (USFWS 1986, 1993, Weedman and Young 1997). In very wet years, populations can rapidly expand into new habitats (Hendrickson and Varela-Romero 1989). Historically, this scenario would have led to panmixia among populations over a very large geographic area (USFWS 1993).

The desert pupfish has a tolerance for high temperatures, high salinities, and low dissolved oxygen concentrations that exceed the levels known for many other freshwater fishes (Lowe et al. 1967, USFWS 1993). Habitats have included clear, shallow waters with soft substrates associated with cienegas, springs, streams, margins of larger lakes and rivers, shoreline pools,

and irrigation drains and ditches below 5,200 feet in elevation (Minckley 1973, Hendrickson and Varela-Romero 1989). Historical collections occurred in Baja California and Sonora, Mexico, and in the U.S. in California and Arizona.

### **Distribution, Abundance, Population Trends**

Historical collections of desert pupfish occurred in Baja California and Sonora, Mexico, and in the U.S. in California and Arizona. Historical distribution of desert pupfish in Arizona included the Gila, San Pedro, Salt, and Santa Cruz rivers, and likely the Hassayampa, Verde, and Agua Fria rivers, although collections are lacking for the latter three. The desert pupfish was also found in the Lower Colorado River, Rio Sonoyta basin, Salton Sink basin, and Laguna Salada basin (Eigenmann and Eigenmann 1888, Garman 1895, Gilbert and Scofield 1898, Evermann 1916, Miller 1943, Minckley 1980, Black 1980, Turner 1983, Miller and Fuiman 1987). Additional life history information can be found in the recovery plan (USFWS 1993) and five-year review (USFWS 2010 and other references cited there).

In Arizona, the desert pupfish genus *Cyprinodon* was historically comprised of two recognized subspecies, (*C. m. macularius*) and (*C. m. eremus*), and an undescribed taxon, the Monkey Spring pupfish (USFWS 2010). However, desert pupfish subspecies are now recognized as the following separate species, as supported by Echelle et al. (2007) and Koike et al. (2008): 1) the desert pupfish (*C. macularius*); 2) the Rio Sonoyta (Quitobaquito) pupfish (*C. eremus*) (Echelle et al. 2000), and 3) the undescribed Monkey Spring form has since been described and renamed the Santa Cruz pupfish (*C. arcuatus*) (Minckley et al. 2002). Under the ESA, both desert pupfish and Rio Sonoyta pupfish are still listed as subspecies of *C. macularius*, although updates to this listing are proposed.

Because only desert pupfish occur on the SPRNCA, the rest of this status will focus on this species (*C. macularius* or *C. m. macularius*). Naturally occurring populations of desert pupfish (*C. m. macularius* or *C. macularius*) are now restricted in the U.S. to two streams tributaries, in shoreline pools and irrigation drains of the Salton Sea, and in the Sea itself in California (Lau and Boehm 1991, Keeney 2013). This species is found in Mexico at scattered localities along the Colorado River Delta and in the Laguna Salada basin (Hendrickson and Varela-Romero 1989, Minckley 2000).

Although many reestablishments have been attempted, approximately 25 transplanted populations of the desert pupfish exist in the wild at present, although this number fluctuates due to the establishment (and failure) of populations (Moyle 2002) (Tier 2 populations in the Recovery Plan) (USFWS 1993, Voeltz and Bettaso 2003, USFWS files). There are 47 captive or refuge desert pupfish populations (that do not qualify as Tier 3), comprised of 34 in Arizona, 8 in California, and 5 in Sonora, Mexico. The range-wide status of desert pupfish is poor but stable, although increasing in Arizona due to an active recovery program (Duncan and Clarkson 2013, Crowder and Robinson 2015, Robinson and Crowder 2015). The fate of the species depends heavily upon future developments in water management of the Salton Sea and Santa de Clara Cienega in Mexico.

### *Arizona*

No natural populations of *C. m. macularius* remain in Arizona, although numerous captive and wild, reestablished populations currently exist (AGFD and USFWS, unpublished data). These populations have been established on private, municipal, county, state, and Federal lands. Desert pupfish have also been successfully established at several wild sites at the San Pedro Riparian National Conservation Area. Additional captive sites persist in southern Arizona, with a number of refuge and wild ponds having recently been created under a Safe Harbor Agreement (AGFD 2015).

## **Threats**

Many natural and reestablished desert pupfish populations are imperiled by one or more threats. Threats to the species relating to destruction or curtailment of habitat include loss and degradation of suitable habitat through ground water pumping or water diversion; contamination from agricultural return flows, as well as other contaminants, and physical changes to water properties involving suitable water quality (71 FR 20714, USFWS 1986, 2010; Moyle 2002, Martin and Saiki 2005, Echelle et al. 2007, Minckley and Marsh 2009). On Federal lands, Endangered Species Act section 7 consultations have addressed effects of grazing, roads and bridges, agency planning, fire, flooding, recreation, pest control programs, irrigation drain maintenance, water transfers, and water development as potential threats to desert pupfish habitat. Although effects from these threats continue to be moderated for the desert pupfish, biologically, impacts from these threats individually and collectively can create fragmented populations in poorer quality habitat that are small and restricted in range, which can further endanger the desert pupfish.

The threats identified at the time of listing and in the recovery plan continue unabated. New non-native aquatic species continue to establish within the desert pupfish's range, and previously existing non-native species increase in numbers and distribution (Minckley and Marsh 2009). Human demands for water are unending, with the Salton Sea and Cienega de Santa Clara suffering water level declines and the associated threats to the desert pupfish from water depletion, such as habitat loss, fragmentation, and degradation of habitat quality still ongoing. Water availability for the desert pupfish will continue to suffer with predicted trends for warmer, drier, and more extreme hydrological conditions associated with climate change.

### *Habitat loss and modification*

Groundwater extraction was considered a threat in the listing (51 FR 10842), recovery plan (USFWS 1993), and in the five-year review (USFWS 2010). Water extraction removes and degrades habitat, leaving higher concentrations of salts, toxic contaminants, and sediment in the remaining volumes of water and lower amounts of dissolved oxygen, and thus interacts with other compounding threats. Water reductions could lead to less shallow-water habitat preferred by the desert pupfish. Slight increases in salinity could benefit desert pupfish, by reducing populations of problematic nonnative fishes. However, if salinity keeps increasing, wetland areas may become unsuitable even for pupfish. The proposed changes to the configuration of the Salton Sea will reduce pupfish habitat, but there will still be habitat for numerous populations to persist. Any change to the water budget at Cienega de Santa Clara could be detrimental to the desert pupfish there.



Since the 19th century, desert pupfish habitat has been impacted by streambank erosion, the construction of water impoundments that dewatered downstream habitat, excessive groundwater pumping, the application of pesticides to nearby agricultural areas, and the introduction of nonnative aquatic species as both predators and potential competitors (Matsui 1981, Hendrickson and Minckley 1984, Minckley 1985, Schoenherr 1988). The bullfrog is an opportunistic omnivore with a diet that includes fish (Frost 1935, Cohen and Howard 1958, Brooks 1964, McCoy 1967, Clarkson and deVos 1986). Introduced salt cedar (*Tamarisk* spp.) growing adjacent to desert pupfish habitat might cause a lack of water at critical times (Bolster 1990, R. Bransfield, USFWS, pers. comm. 1999); however, recent scientific information contradicts the long held belief that tamarisk consumes more water than native trees (Glenn and Nagler 2005).

### *Recreation and Grazing*

Watershed condition has been and continues to be a concern over most of the Southwest. Recreational pursuits that have the potential to increase soil erosion (i.e. off-road vehicles are a concern for desert pupfish because of their impacts to watershed health, rather than any direct effects. Overgrazing and historically extensive logging combined with climatic events (drought followed by rain events), have led to increased erosion and deeper channelization (Miller 1961, Bahre 1991), which do not provide the more shallow, clear, and vegetatively complex wetlands preferred by the desert pupfish (Hanes 1996). Extensive logging is no longer a threat to desert pupfish or their habitats. Improper grazing at a watershed level probably does not impact desert pupfish populations anymore. Grazing of occupied sites still occurs in Mexico and the U.S. However, grazing in the U.S. is better managed and much less of a concern for its impacts to desert pupfish habitat. Urbanization and other human activities can and continue to impact watershed health and functioning.

Livestock grazing was not mentioned as a threat in the final rule (51 FR 10842), although habitat modification from grazing was mentioned in the recovery plan (USFWS 1993). The small size and high physical tolerance of the desert pupfish allow it to exist in small amounts of water spanning a wide variety of extreme habitat and water quality conditions (USFWS 1993). Due to the scarcity of water in the desert pupfish's desert habitat and the tendency for cattle to congregate in watered areas, cattle are attracted to desert pupfish habitats that can lead to local impacts quickly. Low water conditions combined with congregations of cattle activity (grazing, watering, hoof action) can lead to additional reductions in water, physiological effects of reduced water quality, bank trampling, fragmentation of contiguous water, isolation/stranding and trampling of fish and eggs (Roberts and White 1992), and loss of habitat through de-watering. Long-term or seasonal drought can also exacerbate these conditions. Round-up of trespass cattle within these small enclosed areas could cause cattle congregations to increase their hoof action and cause movement into fish habitat. Cattle can cause disturbance, a decline in water quality, and mortality of fish and desert pupfish eggs, particularly at the perimeter of ponds, springs, wells, and shallow wetland areas, by reducing the distribution and abundance of water and isolating fish and eggs into inhospitable areas (Kauffman and Krueger 1984, Fleischner 1994, Belsky et al. 1999). Carefully controlled grazing around some of the small pond habitats as a tool to manage problematic aquatic vegetation could actually be beneficial to the desert pupfish (Kodric-Brown and Brown 2008). Although impacts from livestock grazing have been problematic in some areas, as a result of consultations many of the impacts have been alleviated through fencing and grazing rotations.

Environmental contaminants and elevated salinity have been identified as threats to desert pupfish in the Salton Sea.

#### *Predation and Competition*

Desert pupfish are susceptible to parasites and predation and competition from non-native fish and other species. Predation and competition from non-native fish have been identified as main causes of the decline of the species (51 FR 10842; USFWS 1993, 2010). Non-native fish are still a major threat to the desert pupfish at this time. Martin and Saiki (2005) found the abundance of *C. m. macularius* to be inversely related to the abundance of non-native fish. Because non-native aquatic species are present in many occupied or potential desert pupfish habitats and non-native aquatic species are exceedingly difficult to get rid of once established, non-native aquatic species continue to be a major threat to the conservation of the desert pupfish. These threats still occur today and continue to be impacted by increasing human development and demand for water, as well as interactions with predicted trends for warmer, drier, and more extreme hydrological conditions associated with climate change.

#### *Climate Change*

Climate models predict not only temperature increases but also an increase in the frequency and severity of storm events, heat waves, and precipitation events. Temporal asynchronicity will exacerbate the impacts on aquatic habitats and organisms. Ultimately, climate change predicts regionally drier conditions for the Southwest and an increasing probability of drought. Assuming those predictions hold, we anticipate that fish species in the southwest will face the following conditions as a result of climate change:

- Increased water temperature;
- Decreased stream flow;
- A change in the hydrograph; and
- An increased occurrence of extreme events (such as fire, drought, and floods)

Temperature is a key factor defining the gradients of performance and the absolute bounds of life for most aquatic organisms. It also affects rates of growth and timing of key life history events or transitions (Rieman and Isaak 2010). Increased air temperature is likely to lead to increased water temperature, streams will become increasingly intermittent, and aquatic habitat will degrade. That being said, desert pupfish can survive and thrive at temperature well above those for other native species (Carveth et al. 2006) and therefore may be able to tolerate increases in water temperature.

#### **Conservation, Consultation and Recovery Planning**

The 1993 recovery plan for desert pupfish includes downlisting criteria, but no delisting criteria for the subspecies. Insoluble threats and limited habitat are stated as preventing delisting for desert pupfish in the foreseeable future. As explained in the section above, many efforts have been made to reestablish populations of desert pupfish into the wild and to protect them in refuge ponds, including in Arizona. Efforts to monitor desert pupfish are also implemented.

## **ENVIRONMENTAL BASELINE - DESERT PUPFISH**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of this analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above. The proposed action falls within the range of the desert pupfish.

### **Status of the species and critical habitat within the action area**

The desert pupfish historically occurred on the Upper San Pedro River but was extirpated due to such factors as habitat degradation and competition with and predation by exotic aquatic species (Minckley 1987, as cited in BLM 2019). Pupfish have since been reintroduced and established into Little Joe Wetland and Murray Springs. Attempts to reintroduce pupfish into Horse Thief Draw have been unsuccessful, but populations at Murray Springs and Little Joe Wetland persist (BLM files 2018, as cited in BLM 2019).

#### *Summary of the Status of the Species in the Action Area*

While conservation efforts have been made for this species in the action area, we think the aggregate effects of 1) aquatic habitat degradation, including unsustainable groundwater withdrawal; 2) the effects of drought and climate change; 3) wildfire and resulting sedimentation and scouring; and 4) poorly managed livestock grazing have contributed to the poor status of the species in the action area.

## **STATUS OF THE SPECIES – GILA TOPMINNOW**

### **Description and Legal Status**

Gila topminnow (*Poeciliopsis occidentalis occidentalis*) was listed as endangered in 1967 without critical habitat (USFWS 1967, 32 FR 4001). Only Gila topminnow populations in the U.S., and not in Mexico, are listed under the ESA. The reasons for decline of this fish include past dewatering of rivers, springs and marshlands, impoundment, channelization, diversion, regulation of flow, land management practices that promote erosion and arroyo formation, and the introduction of predacious and competing non-native fishes (Miller 1961, Minckley 1985). Other listed fish suffer from the same impacts (Moyle and Williams 1990). Life history

information can be found in the 1984 recovery plan (USFWS 1984), the draft revised Gila topminnow recovery plan (Weedman 1999), and references cited in the plans.

### **Distribution, Abundance, Population Trends**

Historically, the Gila topminnow was abundant in the Gila River drainage in Arizona and was one of the most common fishes of the Gila River basin, particularly in the Santa Cruz system (Hubbs and Miller 1941). Gila topminnow were also recorded from the Gila River basin in New Mexico (Minckley and Marsh 2009). In the last 50 years, this was reduced to only 16 naturally occurring populations. Presently, only 9 of the 16 known natural Gila topminnow populations are considered extant (Weedman and Young 1997, Voeltz and Bettaso 2003, USFWS files). Only eight have no non-native fish present and can be considered secure from non-native fish threats. There have been at least 200 wild sites stocked with Gila topminnow, however, topminnow persist at only 33 of these localities. Of these, two sites are outside topminnow historical range and one contains non-native fish (Voeltz and Bettaso 2003). All of these sites except two are in Arizona. Many of the reestablished sites are very small and may not contain viable populations, as defined in the draft revised recovery plan (Weedman 1999). In addition several of the 33 sites have been reestablished in the last few years, and their eventual disposition is unknown.

The status of the species is mixed. A recovery program actively stocks Gila topminnow in Arizona and New Mexico, reestablishing topminnow in “new” sites (Robinson 2011, 2012, 2013). However, the number of natural sites and natural topminnow populations at natural sites continue to slowly decline. Gila topminnow has gone from being one of the most common fishes of the Gila basin to one that exists at about 42 localities (9 natural and 33 stocked). Many of these localities are small and highly susceptible to perturbation.

### **Threats**

Gila topminnow are highly vulnerable to adverse effects from non-native aquatic species (Johnson and Hubbs 1989). Predation and competition from non-native fishes have been a major factor in their decline and continue to be a major threat to the remaining populations (Meffe et al. 1983, Meffe 1985, Brooks 1986, Marsh and Minckley 1990, Stefferud and Stefferud 1994, Weedman and Young 1997, Minckley and Marsh 2009). The native fish fauna of the Gila basin and of the Colorado basin overall, was naturally depauperate and contained few fish that were predatory on or competitive with Gila topminnow (Carlson and Muth 1989). In the riverine backwater and side-channel habitats that formed the bulk of Gila topminnow natural habitat, predation and competition from other fishes was essentially absent. As a result Gila topminnow did not evolve adaptive behaviors against predation or competition and is predator- and competitor-naive. Both large (Bestgen and Propst 1989) and small (Meffe et al. 1983) non-native fish cause problems for Gila topminnow as can non-native crayfish (Fernandez and Rosen 1996) and bullfrogs.

### *Climate Change*

Climate models predict not only temperature increases but also an increase in the frequency and severity of storm events, heat waves, and precipitation events. Temporal asynchronicity will exacerbate the impacts on aquatic habitats and organisms. Ultimately, climate change predicts regionally drier conditions for the Southwest and an increasing probability of drought.

Assuming those predictions hold, we anticipate that fish species in the southwest will face the following conditions as a result of climate change:

- Increased water temperature;
- Decreased stream flow;
- A change in the hydrograph; and
- An increased occurrence of extreme events (such as fire, drought, and floods)

Temperature is a key factor defining the gradients of performance and the absolute bounds of life for most aquatic organisms. It also affects rates of growth and timing of key life history events or transitions (Rieman and Isaak 2010). Increased temperature is likely to lead to increased water temperature, streams will become increasingly intermittent, and aquatic habitat will degrade.

### **Conservation, Consultation and Recovery Planning**

Our information indicates that, rangewide, over 100 formal consultations have been completed for actions affecting Gila topminnow. These opinions primarily include the effects of grazing, water developments, fire, species control efforts, recreation, land management planning, native fish restoration efforts, and mining.

## **ENVIRONMENTAL BASELINE – GILA TOPMINNOW**

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Description of the Action Area**

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purposes of this analysis, we use the BLM's definition of the action area as the U.S. portion of the Upper San Pedro Watershed (Figure 1), which includes the SPRNCA. The U.S. portion of the Upper San Pedro Watershed is located in southern Arizona and is described in the "Action Area" section above. The proposed action falls within the range of the Gila topminnow.

### **Status of the species and critical habitat within the action area**

The Gila topminnow historically occurred on the Upper San Pedro River, but it was extirpated due to such factors as habitat loss or alteration and the introduction of aquatic predators. The species, along with desert pupfish, has since been reintroduced into Murray Springs, Horsethief Draw, and Ben Spring; however, only populations at Murray Springs have become established (BLM 2019).

While conservation efforts have been made for this species in the action area, we think the aggregate effects of 1) aquatic habitat degradation, including unsustainable groundwater withdrawal; 2) the effects of drought and climate change; 3) wildfire and resulting sedimentation and scouring; and 4) poorly managed livestock grazing have contributed to the poor status of the species in the action area.

## **EFFECTS OF THE ACTION - DESERT PUPFISH AND GILA TOPMINNOW**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The effects for the desert pupfish and Gila topminnow are considered together because they are similar. We anticipate that the proposed action, the SPNRCA RMP, will result in net beneficial effects on desert pupfish and Gila topminnow by maintaining and managing for open space; restoring and maintaining wetland habitat and stream channel function for the species; and establishing new populations of these species, thereby significantly contributing to their recovery. Desert pupfish and Gila topminnow are associated with aquatic (open water) habitat on the SPRNCA and impacts to these habitats may result in direct and indirect effects on the species. Adverse impacts to these fish from implementation of the RMP include injury, mortality, reduced reproductive success, disturbance that may cause habitat avoidance or other changes in behavior, increased competition, and habitat modification (e.g., changes in habitat structure, erosion or sedimentation, hydrologic condition alterations, and reduced water quality) and loss.

Because this is a programmatic level consultation, it is not possible to assess the potential effects (adverse and beneficial) of the action on desert pupfish and Gila topminnow in detail (e.g., spatial extent, location, timing, frequency, duration); however, this will be done during future implementation level section 7 consultations. Furthermore, potential adverse effects associated the RMP may be minimized through implementing conservation measures. Because these measures will be developed through project level section 7 consultation, the level to which adverse effects may be avoided or minimized is difficult to estimate at the RMP level.

### **Air Quality**

No effects on desert pupfish and Gila topminnow are likely from management of air quality.

### **Soils and Watershed Management**

All of the soils and watershed management goals and objectives are related to maintaining, restoring, or improving watershed integrity function; they are anticipated to contribute to the long-term persistence and improvement of desert pupfish and Gila topminnow habitat located in riparian areas or wetlands on the SPRNCA that are occupied or being considered for population

establishment. The types of projects associated with the soils and watershed program are typically those that improve the function and physical condition of the vegetation and the soil in both upland habitat types and in riparian habitats. These projects, in conjunction with management actions related to vegetation management, are expected to improve the condition of wetlands, riparian areas and associated aquatic habitat that desert pupfish and Gila topminnow can use.

Management actions to control sheet, rill, and gully erosion on an estimated 5,040 acres are likely to improve watershed health in ways that improve the function of the hydrologic cycle, affecting recharge of groundwater and moderation of flood peaks. Recharge is improved further by implementing recharge enhancement projects on an estimated 2,170 acres of ephemeral tributaries. While desert pupfish and Gila topminnow do not occur on these ephemeral tributaries, water recharge in the watershed will generally have a beneficial effect on desert pupfish and Gila topminnow habitat in tributaries to the San Pedro River by raising the water table. Watershed projects are not anticipated to be implemented in habitat supporting desert pupfish and Gila topminnow, therefore should not directly adversely affect the species.

The area with human-made structures slated for removal in the San Pedro channel or floodplain is about 50 acres, based on an inventory of existing locations and the stream channel condition. These structures are not located in areas with desert pupfish or Gila topminnow and therefore their removal will have no direct or indirect adverse effect on these species. However, the rehabilitation (e.g., dismantle or alter) of human-made structures (e.g., agricultural dikes and berms, railroad grades, and ditches and diversions) for the purpose of restoring hydrological function, especially as it relates to recharge, should indirectly improve channel, floodplain, and riparian function in habitat with potential for future reintroductions of desert pupfish and Gila topminnow in the river.

While the net effect of Soils and Watershed Management on desert pupfish and Gila topminnow habitat is anticipated to be beneficial, some watershed treatments (e.g., modification of roads and trails, vegetation treatments, stream channel restoration treatments) may result in adverse effects to desert pupfish and Gila topminnow in areas where they occur such as Curry Draw (Murray Springs). Adverse effects may include loss of vegetation on banks and temporary loss of streambed habitat, depending on local conditions. Vegetation loss and the risk of flood-induced erosion from project activity can be remediated through reclamation of the site largely through revegetation. Other stabilizing treatments also can be implemented if necessary.

### **Water Management**

Water management goals and objectives in the RMP are designed to protect available water sources and conserve water for the benefit of aquatic, wetland, and riparian resources. Related management actions should benefit desert pupfish and Gila topminnow and habitat through groundwater protection and conservation, which directly affect habitat quality and long-term persistence. Perfecting and defending water rights should protect water availability, which is foundational to maintaining the aquatic-riparian and aquatic-wetland ecosystems that support both species.

Current water use associated with administrative, livestock, recreational, and private activities is 17.83 acre-feet per year and projected use is 17.17 acre-feet per year. Water conservation will be achieved by designing water supply systems for administrative use, livestock, and recreation to minimize groundwater pumping. For example, BLM will periodically assess existing potable water systems to determine if any systems should be decommissioned or modified. BLM will also switch livestock waters from the traditional earthen stock tanks to covered water storage tanks and troughs; this is anticipated to save 0.46 acre-feet per year (the projected consumption of water for livestock is anticipated to be 0.64 acre-feet per year (from 1.10 acre-feet current use). With the exception of the private use of BLM wells at Hereford (which currently use and are projected to use 15 acre-feet per year), all other projected uses combined equal 2.17 acre-feet with well locations distributed widely, leading to a low potential for effects to the desert pupfish and Gila topminnow habitat. That said, the total projected water use may impact aquatic habitats that support both fish. Excluding authorization of the use of groundwater from uses tied to realty actions, will protect desert pupfish and Gila topminnow from activities that could reduce groundwater volume or elevation.

Short-term (less than 30 days) use of groundwater for the emergency augmentation of surface flow for aquatic plants, fish, and wildlife is likely to have a short-term beneficial effect on desert pupfish and Gila topminnow habitat. As conditions indicate that such an emergency is likely to occur, the BLM would begin discussions (emergency consultation) with the USFWS in to reduce potential adverse effects that may become apparent once details of the activity are known.

#### **Vegetation Management: All Vegetation Communities**

Overall, vegetation management, which aims to maintain, restore, and improve vegetation communities, should benefit desert pupfish and Gila topminnow habitat. Desert pupfish and Gila topminnow habitat in rivers, streams, and wetlands depends on the overall health and function of the larger ecosystem that supplies water, sediment, and nutrients to these areas. While most of the vegetation treatments (including biological controls [e.g., targeted livestock grazing, insects], herbicide, prescribed fire, and mechanical treatments) will occur in the uplands away from desert pupfish and Gila topminnow habitat, they are anticipated to have long-term, indirect beneficial effects on habitat that supports or could support these species.

Nonetheless, vegetation management may result in some short-term adverse effects on desert pupfish and Gila topminnow habitat, such as increased sediment and increased peak flows. Some treatments near riparian or wetland habitat (e.g., floodplain grasslands) could possibly result in damage to desert pupfish and Gila topminnow habitat from activities such as prescribed fire. Conservation measures, if implemented, could help to minimize adverse effects to these species from vegetation management.

#### **Vegetation Management Specific to Riparian Areas and Wetlands**

Overall, riparian and wetland vegetation management, which generally aims to protect, maintain, restore, and improve riparian and wetland habitat throughout the SPRNCA, should result in long-term beneficial effects to desert pupfish and Gila topminnow and their riparian and wetland habitat. However, implementation of some riparian and wetland vegetation management projects may result in injury or mortality to either or both species and in damage to their habitat.



Should either species spread out along streams or wetlands or be transplanted to new sites over time, the risk of adverse effects on individuals may increase. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

The limited use of herbicide and mechanical vegetation treatments in riparian areas to restore riparian function may or may not benefit desert pupfish and Gila topminnow by improving riparian and aquatic conditions in the long-term. About 10 acres of riparian habitat on the San Pedro River will be treated over the life of the plan but effects to desert pupfish and Gila topminnow would depend on the specific objectives and location of the treatments, to be determined during project-level planning. In most cases, site-specific implementation of management actions will be designed with the intent of improving the quality of vegetation for the long-term benefit of federally listed species habitat, including that for desert pupfish and Gila topminnow. However, while implementing riparian and wetland projects, there may be some localized, short-term adverse effects (e.g., trampling of aquatic habitat and stream banks, injury or mortality, and localized changes in wetland and riparian vegetation type and densities).

Additionally, the use of herbicides has risks associated with direct exposure, indirect exposure through bioaccumulation in food items, and loss or damage to habitat. Details of the ecological risk assessments can be found in the Final Biological Assessment, Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007). Although a biological opinion was issued for this program (#FWS/AES/DCHRS/027171), the biological opinion was programmatic with no project level analysis, instead stating that all specific actions carried out under the PEIS would also undergo consultation. Therefore, future project level section 7 analysis for herbicide use on SPRNCA will be required. Implementation of conservation measures, such as selecting herbicides that can be safely applied in aquatic areas, should reduce the likelihood of impacts to desert pupfish and Gila topminnow.

The RMP provides for actions to enhance or create fish and wildlife habitat. Restoration and maintenance of natural (St. David Ciénega), modified (Little Joe Wetland), and artificial artesian-fed wetlands (Dunlavy 1, 2, 3; Whitehouse Wetland; and Kolbe Wetland) would likely include excavation, occasional burning, and herbicide applications to individual plants for removal (e.g., tamarisk). In occupied areas or areas where desert pupfish and Gila topminnow are released and a population established, long-term beneficial effects are anticipated over the life of the RMP. Short-term adverse effects may occur in areas that are occupied from the disturbance required to restore wetlands and manage vegetation. For example, restoration has been done successfully at Little Joe Spring (Little Joe Wetland), which now supports a large population of desert pupfish. Other restored or created wetlands may support populations of desert pupfish and Gila topminnow in the future, thereby contributing to recovery of both species.

Restored wetlands can replenish groundwater over large areas of land. This shallow groundwater source would provide a water source to streams and rivers under low-flow conditions in late spring and early summer. Currently, runoff in the basin surrounding St. David Ciénega is being directed to irrigate old fields via a system of abandoned constructed ditches. Projects that restore processes and functions would lead to the water capture of runoff and allow for infiltration of this water into the surrounding aquifer. Wetlands are part of the hydrologic cycle that is interconnected by groundwater with riparian habitat that desert pupfish and Gila

topminnow use. By protecting and restoring sensitive wetland ecological sites and surrounding areas, aquatic habitat that supports or could support desert pupfish and Gila topminnow would be maintained or improved through wetland hydrological processes, resulting in a long-term beneficial effect on both species.

Disturbance associated with wetland restoration (e.g., excavation, occasional burning, herbicide applications to remove individual, however, may result in short-term adverse effects to desert pupfish and Gila topminnow in occupied areas. Furthermore, the restoration of wetlands to provide open water would attract bullfrogs that prey on desert pupfish and Gila topminnow. Likewise, the spread of nonnative sportfish by recreationists (i.e., anglers) could compound the predation problem on desert pupfish and Gila topminnow and would need to be controlled as well. In such cases, the aquatic habitat may need to be renovated, which is likely to cause injury or mortality to desert pupfish and Gila topminnow that cannot be salvaged. The use of bullfrog-proof fencing around the perimeter of restored and constructed artificial wetland ponds and bullfrog removal activities would help control bullfrog access to wetlands and establishment in wetlands. This would have a beneficial effect on desert pupfish and Gila topminnow.

The use of livestock-proof fencing (steel tubing construction) around the perimeter of restored and constructed artificial wetland ponds would help maintain habitat integrity (e.g., bank sheering and clay soil compaction) and reduce the loss of desert pupfish eggs or injury to desert pupfish and Gila topminnow from livestock that enter these areas. Control of nonnative aquatic species is also discussed in the Fish, Wildlife, and Special Status Species section.

Aquatic habitat loss and degradation is a major threat to the desert pupfish and Gila topminnow. As part of riparian vegetation management, channel treatments would be used to improve geomorphology, which is the foundation for riparian processes, including overbank flooding (recharge), riparian vegetation establishment, riparian plant species and age diversity, aquatic habitat diversity, and wetland creation. Stream channel geomorphology would also be enhanced by installing soft structures, such as vegetation or posts, in streams to increase meandering and sinuosity.

However, the channel treatments coupled with vegetation treatments would have long-term beneficial effects on aquatic habitat by promoting the development of channel processes that are more dynamic and the development of vegetation communities with a greater diversity of aquatic habitat types and vegetation structure that can influence water temperature and productivity. This would be beneficial for both desert pupfish and Gila topminnow. Additionally, treatments would be carried out in phases over several years and monitored to help instruct adaptive management to improve effectiveness and reduce any adverse effects observed to the habitat.

New recreation developments would be designed to minimize effects on riparian vegetation and aquatic habitat; this would limit the potential for adverse effects on desert pupfish and Gila topminnow and their habitat. By limiting foot trails to the upper banks and spur tails on lower banks to short segments along stream courses and by maintaining their integrity, bank stability would be maintained, which is fundamental to maintain the aquatic habitat integrity important to both species. The maintenance of existing firebreaks would protect large tracts of riparian and

aquatic habitat from loss and modification due to wildfire. See the Wildland Fire section for an additional discussion of this issue.

### **Vegetation Management specific to Sandy Washes (Xeric Riparian)**

No effects to desert pupfish and Gila topminnow are likely from management of xeric riparian habitat.

### **Fish, Wildlife, and Special Status Species**

This RMP element, including, managing for priority species and supporting, maintaining, and restoring habitat and habitat connectivity is anticipated to have beneficial effects on the desert pupfish and Gila topminnow. However, some activities associated with implementation of this element, may adversely affect desert pupfish and Gila topminnow, including injury or mortality of both species and damage to their habitat. Should these two species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of adverse effects on individuals may increase. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

The protection of springs for wildlife should allow for the management of these habitats for the recovery of desert pupfish and Gila topminnow. The reintroduction and augmentation of desert pupfish and Gila topminnow populations as prescribed in the RMP would have beneficial effects on these species and contribute to their recovery. Aquatic areas on the SPRNCA not currently occupied by desert pupfish and Gila topminnow would be evaluated for suitability to support populations. Reintroduction of these species into areas free of nonnative predators would increase the number of individuals and populations that support species recovery. Continued surveys and control of nonnative invasive aquatic species in the reintroduction areas will ensure success of the reintroductions.

Other areas along the San Pedro with suitable physical habitat but currently with nonnative species may support desert pupfish and Gila topminnow in the future, if nonnative predators are actively controlled or eliminated. Areas that are likely to support suitable physical habitat are St. David Ciénega, Curry Draw (Murray Springs), Government Draw, Little Joe Wetland, and the three Dunlavy ponds. Habitat occupied by nonnative western mosquitofish (*Gambusia affinis*) would support Gila topminnow if mosquitofish were controlled or eliminated. New and emerging technologies may make such an eventuality possible over the next 25 years.

Active management of nonnative fishes is required to establish desert pupfish and Gila topminnow and, in the long-term, the effect of controlling nonnative, invasive aquatic species is anticipated to be beneficial to desert pupfish and Gila topminnow populations and contribute to the recovery of both species. That said, management actions to survey for nonnative, invasive aquatic species periodically and control or remove them, as necessary, can result in injury or mortality where these two species co-occur with the targeted nonnatives.

The continued management of beaver populations, including augmentations, on the San Pedro River will result in the continued localized increases in the water table, which should promote the long-term establishment of riparian habitat and create ciénega-like habitat that could benefit desert pupfish and Gila topminnow. This effect would likely be enhanced with stream channel

restoration, as increased sinuosity may reduce stream power below the threshold that washes out beaver dams. This would have a beneficial effect on desert pupfish and Gila topminnow habitat, as it would improve hydrological and channel processes. Any new beaver management activities that may affect this species would require reinitiation of the consultation on the beaver reintroduction to SPRNCA completed in 1998 (#2-21-97-F097). Therefore, no additional analysis of effects related to beaver management will be included in this consultation.

Work related to the fish barriers on Murray Springs and Government Draw may occur in locations that desert pupfish and Gila topminnow occupy. Adverse effects, such as displacement, injury, or mortality of a small number of individuals are possible during construction or maintenance of these structures. Stream segments in Curry Draw and Government Draw above the barriers would be kept free of nonnative fish and, possibly, crayfish for the benefit of an entire native aquatic vertebrate community, including desert pupfish and Gila topminnow.

### **Wildland Fire and Management**

SPRNCA will continue to have an estimated 610 acres of firebreaks, of which 580 acres are on BLM-administered lands and 30 acres are on adjacent lands. The general location and number of firebreaks will continue throughout the life of the plan. Any effects on federally listed species and critical habitat were considered in the Gila District Hazardous Fuels Reduction consultation (Biological Opinion 02EAAZ00-2015-F-0431) and therefore will not be addressed in this biological opinion. Reinitiation of this consultation may be required once populations of either desert pupfish or Gila topminnow are planned for establishment in or near treated areas.

### **Cultural Resources**

No effects on desert pupfish and Gila topminnow are likely from management of work related to the stabilization and rehabilitation of cultural sites, as these sites do not occur on stream banks or in aquatic habitats.

### **Native American Concerns**

Collection of plants by local Native American tribes may result in a short-term (minutes to a few hours) disturbance to habitat supporting desert pupfish and Gila topminnow on an infrequent basis over the life of the plan.

### **Visual Resources**

No effects on desert pupfish and Gila topminnow are likely from management of visual resources.

### **Paleontological Resources**

No effects on desert pupfish and Gila topminnow are likely from management of visual resources.

### **Livestock Grazing**

The USFWS and BLM consulted on the any potential effects to newly established desert pupfish and Gila topminnow populations from livestock grazing on the four SPRNCA allotments through the consultation on Aquatic Species Conservation at the San Pedro Riparian and Las Ciénegas

National Conservation Areas, Arizona (Biological Opinion #22410-2008-F-0103). The proposed action is to continue grazing as was consulted on in the consultation cited above. Therefore, no additional consultation related to livestock grazing is required.

### **Recreation and Travel Management**

The effects of recreation and travel management are combined because they are closely interrelated. Recreation management provides for recreation and education opportunities within the SPRNCA. Recreation on the SPRNCA includes hiking, picnicking, backcountry camping, wood collecting for campfires, hunting (including with dogs), bullfrog gigging, fishing, bird watching, wading, swimming, stargazing, horseback riding, and mountain bike riding. Travel management on the SPRNCA establishes travel and transportation management designations to support multiple resource management objectives. Recreation and travel management are likely to result in short- and long-term adverse effects to the desert pupfish and Gila topminnow. Some components of recreation and travel management, however, may benefit both species. For example, recreation and travel management-related education and information specifically targeted at conservation is likely to have a beneficial effect on both species. Recreational and educational sites with themes based on resource conservation using scientific research and wildlife programs to assure the preservation of resource management objectives, including conservation of federally listed species, could have a significant beneficial effect on desert pupfish and Gila topminnow. Additionally, ongoing fishing, gathering crayfish, and hunting bullfrogs on the SPRNCA will reduce the number of these predatory nonnative species, thereby benefitting desert pupfish and Gila topminnow. Fishing generally reduces sportfish numbers and selects for larger size classes of fish, which anglers usually retain.

Because riparian areas and waterways are popular recreation spots, the BLM expects recreational activities on the SPRNCA will increase as the human population increases. The area of riparian habitat that may be affected by recreational activities on roads and trails (e.g., through bank trampling and capture of flood flows by trails that can change the aquatic habitat character) is estimated by BLM at 605 acres of Fremont cottonwood-Goodding's willow vegetation type, much of which has perennial aquatic habitat. While recreational activities may increase over time, recreation will likely continue to be localized around high-use areas at bridges, at trail segments near bridges and trailheads, and adjacent to rural communities, although some dispersed recreation will also continue to occur.

Adverse effects to the desert pupfish and Gila topminnow habitat from recreational activities (e.g., hiking, horseback riding, water play) may include trampling herbaceous riparian and wetland plants; reduced vegetation, especially where trails are located on the toe of floodplains and river banks; compaction of stream bank soil under certain conditions; minor amounts of additional soil erosion and sedimentation into waterways. Recreational use on the SPRNCA can cause trails from becoming erosion features that could adversely affect desert pupfish and Gila topminnow habitat through alteration in bank and floodplain processes and function related to channel and floodplain stability and groundwater recharge. Trails have become incised in the past due to human use; however, increased trail monitoring and maintenance could prevent adverse effects to desert pupfish and Gila topminnow habitat from continued and possibly increased trail use. Should recreational activities occur off trails, trampling of habitat and decreased water quality may occur in riparian or wetland habitat along the San Pedro River,

Little Joe Wetland, Horsethief Draw, Curry Draw (Murray Springs), or other areas where desert pupfish and Gila topminnow are transplanted for species recovery.

Furthermore, various recreational activities (hiking, horseback riding, fishing, water play) could disturb, injure, or kill desert pupfish and Gila topminnow. For example, use of trails to access fishing spots along streams; camping along waterways; swimming; and wading are likely to disturb normal activity of both species when habitat is occupied and may result in some loss of desert pupfish eggs. Injury or mortality from direct contact of hikers and horseback riders with juvenile and adult fish of either species is possible, but unlikely. Unless the trampling is heavy and frequent, adverse effects to desert pupfish and Gila topminnow are likely to be transient, but are likely to occur over the life of the RMP. Recreational users can also move sport fish from other places to the SPRNCA. Moving nonnative fish into habitats with desert pupfish and Gila topminnow could cause the loss of a population and require removal of the nonnative fish and restocking of desert pupfish and Gila topminnow.

Maintenance of trails should benefit desert pupfish and Gila topminnow by preventing or minimizing erosion and sedimentation of occupied or potential habitat. Mowing to maintain trailhead areas and trail segments that are prone to vigorous grass and forb growth are not anticipated to affect desert pupfish or Gila topminnow as mowing will not occur near aquatic habitat.

As part of travel management, about 202 miles on the SPRNCA route (trails and roads) inventory would be evaluated. Use and maintenance of existing roads should not affect desert pupfish and Gila topminnow because they do not occur near aquatic habitat. There are 4 miles (1.2 acres) of planned trails; however, the actual number and location of trails could change based on implementation-level travel management planning. If new travel routes in potential habitat are designated (as part of travel management), then impacts to desert pupfish and Gila topminnow habitat may occur. Conversely, the decommissioning of travel routes will likely be beneficial for desert pupfish and Gila topminnow occupied or potential habitat. Development of trails connecting adjacent communities on private lands to the San Pedro Trail system would increase the frequency of use in habitat that desert pupfish and Gila topminnow occupy, resulting in some level of additional adverse impacts similar to those discussed in this section. However, the number and locations of these linkages to the communities peripheral to the SPRNCA has not been determined. Potential impacts from travel management should be minimized as BLM plans to consider species protection when planning for new routes. The effects of new or decommissioned routes will be analyzed through project level section 7 consultation.

Should either species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of damage to individual patches from recreational and travel management activities would increase. However, increasing the number of locations at which either species occurs would contribute to the recovery of the species.

### **Lands and Realty**

Overall, this RMP element which includes managing lands to conserve their aquatic and riparian values, will likely benefit the desert pupfish and Gila topminnow. For example, closing SPRNCA to commercial energy development should be beneficial to both species, as it would

exclude activities associated with such development that may adversely affect habitat and normal activity patterns. Land acquisition may benefit the conservation of desert pupfish and Gila topminnow depending on the location of parcels acquired.

Some actions associated with Lands and Realty may adversely affect desert pupfish and Gila topminnow. There are a number of ROWs on the SPRNCA; these include 3 utility corridors (Charleston Road utility corridor, El Paso Gas Line, and Tombstone Water Line) and 5 road and highway corridors (Charleston Road, Hereford Road, Highways 80, 90, and 92). These ROWs total 5,120 acres. Ongoing operation and maintenance of these ROWs could result in adverse effects to desert pupfish and Gila topminnow where they intersect or are near suitable habitat. The renewal and possible changes to these ROWs could adversely affect desert pupfish and Gila topminnow. Currently, El Paso Gas Line and Tombstone Aqueduct cross aquatic habitat that desert pupfish and Gila topminnow may use. Should desert pupfish and Gila topminnow become established in areas near the El Paso Gas Line and Tombstone Aqueduct, there could be adverse effects from destabilizing habitat, which may predispose it to erosion (loss). The Charleston Road ROW utility corridor runs through a perennial portion of the San Pedro with riparian habitat, so possible changes made to its configuration could adversely affect desert pupfish and Gila topminnow in the future should they become established in this portion of the SPRCA. Potential impacts to desert pupfish and Gila topminnow from renewing existing ROWs could be reduced if new possible stipulations to reduce impacts to the conservation values of SPRNCA are implemented. Changes to existing ROWs that may affect listed species or critical habitat would be subject to additional section 7 consultation.

Areas outside of the Charleston Road ROW utility corridor would be considered for new ROWs if they allow for the following: access to private property in holdings when there is no other reasonable access across nonfederal land and for emergency, public safety, and administrative uses. However, according to the BLM, the probability of authorizing new ROWs that meet these requirements is remote, and any potential effects on federally listed species or critical habitat would require section 7 consultation.

Other leases and permits would be allowed on the SPRNCA (e.g., activities less than 1 acre in ground disturbance, filming permits, geophysical exploration) and activities associated with such leases and permit could result in impacts to desert pupfish and Gila topminnow. However, because 1) these leases and permits would only be allowed if they further the primary purposes for which the conservation area was established, and 2) such activities are likely to occur over small areas and for limited or intermittent periods, potential adverse effects to desert pupfish and Gila topminnow from such activities will likely be minimal or avoided altogether.

Should the species spread out further along streams or wetlands or be transplanted to new sites over time, the risk of adverse effects on individuals would increase as a result of implementing Lands and Realty activities. However, increasing the number of locations at which the species occurs would contribute to the recovery of the species.

### **Wild and Scenic Rivers**

The Wild and Scenic Rivers goal is to preserve, protect, and enhance study river values on the SPRNCA. The Wild and Scenic River management action to remediate hazardous material from

abandoned mines is anticipated to have a beneficial effect on desert pupfish and Gila topminnow through the reduction of direct exposure to contaminants or indirect exposure through the food chain.

### **CUMULATIVE EFFECTS - DESERT PUPFISH AND GILA TOPMINNOW**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Close to 50 percent of lands within the action area are managed by Federal agencies; thus, many activities that could potentially affect Huachuca water umbel and its critical habitat are Federal activities that are subject to section 7 consultation. The effects of these Federal activities are not considered cumulative effects. However, a portion of the action area also occurs on private and state lands. Residential and commercial development, road construction and maintenance, groundwater extraction, surface water diversion, farming, livestock grazing, mining, off-highway vehicle use, recreation, introduction and proliferation of nonnative invasive species, water contamination, and other activities occur on these lands and are expected to continue into the foreseeable future. These actions, the effects of which are considered cumulative, may result in mortality and injury of desert pupfish and Gila topminnow and loss, fragmentation, modification, and degradation of their habitat.

For example, new housing (i.e., Villages at Vigneto, Tribute, Ventana De Flores, and Bella Vista Ranches) planned for the area is estimated to cover 18,270 acres (a small portion of which is covered via section 7 analysis, but the majority of impacts to this acreage has not been subject to consultation). These projects will result in permanent loss of habitat, increased water use, and would change watershed runoff characteristics in the form of increased runoff rates causing increases in peak flows that can cause accelerated erosion (incision) in ephemeral drainages, streams and the San Pedro River they feed. This could adversely habitat for desert pupfish and Gila topminnow.

During the 2010 Census, Arizona grew more than 20 percent between 2000 and 2010, and it is predicted that Arizona would be the second fastest growing state in the country through 2030. If these predictions are true, already severe threats to groundwater that supplies riparian and aquatic habitat (that desert pupfish and Gila topminnow use) would worsen, primarily due to increased human demand for surface and groundwater. Thus, probably the most significant cumulative effect on desert pupfish and Gila topminnow use includes continued local and regional groundwater depletion because it is minimally regulated by the State of Arizona. Groundwater is used faster than the aquifer can recharge in many developed areas of Arizona including the upper San Pedro basin.

Surface water is diverted at the St. David Diversion near St. David, Arizona. This diversion, which is expected to continue into the future, affects the availability of surface water in the San Pedro River in the spring and early summer on an annual basis. This has an adverse effect on aquatic habitat available to desert pupfish and Gila topminnow on the SPRNCA. Hunting and trapping activities regulated by the state. The loss of beaver would have an adverse impact on



aquatic species as resilience to long-term drought and increasing temperatures through a reduction in recharge reducing wetland water levels and stream flows. Ponds in the basin may hold predacious nonnative fishes and act as sources for bullfrogs that may immigrate to habitats on the SPRNCA and other lands with desert pupfish and Gila topminnow. Ponds in the adjacent watershed may also support bullfrogs that could periodically immigrate to the SPRNCA during wet periods, making their eradication from the SPRNCA and the basin difficult. People surreptitiously moving fish from other areas of the state and releasing them into SPRNCA or elsewhere in the basin poses an ongoing potential for adverse effects to desert pupfish and Gila topminnow.

Livestock grazing on non-federal lands is expected to continue in the action area, which may adversely affect watershed function including alteration and subsequent changes in the natural flow regime, sediment production, stream channel morphology, runoff rates, and recharge, thereby affecting desert pupfish and Gila topminnow. Trespass livestock (from non-federal areas) along the San Pedro River and St. David Ciénega are likely to continue to result in some effects to desert pupfish and Gila topminnow through the risk of localized trampling and discrete areas of habitat damage.

In addition to the aforementioned activities, illegal activities associated with cross-border smuggling and illegal immigration (e.g., human traffic, deposition of trash, creation of trails and routes, and increased fire risk from human traffic) also occur and are anticipated to continue to occur in the action area. These activities can also degrade desert pupfish and Gila topminnow habitat. Other unregulated non-federal activities that can directly or indirectly affect desert pupfish and Gila topminnow and its habitat are expected to continue to occur in the action area (e.g., inappropriate use of OHVs, increased or improper use of herbicide).

In addition to adverse cumulative effects, some beneficial effects are likely from various activities in the action area in the future as well. For example, beneficial cumulative effects on desert pupfish and Gila topminnow habitat may occur where private and other landowners are returning their property to native upland plant communities. Improved vegetation cover generally improves watershed function and hydrologic cycle favoring groundwater recharge. The Hereford Natural Resource Conservation District has promoted watershed restoration and vegetation conversion to semidesert grassland, as has Fort Huachuca. Implementation of recharge projects by the Cochise Conservation and Recharge Network projects (13,510 acres) and wastewater effluent recharge project associated with the Sierra Vista Environmental Operations Park are likely to continue to provide a source of groundwater to offset groundwater extraction used for municipal and rural uses. This is likely to continue to benefit desert pupfish and Gila topminnow.

The potential effects of long-term drought and hotter average temperatures (climate change) are likely to result in the future loss or reduction of semidesert grasslands, aquatic, wetland, and riparian habitats. The loss of aquatic, riparian, and wetland habitat is likely to be compounded by continued depletion of groundwater in the basin by a variety of uses unless the current trend is reversed. Hotter, drier conditions are likely to also result in a higher risk of fires in riparian areas or surrounding mountains, which are areas critical to aquifer recharge. With the improvement of watershed, stream channel conditions, beaver activity, and recharge projects on the SPRNCA, it

is anticipated that the resiliency of the ecosystem to these atmospheric conditions may be improved to the point where surface water, wetlands, and large areas of riparian habitat are protected from loss or large-scale reduction that otherwise would occur. This would have a beneficial effect on desert pupfish and Gila topminnow.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS - DESERT PUPFISH AND GILA TOPMINNOW**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Conclusion - Desert Pupfish and Gila Topminnow**

After reviewing the current status of the ocelot, the environmental baseline for the action area, the effects of the proposed SRPNCA RMP, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the desert pupfish and Gila topminnow. No critical habitat has been designated for these species, therefore, none will be affected. We base this conclusion on the following:

- The SPRNCA RMP does not make site-specific decisions about exactly how, when, and where these activities will be carried out;

- The proposed action is a “framework programmatic action” which establishes a framework for the development of specific future action(s) but does not authorize any future action(s); and
- Any future-project specific activities under the SPRNCA RMP that may affect the desert pupfish and Gila topminnow will receive additional Service review and/or section 7 consultation as appropriate and are described in the proposed action above.

The conclusions of this programmatic biological opinion are based on full implementation of the project as presented in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

### **INCIDENTAL TAKE STATEMENT- DESERT PUPFISH AND GILA TOPMINNOW**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed action described above is a “framework programmatic action” as defined in 50 CFR 402.02. In accordance with 50 CFR 402.14(i)(6), an incidental take statement is not required at the programmatic level for a framework that does not authorize future actions; incidental take resulting from any action subsequently authorized, funded, or carried out under the program will be addressed in subsequent section 7 consultation, as appropriate. This biological opinion provides a broad-scale examination of the proposed action’s potential impacts on desert pupfish and Gila topminnow, but we lack reasonable certainty of where, when, and how much incidental take may occur. Therefore we have not quantified the amount and extent of incidental take that may result from the proposed action and have not exempted such take in this biological opinion.

### **CONSERVATION RECOMMENDATIONS - DESERT PUPFISH AND GILA TOPMINNOW**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to

help implement recovery plans, or to develop information. We recommend the following to BLM:

1. Continue to assist FWS and the AGFD in conserving and recovering the listed fish.
2. Continue to assist FWS with the completion and implementation of the recovery plans for the listed fish.
3. Implement recovery actions identified in the recovery plans.
4. Continue to work with the FWS and AGFD to remove non-native species and reestablish the listed fish throughout their historical range in Arizona.
5. Continue to work cooperatively with FWS and AGFD to establish populations of these species wherever possible.
6. Continue to identify factors that limit the recovery of these and other listed species on BLM lands and work to correct them.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

### **REINITIATION NOTICE**

This concludes formal consultation for the SPRNCA RMP. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from [FWS Migratory Bird Program web page](#) and [FWS Permits Application Forms](#). For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal

Register on June 5, 2007, as well at the Conservation Assessment and Strategy for the Bald Eagle in Arizona ([Southwestern Bald Eagle Management Committee website](#)).

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying the following Tribes of its completion [San Carlos Apache, Hopi, Pascua Yaqui Tribes and the Salt River Pima-Maricopa Indian Community]. We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

We appreciate the BLM's efforts to identify and minimize effects to listed species from this project. Please refer to the consultation number, 02EAAZ00-2019-F-0122 in future correspondence concerning this project. Should you require further assistance or if you have any questions, please contact Marit Alanen, Erin Fernandez, Scott Richardson, or Julie McIntyre at 520-670-6150 (extension 234, 238, 242, or 223 respectively).

  
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## APPENDIX A: CONCURRENCES—JAGUAR

This appendix contains our concurrence with your “may affect, not likely to adversely affect” determinations for the endangered jaguar (*Panthera onca*) and its critical habitat.

- Because the proposed project does not occur within or adjacent to any jaguar critical habitat, there is no anticipated effect to jaguar critical habitat.
- Outside of critical habitat, vegetation within the watershed may improve over time as available water sources are protected and conserved for the benefit of aquatic, wetland, and riparian resources. Additionally, temporary disturbance to any potential jaguar habitat will be minimal and other areas within the SPRNCA are readily available. Therefore, potential effects to jaguar habitat are insignificant and possibly beneficial.
- One jaguar was documented as recently as March 2017 in Huachuca Mountains, which is approximately 15 miles west of the project area. This jaguar was known to have died in Mexico in June 2018, although the project area may fall within the range of a jaguar in the future. However, because the SPRNCA does not include the rugged terrain preferred by jaguars, there is a low likelihood that jaguars will occur in the area during RMP project activities. If, however, jaguars do occur in the area during project activities, these activities could disturb jaguars. Based on the project activities and habitat described in the BA, habitat would be available within and adjacent to the project area (ephemeral drainages). We anticipate that any jaguars in the immediate area would avoid project activities and use nearby habitat. This potential change of behavior would be relatively minor (i.e., jaguars would not have to travel far to avoid project activities) and short-term (i.e., project activities would last from a few hours to a few months over the life of the RMP). Furthermore, project activities will not occur during the nighttime when jaguars are most active. Therefore, any potential effects (from disturbance caused by project activities) to jaguars from the proposed project are insignificant.