

T-2-9

ARIZONA STATE WILDLIFE GRANT SEGMENT 9
WORK PLAN

JULY 1, 2012 - JUNE 30, 2014

Little Colorado spinedace - see pages 27-29

[See AZ State Wildlife Action Plan 2012-2022](#)

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T-2-9
STATE WILDLIFE GRANT
WORK PLAN
FOR
ARIZONA WILDLIFE CONSERVATION IMPLEMENTATION
GRANT SEGMENT 9
July 1, 2012 - June 30, 2014

INTRODUCTION

This Work Plan provides information on projects that will be conducted by the Arizona Game and Fish Department (hereafter Department or AGFD) under the State Wildlife Action Plan (SWAP) as part of the State Wildlife Grant Segment 9 (SWG).

GEOGRAPHIC LOCATION OF PROJECT

Fieldwork will be conducted statewide on State, Federal, private, and Native American lands, and as necessary in other states, Canada, and México. Fieldwork on private and Native American lands will be conducted only with prior approval from the landowner. Administrative work will be carried out in one of the Arizona Game and Fish Department's seven offices statewide. Work may be conducted in other states or countries cooperatively and at their request provided that the proper authorities are conveyed by that state or nationality. States immediately adjacent to Arizona, as well as the states in México and Canada, represent the majority of where any out-of-state work would occur. Specific locations are provided per sub-project.

FUNDING STATEMENT

Known and potential matching sources of funding for work under this Project include, but are not limited to: Game and Fish license revenues; voluntary Nongame Wildlife Checkoff contributions; Arizona Heritage Funds (State Lottery revenues); Wildlife Conservation Fund; contracts and agreements with other State agencies, Native American Tribes, and private partners (e.g., conservation organizations, private industry); and voluntary private donations.

FEDERAL PROGRAMMATIC COMPLIANCE

Administrative and conservation planning functions for this work plan will proceed in full compliance with the National Environmental Policy Act (NEPA), and where appropriate, other Acts of the United States Congress including the Endangered Species Act (ESA). Documentation under NEPA, and consultation under ESA when appropriate, will be completed for each planned action prior to implementation.

Other activities and/or projects have existing EACs as noted in the Appendix at the end of the Work Plan. Activities determined to fall outside of existing Federal compliance will be evaluated through the Department's Environmental Assessment Checklist process.

PROJECT PERSONNEL

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Project Assistants: Regional Fisheries Program Managers, Specialists, and Assistants
Regional Habitat Program Managers, Specialists, and Assistants
Regional Wildlife Program Managers, Specialists, and Assistants
Any Department personnel, and any agency cooperators, contractors, and trained volunteers considered as Designated Agents by the Department.

PROJECTS

The following Projects address conservation needs and activities for all nongame species in Arizona, including, but not limited to, those found on the 2012 list of Species of Greatest Conservation Need (SGCN) located at http://www.azgfd.gov/w_c/cwcs.shtml; federally listed threatened, endangered, and candidate species in Arizona; species found on the 1988 Threatened Native Wildlife In Arizona; and 1997 Draft Wildlife of Special Concern in Arizona (WSCA). Under the Department's statutory authority and the Cooperative Agreement with the USFWS, all species are eligible for work in accordance with this work plan. Activities to be carried out include survey, monitoring, research, and other site and species management functions, as well as administrative, planning, and evaluation functions.

AGFD will prepare annual interim performance reports, or a completion report as appropriate. The reports will provide information on the Approach sections as described within each Project.

PROJECT 1: ADMINISTRATION, COORDINATION AND PLANNING TOTAL = \$203,096

Principle Investigator – Eric Gardner

SUB-PROJECT 1: STATEWIDE ADMINISTRATION, COORDINATION AND PLANNING
NEED

An effective administration project requires the commitment of professional and administrative staff, who are responsible for conservation planning, project management and supervision of staff (see Arizona SWAP p. 96, and examples pp. 114 - 141).

OBJECTIVES

- Support professional and administrative staff located in the AGFD headquarters and regional offices around the state that engage in conservation planning.
- Project administration and provide administrative support.
- Supervision to field staff engaged in implementation of this work plan.

EXPECTED RESULTS AND BENEFITS

- Provide administration and coordination, including conservation planning, project management and supervision of staff engaged in the specific projects detailed below.
- Develop conservation programs that are mutually acceptable to USFWS and AGFD for Federally-listed and other nongame species of wildlife in Arizona.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Perform general administrative duties.
- Assist in developing and revising planning documents, permits, and annual performance reports relevant to nongame wildlife management.
- Coordinate and supervise the implementation of SWG projects.
- Provide administrative support for SWG projects and related personnel.
- Coordinate and produce SWG grant documents and reports.
- Develop and submit an annual performance report on all activities pertaining to this Project; develop new work plans for subsequent SWG Segments.
- Produce technical reports, peer-reviewed and popular publications, etc., as necessary, summarizing activities, and to communicate activities to the public and scientific communities.
- Maintain motor pool.
- Conduct employee supervision and routine administrative procedures.
- Photo document Project activities.
- Provide information for the development of Commission Orders (C.O. 13, 14, 25, 40, 41, 42 & 43) and other rules and regulations regarding harvest of wildlife.
- Seek internal and external grants and contract opportunities that support project priorities.
- Coordinate administration of all AGFD conservation activities, including those conducted with or through agents and external cooperators.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Create, finalize, implement, and maintain databases to track population trends of all species.
- Submit species occurrence information to HDMS for integration into the AGFD computerized database.
- Enhance and maintain the SWAP database.
- Track changes to species status through the SWAP database.
- Enhance, maintain, and use HabiMap™ Arizona (a web-based geospatial database and map built to display the spatial components of the SWAP).
- Automate workflows to facilitate data transfer between the SWAP database and HabiMap™ Arizona.
- Enhance and maintain the technical infrastructure associated with HabiMap™ Arizona.
- Attend or make presentations at conferences, workshops, and other meetings to increase awareness and disseminate information about SWAP data and HabiMap™ Arizona.
- Fulfill SWAP associated data requests.
- Develop, maintain, and refine Species Distribution models identified in the SWAP.
- Develop, maintain, and refine Threat Distribution models identified in the SWAP.
- Maintain the Species and Habitat Conservation Guide and associated sub-models as defined in the SWAP.
- Provide GIS support for SWAP related activities.
- Coordinate with other states, Canada, México, and other Latin American countries to exchange information.

Technical Assistance – Environmental Review – Review of Proposed Projects

- Participate in project evaluations.
- Participate in review of scientific collecting permit requests.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Participate in meetings to identify and prioritize conservation opportunities and needs.
- Develop and maintain diverse conservation partnerships.
- Develop Conservation Strategies, Assessments, and Agreements to address the needs of non-listed species of concern so effectively that the need for Federal listing is minimized or eliminated.
- Develop recommendations and guidelines for the management of populations and their habitats.
- Identify research and management needs, habitats, and specific sites important for conservation.

Land and Water Rights Acquisition and Protection – Conservation Area Designation

- Protect sensitive species (e.g., bald eagle) breeding activities by working with land managers to designate sensitive species breeding area closures.

Planning-Species and Habitat Management Planning-Listed Species Recovery Planning

- Participate in recovery teams, recovery implementation teams, advisory teams, habitat conservation planning teams, conservation teams, management oversight groups, technical advisory committees, and other entities convened to address conservation of Federally-listed species and other species of concern to Arizona and México.
- Write or revise recovery plans, recovery plan addendums, conduct status reviews, etc.

Partner Engagement – Non-governmental Agency

- Develop strategies and mechanisms for public involvement in planning and carrying out actions pursuant to the Department's SWAP, and for conflict resolution with interested and affected parties.
- Attend or make presentations at conferences, training workshops, and other meetings to increase awareness and disseminate information about nongame wildlife and threats to SGCN and their habitats.

Partner Engagement – Others.

- Communicate project information to public and cooperating partners through popular and technical publications, educational presentations, field trips, wildlife fairs, media news releases, and personal presentations at scientific conferences, workshops, and public events.
- Implement public relations and techniques including media events and documentaries at selected sites under the supervision of a permitted biologist.
- Participate at regional, national, and international wildlife conferences, scientific meetings and training.
- Investigate the potential for “citizen science” programs that might assist the Department in management of nongame wildlife.

Note – Outreach will not consist of more than 10% of this sub-project's budget.

Planning-Species and Habitat Management Planning-Species Management Planning

- Provide technical support and expertise in the development of statewide watershed management and/or site management plans for aquatic SGCN species.

LOCATION

Statewide, other states, Canada, México, and other Latin American countries

TIMELINE

Annually – Year-round.

BUDGET

\$203,096

PROJECT 2: INVERTEBRATE CONSERVATION AND RECOVERY TOTAL = \$25,000

Principle Investigator – Jeff Sorensen

SUB-PROJECT 1: DETERMINING SGCN MOLLUSK STATUS AND RESEARCH NEEDS

NEED

Over 220 species of native mollusks occur statewide in Arizona, and 27 of these are identified as Tier 1A/1B SGCN in Appendix E of the 2012 Arizona SWAP. Some native mollusks are rare or at risk from numerous threats such as loss or degradation of habitat, groundwater use, catastrophic wildfires, and invasive exotic species. Given the potential for exposure to stressors, small scale, site-specific research or enhancement might be required for effective conservation of SGCN mollusks. In addition, very little is known about most of the State's mollusks, particularly their status, distribution, threats, and population demographics. The lack of this information is a contributing factor in the ranking of mollusks as SGCN. Community surveys are needed to fill information gaps for these species and to help determine their management needs and future research. These needs are identified in the Arizona SWAP through monitoring objectives in pp.146-153, including monitoring unknown status species.

OBJECTIVES

- Document the current status of SGCN mollusk species by gathering information on historical and present distributions, habitat associations, threats, and general natural history.
- Conduct surveys, monitor populations and habitats, and identify management potential for specific sites.
- Collect a limited number of specimens from historical and newly identified locations for taxonomic analysis, genetics, research, propagation, and/or to establish new wild or captive populations.
- Identify essential habitats, research needs, and other management recommendations.
- Train partners to survey and monitor SGCN mollusks.

EXPECTED RESULTS AND BENEFITS

- Current data on the status and distribution of SGCN mollusks and their habitat will allow managers to plan for or react to changes in land management, develop prescriptions for dealing with invasive species, identify research needs, and assess the need for refuge populations and/or habitat improvements or protections.
- Recent data on SGCN mollusks will be used to update 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, to develop or revise recovery plans and/or conservation agreements, and drafting progress reports.

APPROACH

Planning-Species and Habitat Management Planning-Listed Species Recovery Planning

- Assist the USFWS in developing a recovery plan for the San Bernardino springsnail.

Planning-Species and Habitat Management Planning-Habitat Conservation Plan Development

- Provide technical support and expertise to the USFWS, DOD, USFS, and other agency partners in developing a CCA(A) for Huachuca springsnail.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update databases for each species of SGCN mollusks surveyed.

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

Among the SGCN mollusks, the following species are prioritized for monitoring and surveys under this sub-project (page numbers given are in the Arizona SWAP): Niobrara ambersnail (*Oxyloma haydeni*; p.113), California floater (*Anodonta californiensis*; p.113), Fossil springsnail (*Pyrgulopsis simplex*; p.115), Huachuca springsnail (*P. thompsoni*; p.115), San Bernardino springsnail (*P. bernardina*; p.114), and Kingman springsnail (*P. conica*; p.115).

- Survey extant populations and historical localities for SGCN mollusks as needed to determine status or identify conservation opportunities. These surveys are planned and coordinated with agency partners and landowners, with a focus on assessing mollusk communities at sites visited. Standardized timed presence/absence sampling will be used for surveys (as described in the appendix of the Page Springsnail CCAA).
- Collect a limited number of specimens (up to 30 per site) from historical and newly identified locations for taxonomic analysis, genetics, and research.
- Support cooperators in surveys of potential habitat and historic locations of SGCN mollusks in Arizona and México, and in furthering our understanding of their taxonomy and genetics.
- Document impacts to SGCN mollusk populations and their habitat.

Create, Restore, or Enhance Habitat and Nature Process - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. crayfish, bullfrogs, and mosquitofish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for SGCN mollusks. Invasive species control is a minor aspect of the overall survey effort for SGCN mollusks.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on SGCN mollusks and their habitat.

LOCATION

Coconino County (for Niobrara ambersnail and Fossil springsnail),
Apache County (for California floater),

Cochise and Santa Cruz counties (for Huachuca springsnail),
Cochise County (for San Bernardino springsnail),
Mohave County (for Kingman springsnail), Arizona

TIMELINE

Annually – Year-round.

BUDGET

\$5,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement

SUB-PROJECT 2. PAGE SPRINGSNAIL

NEED

To further the conservation goals of the Page Springsnail Candidate Conservation Agreement (CCA), additional populations of this ESA candidate (and SGCN tier 1A) mollusk need to be discovered or established within its historical range of the Verde Valley in central Arizona. Annual monitoring of seven extant populations of Page springsnail (*Pyrgulopsis morrisoni*) on Department hatcheries in the Verde Valley is required by the CCA. The Arizona SWAP identifies Page springsnail monitoring and management as a priority action (p.114).

OBJECTIVES

- Discover or establish at least one new population of Page springsnail at a site enrolled under the CCA or under federal management.
- Protect or enhance springsnail habitat to improve population status.
- Reduce potential take of the species and habitat from various threats (primarily exotic animals) at known occupied sites.
- Monitor the seven extant populations of the species (occurring on Department hatcheries) and any newly discovered or established populations in the Verde Valley, and document habitat conditions with repeat digital photos.
- Train partners to survey and monitor the species.

EXPECTED RESULTS AND BENEFITS

- Additional meta-populations of Page springsnail are discovered or established on CCA-enrolled or Federal properties.
- New populations of Page springsnails may help preclude the need to list the species under the ESA.
- Protective or enhancement efforts for extant springsnail populations may improve their status and long-term survival.

APPROACH

Planning-Species and Habitat Management Planning-Habitat Conservation Plan Development

- Update and renew the Page Springsnail CCAA prior to October 2014.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Page springsnail database.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Monitor extant populations of the species on Department hatcheries in the Verde Valley, using standardized timed presence/absence sampling described in the appendix of the Page Springsnail CCAA.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Habitat

- Document habitat conditions of extant populations on Department hatcheries in the Verde Valley with repeat digital photos, and measurements of water quality, substrate type, and spring flow.
- Conduct site evaluations on habitat suitability, threats, site use and management by landowners, baseline conditions (including presence or absence of the species and other SGCN at the site), and conservation potential of sites.

Create, Restore, or Enhance Habitat and Nature Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. crayfish, Chinese mystery snails, and mosquitofish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for Page springsnails. Invasive species control is a minor aspect of the overall survey effort for this species.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on the species and its habitat.

LOCATION

Yavapai County, Arizona.

TIMELINE

Annually – spring and summer

BUDGET

\$5,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

- Take allowances as authorized under the Department's Page Springsnail CCAA 10(a)(1)(A) permit (TE-174351-0).

SUB-PROJECT 3. THREE FORKS SPRINGSNAIL

NEED

The Three Forks springsnail (*Pyrgulopsis trivialis*; ESA-listed as endangered and SGCN tier 1A species) is at risk of extirpation at extant sites in the White Mountains in eastern Arizona, due to predation by non-native crayfish and habitat disturbance by trespass livestock and elk wallowing. Protection of snail-occupied natural springheads with wire cages/fences and habitat improvements to historic springboxes may aid in the conservation of these rare springsnail populations. The Three Forks population is significantly reduced and may be lost entirely in a few years if its threats are not reduced or eliminated. The Arizona SWAP identifies Three Forks springsnail monitoring and management as a priority action (p.115).

OBJECTIVES

- Monitor the species to determine their status and conservation needs.
- Assist the USFWS and USFS in developing a recovery plan for the species.
- Test potential habitat restoration methods for the springsnail at two extirpated springboxes at Three Forks.
- Test the use of experimental enclosure cages/fencing to secure snail-occupied springheads from livestock and elk grazing and wallowing at Boneyard Bog and Boneyard Creek.
- Conduct baseline and post-treatment surveys of threats (presence/absence; reduction of threat impact; habitat improvement) and response by springsnails (natural recolonization from extant springs within the same spring complex).
- Train partners to survey and monitor the species.

EXPECTED RESULTS AND BENEFITS

- Habitat improvements and springhead protective cages/fencing may show an increase in springsnail abundance and occupancy at treatment sites, with a corresponding reduction of localized threats within those habitats.
- These conservation measures may help improve the stability of Three Forks springsnail populations in the short-term, until more permanent solutions are implemented to reduce their threats.

APPROACH

Planning-Species and Habitat Management Planning-Listed Species Recovery Planning

- Provide technical support and expertise to the USFWS and USFS in developing a recovery plan for the species.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Three Forks springsnail database.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Continue to monitor the species using standardized timed presence/absence sampling to determine their status and conservation needs.
- Conduct baseline and post-treatment surveys of threats and springsnails at control and treatment sites.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Habitat

- Document habitat conditions of occupied and extirpated sites with repeat digital photos, and measurements of water quality, substrate type, and spring flow.
- Conduct site evaluations on habitat suitability, threats, site use and management by landowners, baseline conditions (including presence or absence of the species and other SGCN at the site), and conservation potential of sites.

Data Collection and Analysis - Techniques Development - Habitat Restoration Methods (EAC in prep).

- Use on-site rocky fill material (surface only, no digging or trenching) to restore springhead habitat for the springsnail at two springboxes at Three Forks that no longer have resident populations of the snail present.

Create, Restore, or Enhance Habitat and Nature Processes – Grazing/Farm Management – Riparian Fence Installation (EAC in prep).

- Install experimental enclosure cages/fencing to secure snail-occupied springheads from livestock and elk grazing and wallowing at Boneyard Bog and Boneyard Creek. The number of enclosures installed is dependent on available funding.

Create, Restore, or Enhance Habitat and Nature Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for Three Forks springsnails. Invasive species control is a minor aspect of the overall survey effort for this species.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on the species and its habitat.

LOCATION

Apache County, Arizona.

TIMELINE

Annually – summer and fall

BUDGET

\$5,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.

SUB-PROJECT 4. KANAB AMBERSNAIL

NEED

The Kanab ambersnail (*Oxyloma haydeni kanabensis*; ESA-listed as endangered and SGCN tier 1A) is extant at two wild populations on the Colorado Plateau—one at Vaseys Paradise, Grand Canyon, and the other at the privately-owned Three Lakes, Utah. USGS-contracted monitoring of the Vaseys Paradise population is ongoing, with two to four seasonal surveys per year. This population is impacted by high river flows, reduced springflow due to prolonged drought, and to a lesser degree by habitat disturbance by recreational visitors. As a recovery action for this rare snail, a translocated population of ambersnails from Vaseys Paradise was reintroduced at another site in Grand Canyon (Upper Elves Chasm) in 1998. Since that time, the Upper Elves Chasm population has become established as self-sustaining and expanded its range of occupied habitat at that site. The Arizona SWAP identifies ambersnail monitoring and management as a priority action (p.114).

OBJECTIVES

- Monitor extant and translocated populations of the species in Grand Canyon National Park, and document habitat conditions with repeat digital photos.
- Reduce habitat loss at Vaseys Paradise due to high Colorado River flows, in coordination with agency partners of the Kanab Ambersnail Working Group.
- Train partners to survey and monitor the species.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Habitat removal and replacement efforts at Vaseys Paradise will reduce the habitat recovery times following high river flows, and may provide a more stable resident ambersnail population.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for the species with USFWS, USGS, USBR, NPS, and other agency partners.
- Organize and host Kanab Ambersnail Working Group meetings for agency partners.

- Provide technical support and expertise to the USFWS in completing a 5-year status review of the species, and—if warranted—a de-listing proposal for the species.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Kanab ambersnail database.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Monitor extant and reintroduced populations of this species using twice annual or seasonal standardized surveys (timed presence/absence sampling and 20-cm diameter plot sampling for habitat association data). Standardized surveys follow the methods described in Sorensen 2011.
- Document impacts to this species and its habitat.

Create, Restore, or Enhance Habitat and Nature Processes - Invasive Species Control – Plant – Mechanical

- Remove invasive plants (such as poison ivy, tamarisk, camelthorn, Ravenna grass, etc) from ambersnail habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for ambersnails. Invasive species control is a minor aspect of the overall survey effort for this species.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on the species and its habitat.

LOCATION

Coconino County, Arizona.

TIMELINE

Annually – spring, summer, and fall.

BUDGET

\$5,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department’s statewide 10(a)(1)(A) permit.

SUB-PROJECT 5. TALUSSNAILS AND MOUNTAINSNAILS

NEED

The San Xavier Talussnail Conservation Agreement and the draft Pinaleño Landsnail Conservation Agreement (which includes the Wet Canyon talussnail), require annual monitoring of extant populations of these landsnails. We will assist landowners with

these surveys and document species habitat preferences and environmental conditions. As workload, funding, and landowner access allow, we will also inventory the status and distribution of other talussnails (genus *Sonorella*) and mountainsnails (genus *Oreohelix*). The San Xavier talussnail (*Sonorella eremita*), Wet Canyon talussnail (*S. macrophallus*), and Rosemont talussnail (*S. rosemontensis*) are identified in Arizona's SWAP as SGCN tier 1A. Other talussnails, like Phoenix talussnail (*S. allynsmithi* [formerly called Squaw Peak talussnail, *Maricopella allynsmithi*]), Papago talussnail (*S. papagorum*), Pinaleño talussnail (*S. grahamensis*), Mimic talussnail (*S. imitator*), Clark Peak talussnail (*S. christenseni*) and the Pinaleño mountainsnail (*Oreohelix grahamensis*) are identified as SGCN tier 1B; 57 other talussnails and 8 other mountainsnails are SGCN tier 1C. The Arizona SWAP identifies talussnail and mountainsnail monitoring and management as a priority action (p.115).

OBJECTIVES

- Monitor extant populations of landsnails covered under both agreements, and document habitat conditions with repeat digital photos and weather data when available.
- Inventory and document current status and distribution of talussnails and mountainsnails, and assess threats to their populations.
- Train partners to survey and monitor the species.

EXPECTED RESULTS AND BENEFITS

- Annual monitoring of these mollusks will meet the conservation agreement commitments to assess the species current status and distribution.
- Documenting range expansions or new meta-populations of these species may help preclude the need to list these species under the ESA.

APPROACH

Planning-Species and Habitat Management Planning-Habitat Conservation Plan Development

- Finalize the draft Pinaleño Landsnail Conservation Agreement prior to October 2014.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update talussnail databases for species surveyed.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

Among the talussnails and mountainsnails, the following species are prioritized for surveys under this sub-project: San Xavier talussnail (*Sonorella eremita*), Wet Canyon talussnail (*S. macrophallus*), Rosemont talussnail (*S. rosemontensis*), Sonoran talussnail (*S. magdalenensis*), Phoenix talussnail (*S. allynsmithi*), Pinaleño talussnail (*S. grahamensis*), Mimic talussnail (*S. imitator*), Clark Peak talussnail (*S. christenseni*), and Pinaleño mountainsnail (*Oreohelix grahamensis*).

- Survey extant populations and historical localities for these mollusks as needed to determine status or identify conservation opportunities.
- Collect a limited number of specimens from historical and newly identified locations for taxonomic analysis, genetics, and research.
- Support cooperators in surveys of potential habitat and historic locations of these mollusks, and in furthering our understanding of their taxonomy and genetics.
- Document impacts to these mollusk populations and their habitat.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on the species of talussnails and mountainsnails and their habitat.

LOCATION

Pima County (for San Xavier, Rosemont, and Sonoran talussnails),
Graham County (for Wet Canyon, Pinaleño, Mimic, and Clark Peak talussnails and Pinaleño mountainsnail),
Maricopa County (for Phoenix talussnail), Arizona.

TIMELINE

Annually – spring, summer, and fall.

BUDGET

\$5,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement

PROJECT 3: NATIVE FISH CONSERVATION AND RECOVERY TOTAL = \$175,000

Principle Investigator – Jeff Sorensen

SUB-PROJECT 1. COMMUNITY SURVEYS AND RESEARCH NEEDS FOR SGCN FISHES

NEED

Nearly all native fish species in Arizona are identified as SGCN (Tier 1A/1B) in the Arizona SWAP. Apache trout, Gila trout, Little Colorado spinedace, Yaqui catfish, beautiful shiner, and Sonora chub are also ESA-listed as threatened; Yaqui chub is ESA-listed as endangered. The Arizona SWAP identifies monitoring and management of SGCN fishes as priority actions (pp.116-119). Implementation of conservation and recovery actions for SGCN fishes in coordination and cooperation with agency partners and USFWS species leads is also needed. Additional information about these fish populations is necessary to inform future management strategies and help determine and prioritize research needs. Community surveys are proposed to track status and trends of populations of SGCN fishes, including the monitoring of unknown status species.

OBJECTIVES

- Continue annual or seasonal monitoring of known populations of SGCN fishes.
- Conduct surveys of other sites to find previously unknown populations or suitable habitat for reintroduction efforts.
- Establish new wild or refuge populations of SGCN fishes.
- Remove or reduce threats to improve habitat for reintroduction or for extant populations.

EXPECTED RESULTS AND BENEFITS

- Current data on the status and distribution of SGCN fishes and their habitat will allow managers to plan for or react to changes in land management, develop prescriptions for dealing with non-native species, identify research needs, and assess the need for refuge populations and/or habitat improvements.
- Recent data on SGCN fishes will be used to update 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, to develop or revise recovery plans and/or conservation agreements, and drafting progress reports.
- New wild or refuge populations of SGCN fishes will expand their range and help safeguard them from threats of extirpation or extinction.
- Removal or reduction of threats to these species will help secure their habitat, as well as improve species recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing 5-year status reviews of listed SGCN fishes, and candidate notice of reviews for candidate SGCN fishes.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats - Fish and Wildlife Species

Among the SGCN fishes, the following species are prioritized for surveys under this sub-project: Apache trout, Gila trout, Little Colorado spinedace, Virgin spinedace, Sonora sucker, desert sucker, flannelmouth sucker, bluehead sucker, Little Colorado River sucker, speckled dace, longfin dace, Mexican stoneroller, Yaqui chub, Yaqui sucker, Yaqui catfish, beautiful shiner, and Sonora chub.

- Survey extant populations, historic localities, or other sites as needed for SGCN fishes using standardized sampling protocols to determine status or to identify conservation opportunities.

- Collect up to 30 voucher specimens for newly discovered populations or per site (dependent on numbers caught or observed) for additional genetic/taxonomic analyses, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if natives are limited in number).
- Monitor extant and reintroduced populations of SGCN fishes as needed to determine status and evaluate establishment success.

Species Reintroduction and Stocking – Native Species Restoration – Translocation (see Appendix for approved, relevant EACs)

- Among the SGCN fishes, the following species are prioritized for reintroductions under this sub-project: Apache trout, Gila trout, Little Colorado spinedace, Virgin spinedace, Sonora sucker, desert sucker, flannelmouth sucker, bluehead sucker, Little Colorado River sucker, speckled dace, longfin dace, Mexican stoneroller, Yaqui chub, Yaqui sucker, Yaqui catfish, beautiful shiner, and Sonora chub.
- In coordination with the USFWS species lead and landowners, collect and translocate an appropriate number of founding stock (typically 200 or more) from approved host population to the reintroduction site.
 - Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.
- Assess distribution and status of invasive exotic animals in wildlife habitats and remove or reduce these exotic animals when captured in targeted collection efforts (some examples: trapping for crayfish, bullfrogs, green sunfish, and mosquitofish).

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Plant – Mechanical

- Remove invasive plants from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for SGCN fishes. Invasive species control is a minor aspect of the overall survey effort for this species. Removal efforts include mechanical means—cutting, pulling, clipping, or raking out overgrown aquatic vegetation to increase open water habitat.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Year-round.

BUDGET

\$6,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.
- Special rule under section 4(d) of the Act.

SUB-PROJECT 2. ROUNDTAIL, HEADWATER, AND GILA CHUB

NEED

Roundtail chub and headwater chub are candidates for ESA listing while Gila chub is ESA listed as endangered (and all are identified under Arizona's SWAP as SGCN tier 1A species). Conservation and recovery of these species requires additional populations, secure from threats like non-native fishes, crayfish and bullfrogs, habitat degradation and loss by livestock overgrazing, trampling, and irresponsible off-highway vehicle use, loss of instream flow, and groundwater use. The Arizona SWAP identifies roundtail, headwater, and Gila chub monitoring and management as priority actions (p.119 and 116, respectively). Conservation needs for roundtail chub are also identified in the Three Species Rangewide Conservation Agreement and Arizona's Statewide Conservation Agreement and Strategy for six species of suckers and chubs (the latter, includes headwater chub).

OBJECTIVES

- Determine status and reintroduction success of extant and reintroduced populations through monitoring.
- Survey streams to better define the distribution of chub species.
- Collect tissue samples from various chub locations to further investigate the genetic/taxonomic identity of roundtail, headwater, and Gila chub populations.
- Establish new wild and captive populations of roundtail and headwater chubs under the Statewide Conservation Agreement and Strategy (SCAS) and/or Rangewide Agreement in suitable habitat within their historic range.
- Establish new populations of Gila chub in suitable habitat within their historic range.
- Remove or reduce threats to improve habitat for reintroduction or for extant populations. These actions are identified under the SCAS and Rangewide Agreement as necessary to further the conservation of roundtail and headwater chubs.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Successful establishment of additional populations of roundtail and headwater chubs will help conserve these species over the long-term, and may preclude the need to list these species under the ESA.

- Successful establishment of additional populations of Gila chub will help recover the species. Note: Recovery targets for Gila chub have not been established yet, since the species recovery plan is in its initial stages of planning and development.
- Removal or reduction of threats to these species will help secure their habitat, as well as improve species recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing candidate notice of reviews for roundtail and headwater chub.

Planning-Species and Habitat Management Planning-Listed Species Recovery Planning

- Assist the USFWS in developing a recovery plan for the Gila chub.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.
- In cooperation with the Three Species Rangewide Conservation Agreement partners, assist in updating and maintaining the Rangewide database (for roundtail chub, flannelmouth sucker, bluehead sucker).

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Monitor wild, captive, and reintroduced populations of roundtail and headwater chubs under the SCAS and Rangewide agreements to determine their status and evaluate reintroduction success. Monitoring methods include: seining, experimental gill netting, use of hoop nets and minnow traps, dipnetting, backpack electrofishing, visual counts with snorkeling, and angling.
- Monitor wild and reintroduced Gila chub populations to determine their status and evaluate reintroduction success. Monitoring methods are the same described above.
- Collect a limited number of specimens (up to 30 per site, or fin-clipped tissue samples if chubs are limited in number) from historical and newly identified locations for taxonomic analysis, genetics, and research, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if chubs are limited in number).
- Document impacts to wild chub populations and their habitat.

Species Reintroduction and Stocking - Native Species Restoration - Propagation and Stocking (see Appendix for list of approved relevant EACs).

- Collections of juvenile and/or mature chubs from host populations or progeny from captive stocks will be translocated to approved stocking sites identified under the

SCAS and Rangewide agreements, the Gila River Basin Native Fishes Conservation Program task list for Arizona (for Gila chub), and Department wildlife area and/or watershed management plans.

- Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Year-round.

BUDGET

\$64,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department’s statewide 10(a)(1)(A) permit.

SUB-PROJECT 3. BIG RIVER NATIVE FISHES

NEED

Humpback chub, bonytail, razorback sucker, and Colorado pikeminnow are all ESA listed as endangered (and all are identified under Arizona’s SWAP as SGCN tier 1A species). Recovery of these “big river natives” requires additional populations, secure from threats like competition and predation by non-native fishes, habitat degradation and loss by modified instream flows, and loss of habitat connectivity. The Arizona SWAP identifies big river native fishes monitoring and management as priority actions (p.118). The Glen Canyon Dam Adaptive Management Program, Lower Colorado River Multi-Species Conservation Plan, and Gila River Basin Native Fishes Conservation Program also have identified recovery actions for big river native fishes.

OBJECTIVES

- To monitor and maintain populations of big river native fishes within their historic range.
- To establish new populations of humpback chub, bonytail, and razorback sucker in suitable habitat within their historic range.
- Remove or reduce threats to improve habitat for reintroduction or for extant populations.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Successful establishment of additional populations of big river native fishes will help recover these species and prevent their extirpation or extinction.
- Reduced competition and predation by non-natives—using mechanical removal efforts in the Colorado and Verde rivers and tributaries—may improve big river native fishes recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing 5-year status reviews of these fishes.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Monitor big river native fishes as needed to determine status and evaluate reintroduction success.
- Collect a limited number of specimens (up to 30 per site, or fin-clipped tissue samples if numbers of the target species are limited at the site) from historical and newly identified locations for taxonomic analysis, genetics, and research, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if chubs or suckers are limited in number).
- Document impacts to wild big river native fish populations and their habitat.

Species Reintroduction and Stocking - Native Species Restoration - Propagation and Stocking

- Stock juvenile and/or mature suckers and chubs from host populations or progeny from captive stocks will be translocated to approved stocking sites in coordination with USFWS species leads and landowners.
- Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

LOCATION

Statewide within the Gila River Basin and the lower Colorado River drainage of Arizona, including the Colorado River and tributaries in Grand Canyon, Fossil Creek, the mainstem of the Verde, Salt, and Gila rivers, Lake Mead, Lake Mohave, Lake Havasu, the Bill Williams drainage, the lower Colorado River and off-channel habitats down to the international border with Mexico, Stillman Lake, Horseshoe Lake, Bartlett Lake, Tempe Town Lake, and refuge ponds statewide.

TIMELINE

Annually – Year-round.

BUDGET

\$6,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.
- 10(j) population.

SUB-PROJECT 4. TOPMINNOW AND PUPFISH

NEED

The Gila and Yaqui topminnows (both species listed under the ESA as Sonoran topminnow), desert pupfish and Sonoyta (Quitobaquito) pupfish are all ESA-listed endangered fishes (and all are SGCN tier 1A species). Historically, the Gila topminnow was the most common fish in the Gila River Basin, but has now been reduced to eight extant wild sites and several dozen reestablished wild and captive sites. Wild natural populations of desert pupfish no longer exist in Arizona, but still occur in California and México, with reestablished wild and captive sites in both Arizona and California. In the USA, most Yaqui topminnow and Sonoyta pupfish populations are restricted to a few extant or reestablished wild sites and captive refuge populations. In Sonora, the Sonoyta pupfish is critically threatened in the wild due to dewatering of habitat, and is being maintained in several captive sites. Arizona Game and Fish Department has advised and assisted monitoring and management activities for the species in cooperation with USFWS species lead and biologists in México, and assisted in the establishment, maintenance and monitoring of a number of refuge populations. Recovery of these species requires additional work and continued support, cooperation and coordination among partners for the establishment of additional refuge populations, the reduction or removal of threats posed by non-native aquatic species, and reversal of remaining habitat

degradation and loss. The Arizona SWAP identifies topminnow and pupfish monitoring and management as a priority action (p.117). Recovery goals for these species are identified in their respective recovery plans.

OBJECTIVES

- To monitor and maintain populations of topminnow and pupfish within their historic range.
- To establish new populations of these species in suitable habitat within their historic range; use SHAs for non-federal landowners when appropriate.
- Remove or reduce threats to improve habitat for reintroductions and for extant populations.
- Train partners to survey and monitor the species and their habitat.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Successful establishment of additional populations of these species will reduce their risk of extinction, help secure their recovery over the long-term, and eventually allow their down-listing or de-listing under the ESA.
- Removal or reduction of threats to these species will help secure their habitat, as well as improve species recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing 5-year status reviews of these fishes.

Planning-Species and Habitat Management Planning-Listed Species Recovery Planning

- Assist the USFWS in revising the recovery plan for the Gila topminnow.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.
- Develop and maintain a topminnow-pupfish Safe Harbor Agreement database.

Data Collection and Analysis - Research, Survey or Monitoring Populations and Habitats – Fish and Wildlife Species

- Survey extant and reintroduced populations, and historic localities, for topminnows and desert pupfish and Sonoyta (Quitobaquito) pupfish to determine status.
- Evaluate suitability of potential sites for topminnow and pupfish reintroductions, and identify conservation opportunities.

- Document impacts to wild and refuge populations and their habitat.

Species Reintroduction and Stocking - Native Species Restoration - Translocation. (see Appendix for list of approved topminnow and pupfish EACs).

- Collection, transport and stocking of topminnow and pupfish from appropriate populations (wild or captive) to appropriate sites for the establishment of new populations.
- Collect a limited number of specimens (up to 30 per site, or fin-clipped tissue samples if numbers of the target species are limited at the site) from historical and newly identified locations for taxonomic analysis, genetics, and research, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if topminnow or pupfish are limited in number).
- Establish Safe Harbor Agreement-enrolled populations of topminnow and/or pupfish on participating non-federal lands.
- Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Note: We may choose to stock limited numbers of captive-raised topminnow and/or pupfish into small suitable sites or public-viewed aquariums for the purposes of increasing public awareness of endangered fishes and/or the use of native fishes for effective mosquito vector control. These small populations would not count as recovery sites, nor would fish from these populations be used to stock larger sites that support recovery goals. The level of monitoring and management of these small populations will be minimal so that we may focus more of our workload on higher priority sites and actions that count toward recovery of the species. Public-viewed aquariums with these fishes will have printed outreach materials on display to inform the public about topminnow and/or pupfish life history, threats, habitat needs, status, and recovery needs.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Plant – Mechanical

- Remove invasive plants from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for SGCN fishes. Invasive species control is a minor aspect of the overall survey effort for these species. Removal efforts include mechanical means—cutting, pulling, clipping, or raking out overgrown aquatic vegetation to increase open water habitat.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who may conduct surveys and monitoring on these species and their habitat.

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department’s statewide 10(a)(1)(A) permit.

LOCATIONS

Statewide within the Gila River Basin, the lower Colorado River drainage of Arizona, California, Sonora and Baja California; drainages of the Rio Yaqui, San Pedro River, Santa Cruz River and Rio Sonoyta in Arizona and México.

TIMELINE

Annually – Year-round.

BUDGET

\$64,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department’s statewide 10(a)(1)(A) permit.

SUB-PROJECT 5. LOACH MINNOW AND SPIKEDACE

NEED

The loach minnow and spikedace are both ESA-listed endangered fishes (and both are SGCN tier 1A species). In Arizona and New Mexico, these species are restricted to a few extant (8 loach minnow populations and 5 spikedace populations) or reestablished wild sites and select lineages of both species are maintained in captive refuge populations at the Bubbling Ponds Native Fish Conservation Facility. Recovery of these species requires continued support, cooperation and coordination among partners for the recruitment and development of additional populations, secure from threats posed by non-native aquatic species, and habitat degradation and loss. The Arizona SWAP identifies loach minnow and spikedace monitoring and management as a priority action (p.116).

OBJECTIVES

- To monitor and maintain populations of loach minnow and spikedace within their historic range.
- To establish new populations of these species in suitable habitat within their historic range.
- Remove or reduce threats to improve habitat for reintroductions and for extant populations.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Successful establishment of additional populations of these species will reduce their risk of extinction, help secure their recovery over the long-term, and eventually allow their de-listing under the ESA.
- Removal or reduction of threats to these species will help secure their habitat, as well as improve species recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.

Data Collection and Analysis - Research, Survey or Monitoring Populations and Habitats – Fish and Wildlife Species

- Survey extant and reintroduced populations, historic localities, or other potential sites for loach minnow and spikedace to determine status, evaluate establishment success, and to identify conservation opportunities.
- Document impacts to wild and refuge populations and their habitat.

Species Reintroduction and Stocking - Native Species Restoration - Translocation. (see Appendix for list of approved loach minnow and spikedace EACs).

- Collections of juvenile and/or mature loach minnow and/or spikedace from host populations or progeny from captive stocks will be translocated to approved stocking sites.
- Collect a limited number of specimens (up to 30 per site, or fin-clipped tissue samples if numbers of the target species are limited at the site) from historical and newly identified locations for taxonomic analysis, genetics, and research, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if loach minnow or spikedace are limited in number).
- Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Nature Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive

species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

LOCATIONS

Arizona, Statewide within the Gila River Basin

TIMELINE

Annually – Year-round.

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.

SUB-PROJECT 6. LITTLE COLORADO SPINEDACE

NEED

The Little Colorado (LC) spinedace is an ESA-listed threatened fish (and SGCN tier 1A species). In Arizona, LC spinedace are currently found in the East Clear Creek watershed, Chevelon Creek, the upper Little Colorado River, and up until 1997 in Silver Creek. Recovery of this rare fish requires continued support, cooperation and coordination among partners for the recruitment and development of additional populations, secure from threats posed by non-native aquatic species, and habitat degradation and loss. The Arizona SWAP identifies LC spinedace monitoring and management as a priority action (p.116).

OBJECTIVES

- To monitor and maintain populations of LC spinedace within their historic range.
- To establish new populations of this species in suitable habitat within their historic range.
- Remove or reduce threats to improve habitat for reintroductions and for extant populations.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and translocated populations will better inform resource managers and appropriately address species and habitat needs.
- Successful establishment of additional populations of this species will reduce their risk of extinction, help secure their recovery over the long-term, and eventually allow their de-listing under the ESA.
- Removal or reduction of threats to this species will help secure their habitat, as well as improve species recruitment and population growth.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for this species with USFWS and other agency partners.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for new records on this species.

Data Collection and Analysis - Research, Survey or Monitoring Populations and Habitats – Fish and Wildlife Species

- Survey extant and reintroduced populations, historic localities, or other potential sites for LC spinedace to determine status, evaluate establishment success, and to identify conservation opportunities.
- Document impacts to wild and refuge populations and their habitat.

Species Reintroduction and Stocking - Native Species Restoration - Translocation. (see Appendix for list of approved LC spinedace EACs).

- Collections of juvenile and/or mature LC spinedace from host populations or progeny from captive stocks will be translocated to approved stocking sites.
- In coordination with the USFWS species lead, conduct emergency salvages of LC spinedace from drainages and sites threatened by dewatering due to drought, or catastrophic loss by wildfire or post-wildfire ash and sediment flows, . Hold salvaged fish in secured captive facilities (may be longer than 45 days in duration), or stock salvaged fish in suitable refuge ponds.
- Collect a limited number of specimens (up to 30 per site, or fin-clipped tissue samples if numbers of the target species are limited at the site) from historical and newly identified locations for taxonomic analysis, genetics, and research, and up to 120 voucher specimens per site for disease testing (other species may be used as surrogates if LC spinedace are limited in number).
- Periodically augment reintroduced populations and refuge populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Nature Processes – Create New Habitat or Natural Processes

- Creation of new habitat or natural processes for the benefit of fish and wildlife and recreational users. Specifically, develop new or improve existing habitat for refuge populations of the species (example: improvements to Middle Wallace Tank at the Raymond Wildlife Area).

Create, Restore, or Enhance Habitat and Nature Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during

routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

LOCATIONS

Coconino, Navajo, and Apache counties (for wild, refuge, and reintroduced populations), Yavapai County, Arizona (if Bubbling Ponds Fish Hatchery is used as a holding site)

TIMELINE

Annually – Year-round.

BUDGET

\$20,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.

SUB-PROJECT 7. VIRGIN RIVER FISHES

NEED

Arizona is one of the multi-state partners that monitor and manage the native fishes of the Virgin River in northwestern Arizona. The Utah-led Upper Virgin River Program and Recovery Team has conducted most of the twice-annual monitoring of this system, and is systematically using chemical treatments throughout the watershed to remove nonnative, invasive fish. A rotenone treatment is needed to eliminate nonnative, invasive fish (including red shiner) from the Stateline Barrier, in Utah, down to the Virgin River Gorge Barrier, in Arizona, to provide a buffer zone for the upstream river reaches to ensure the future of native fish within the Virgin River (most of which are identified in Arizona's SWAP as SGCN [Tier 1A/1B]). It is thought that the annual flow reduction during summer months, coupled with construction of the Gorge Barrier in 2009, will prevent nonnative, invasive fish from reinvading upstream reaches. Due to the competitiveness of the red shiner and the dramatic declines in the populations of native fish, it is strongly believed that the endangered woundfin would not persist in the Virgin River in the continued presence of red shiner. Therefore, removing red shiner from the Gorge provides the best protection for upstream reaches and overall native fish community. Elimination of red shiner from the Virgin River is a priority action in the Virgin River Fishes Recovery Plan (USFWS 1995). The Arizona SWAP identifies Virgin River fishes monitoring and management as a priority action (p.117).

OBJECTIVES

- Monitor and maintain populations of Virgin River native fishes within their historic range.
- Chemical renovation of the Virgin River Gorge provides the highest likelihood of successfully removing the threat of nonnative, invasive fish (including red shiner).

- Prior to the renovation, native fishes in the treatment reach will be salvaged, held, and/or moved upstream.
- Establish another population of woundfin outside of the Virgin River drainage (Hassayampa River) within the species historic range.

EXPECTED RESULTS AND BENEFITS

- Continued monitoring of extant and hatchery-stocked populations of Virgin River fishes will better inform resource managers and appropriately address species and habitat mitigation needs for the Lower Virgin River Program.
- A successful renovation of the Virgin River between the Stateline Barrier and the Virgin River Gorge Barrier may help to improve numbers and survivability of native fish with the reduction of non-native, invasive fish (including red shiner).
- Establishment of woundfin in the Hassayampa River will help safeguard the species should a catastrophic event impact the Virgin River population of woundfin.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Native Fish Database for species surveyed.

Data Collection and Analysis - Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations of endemic Virgin River fish to determine status or identify conservation opportunities.

Species Reintroduction and Stocking - Native Species Restoration – Translocation [actually Salvage]. All planning activities, required NEPA documents, and field activities will be carried out by Utah Division of Wildlife personnel with oversight by AGFD licensed pesticide applicators and fisheries staff. Per the USFWS species lead, the salvage, holding, and transport of ESA-listed fishes will be covered under USFWS permit and the final environmental assessment that was completed November 2010 (VirginRiverRotenone_EA-BA10192010_final_508), and associated biological opinion and FONSI.

- Salvage extant populations of endemic Virgin River fish to be held or moved outside the treatment reach during chemical renovation.
- Reintroduce held or translocated endemic Virgin River fishes following chemical treatment is completed.
- Periodically augment reintroduced populations with additional fish from appropriate stocks to maintain genetic fitness and variability.

Species Reintroduction and Stocking - Native Species Restoration – Translocation.

- Reintroduce captive-raised, 10(j) status woundfin into the Hassayampa River (a previously approved reintroduction stream within the species historic range).
- Periodically augment the reintroduced population with additional fish from appropriate stocks to maintain genetic fitness and variability.

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Chemical. All planning activities, required NEPA documents, and field activities will be carried out by Utah Division of Wildlife personnel with oversight by AGFD licensed pesticide applicators and fisheries staff. Per the USFWS species lead, the salvage, holding, and transport of ESA-listed fishes will be covered under USFWS permit and the final environmental assessment completed November 2010, and associated biological opinion and FONSI.

- Control of invasive exotic species using rotenone within the 17-mile treatment reach between the Stateline Barrier and Virgin Gorge Barrier. Reinvansion by red shiners or other invasive exotic fishes into the treatment reach may require additional salvages and rotenone treatments.

LOCATION

Virgin River in Coconino County,
Hassayampa River in Yavapai County, Arizona.

TIMELINE

Annually – Year-round.

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.
- 10(j) population.

SUB-PROJECT 8. HATCHERY PROPAGATION AND REARING

NEED

Arizona has 35 species of native fishes, with nearly all identified in the Arizona SWAP as SGCN (tier 1A and 1B). Among the native fishes in Arizona, 20 are ESA-listed endangered or threatened, and four as candidates for listing. Many of the native fishes are limited in their distribution and abundance. Native fishes are at risk from numerous threats such as: loss or degradation of habitat, groundwater use, loss of instream flow, overgrazing by livestock, catastrophic wildfires, and invasive or nuisance species. Conservation and recovery of SGCN fishes requires additional populations. Hatchery propagation and rearing provide the necessary stocks of fish needed to help establish new

populations in the wild and additional captive refuge populations. The Arizona SWAP identifies hatchery propagation and rearing of SGCN fishes as priority actions (p.116-119).

OBJECTIVES

- To maintain broodstocks of loach minnow, spikedace, roundtail chub, Gila topminnow, desert pupfish, Gila chub, woundfin, Virgin River chub, and other SGCN fishes.
- Rear young humpback chub and razorback sucker for future stocking efforts with interagency partners.
- Investigate aids to propagation, disease treatment, and conditioning techniques for captive fishes to improve numbers and survivability of fish to be stocked into the wild.

EXPECTED RESULTS AND BENEFITS

- Successful establishment of additional populations of these species will help recover these species over the long-term, and eventually allow ESA down-listing or de-listing of these species.
- Successful establishment of additional populations of roundtail chubs and other SGCN fishes will help conserve these species over the long-term, and may preclude the need to list these species under the ESA.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing 5-year status reviews of listed SGCN fishes, and candidate notice of reviews for candidate SGCN fishes.

Species Reintroduction and Stocking - Native Species Restoration – Propagation and Stocking (see Appendix for list of approved relevant EACs).

- Collect, propagate, and rear native fish to augment, supplement or introduce extirpated native fish populations.
- Investigate aids to propagation, disease treatment, and conditioning techniques for captive fishes (identified above under Objectives) to improve numbers and survivability of fish to be stocked into the wild. See the following for research specifics:
 - Conduct controlled experimental tests on captive fish to: improve stream flow conditioning prior to repatriation, nonnative predator avoidance conditioning, understanding species spawning conditions and environmental cues, improving propagation techniques, identify techniques for improving growth, and improving disease/pathogen treatment and quarantine methods.

- Stream flow conditioning methods include the use of raceways with variable flows and structure to mimic natural conditions to improve fish stamina/health post-stocking. These methods are not likely to cause any mortality or injury to fishes, based on previous research and stocking success.
- Nonnative predator avoidance conditioning methods include the use of holding tanks and raceways with variable structure and substrate, along with presence of nonnative predators to improve survivability in the wild post-stocking. In avoidance conditioning, some fish may be injured or killed in this process, however these tests will use surplus captive-raised fish, and will not put any listed fish species at jeopardy.
- Species spawning research/improving propagation techniques and growth methods include the use of holding tanks and raceways with variable flows, structure, and substrates to mimic natural conditions suitable for successful reproduction and recruitment per species. Water temperature, flow discharge and duration, photoperiod, food, and hormones may be used as additional variables in these tests. These methods are not likely to cause any mortality or injury to fishes, based on previous research and propagation success.
- New research on disease/pathogen treatment and quarantine methods include the use of various chemical solutions and antibiotics in holding tanks and raceways with captive fish over various concentrations, combinations, durations, temperatures, etc. In testing new methods and products, some fish may be injured or killed in determining threshold tolerances and combinations of treatments; however, these tests will use surplus captive-raised fish, and will not put any listed fish species at jeopardy.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Year-round.

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.
- 10(j) population.
- Special rule under section 4(d) of the Act.

SUB-PROJECT 9. NATIVE AQUATIC CONSERVATION TO COMPLEMENT SRP HCP WORK

NEED

Thirteen native aquatic SGCN (Gila topminnow, loach minnow, spikedace, Colorado pikeminnow, razorback sucker, Sonora sucker, desert sucker, speckled dace, longfin

dace, lowland leopard frog, Mexican gartersnake, and narrow-headed gartersnake) occupy the Verde River from Pecks Lake to the Lower Salt River. The Arizona SWAP identifies monitoring and management of each of these SGCN in this sub-project as priority actions (pp.116-119, 124, 126-127, and 155).

OBJECTIVES

- Continue annual or seasonal monitoring of known populations of SGCN aquatic species in the project area.
- Conduct surveys of other sites to find previously unknown populations or suitable habitat for reintroduction efforts.

EXPECTED RESULTS AND BENEFITS

- Current data on the status and distribution of SGCN fishes and their habitat will allow managers to plan for or react to changes in land management, develop prescriptions for dealing with non-native species, identify research needs, and assess the need for refuge populations and/or habitat improvements.
- Recent data on SGCN fishes will be used to update 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, to develop or revise recovery plans and/or conservation agreements, and drafting progress reports.
- Successful establishment of additional populations of these species will help recover these species over the long-term, and eventually allow ESA down-listing or de-listing of listed species, or preclude the need to list candidate species.
- Successful establishment of additional populations of roundtail chubs and other SGCN aquatic species will help conserve these species over the long-term, and may preclude the need to list these species under the ESA.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and communicate survey and management needs for these species with USFWS and other agency partners.
- Provide technical support and expertise to the USFWS in completing 5-year status reviews of listed SGCN fishes, and candidate notice of reviews for candidate SGCN fishes.

Data Collection and Analysis - Research, Survey or Monitoring – Populations and Habitats – Fish and Wildlife Species

- Among the SGCN fishes, the following species are prioritized for surveys under this sub-project: Gila topminnow, loach minnow, spikedace, Colorado pikeminnow, razorback sucker, Sonora sucker, desert sucker, speckled dace, longfin dace, and roundtail chub.
- Monitor the fishery in the Verde River from Childs to Sheeps Bridge, using boat electrofishing, seining, minnow traps, and angling.
 - Assist Region III with monitoring the Verde River fish community

- Monitor native fish community in Lime Creek annually, using backpack electrofishing, seining, minnow traps, dipnetting, and visual surveys while snorkeling.
- Monitor other sections of the Verde River (i.e. below Sheeps Bridge to Horseshoe Lake, between Horseshoe Dam and Bartlett Lake, below Bartlett Lake to the confluence with Salt River, and the lower Salt River between the Verde River confluence and Granite Reef Dam) to assess movements, distribution, and status of SGCN taxa and their threats. Monitoring methods include: boat electrofishing, gill-netting, trammel netting, hoop nets, minnow traps, seining, and angling.

Species Reintroduction and Stocking - Native Species Restoration – Propagation and Stocking

- Assist Bubbling Ponds Fish Hatchery in native aquatic species propagation. This includes annual draw downs, tagging efforts, and stockings

Create, Restore, or Enhance Habitat and Natural Processes - Invasive Species Control – Animal – Mechanical

- Remove invasive exotic animals (e.g. undesirable nonnative fish, bullfrogs, crayfish) from wildlife habitats as needed for conservation and restoration efforts, during routine survey and monitoring efforts for these fishes. Removal efforts of invasive species is a minor part of the overall survey effort for these fishes, and exotics are incidentally caught in the sampling.

LOCATION

The HCP encompasses the following Action Area:

- The Salt River and 100-year floodplain between Granite Reef Dam and the confluence with the Verde River;
- The Verde River and the 100-year floodplain between the confluence with the Salt River and the upper end of Horseshoe Lake at full pool;
- The Verde River between the upper end of Horseshoe Lake at full pool and the Allen Ditch Diversion near Peck's Lake
- The lower 0.125 miles of all intermittent and ephemeral streams and washes tributary to the reaches listed above;
- The lower 6 stream miles of Lime Creek, the lower 8 stream miles of the East Verde River, the lower 3 stream miles of Fossil Creek, the lower 2 stream miles of West Clear Creek, the lower 12 stream miles of Wet Beaver Creek, the lower 3 stream miles of Oak Creek.

TIMELINE

Annually – spring, summer and fall.

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.
- Exempt in accordance with the provisions of §§17.31 and 17.44 Special Rules-fishes.
- 10(j) population.

PROJECT 4: AMPHIBIAN CONSERVATION AND RECOVERY TOTAL = \$200,000

Principal Investigator -- Thomas R. Jones

SUB-PROJECT 1. CHIRICAHUA LEOPARD FROG

NEED

The Chiricahua leopard frog was listed in 2002 as threatened under the ESA and is a Tier 1A species in the Arizona SWAP. The Department is the lead or co-lead for the Chiricahua Leopard Frog Recovery Team, two Chiricahua leopard frog recovery steering committees and several local recovery groups. We staff, organize, and lead meetings and work with partners to develop and implement work plans, etc., and document progress in meeting Recovery Goals and achieving de-listing criteria. All activities outlined below can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP, or in the Chiricahua Leopard Frog Recovery Plan. The Recovery Plan requires the establishment of at least two metapopulations, and one isolated and robust population in each of seven Arizona recovery units (RU) which are defined by geography, hydrography, land management and ownership, and threats. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 121-122) identified in the Arizona SWAP.

OBJECTIVES

The objectives and following actions are designed to contribute to meeting the following recovery criteria identified in the Chiricahua Leopard Frog Recovery Plan:

- Survey and monitor Chiricahua leopard frog sites in each RU in Arizona.
- Train partners to survey and monitor.
- Augment existing and establish new populations of Chiricahua leopard frogs.
- Improve and manage aquatic breeding habitats.
- Reduce or eliminate threats (e.g., invasive aquatics) for long-term management in each RU in which we work.

EXPECTED RESULTS AND BENEFITS

- Implementation of recovery actions should result in delisting of Chiricahua leopard frogs.
- Recovery actions and eventual recovery of Chiricahua leopard frogs will contribute directly to recovery of other native aquatic wildlife (e.g., northern Mexican gartersnake) and conservation of associated aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and meet with the Chiricahua Leopard Frog Recovery Team, steering committees, and local recovery groups to develop the recovery infrastructure and activities needed to attain the objectives outlined in the Chiricahua leopard frog Recovery Plan. Partners include USFWS, USFS, USGS, BLM, Arizona State Land Department, New Mexico Department of Game and Fish, The Phoenix Zoo, ASDM, University of Arizona, Arizona State University, TNC, Sky Island Alliance, grazing permittees, and private citizens.

Planning-Species and Habitat Planning-Habitat Conservation Plan Development

- Engage landowners to enroll high priority properties in the Safe Harbor Agreement (SHA) for Chiricahua leopard frogs (includes site evaluation)

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.
- Maintain and update the Chiricahua leopard frog Safe Harbor Agreement database.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Provide professional training to individuals who will conduct certified surveys for Chiricahua leopard frogs.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Monitor actively managed recovery areas to determine status and evaluate success.
- Survey sites to identify recovery opportunities, threats, and new Chiricahua leopard frog populations. (Only individuals who are permitted by USFWS or the Department will conduct survey and monitoring activities.)
- Collect skin swabs for PCR to detect chytrid fungus. Skin swabs will be collected from animals in the wild and in captive populations.
- Collect toe tips or other tissues to contribute to genetic analyses, including a rangewide phylogeographic analysis of the Chiricahua leopard frog.

Data Collection and Analysis: Techniques development (AGFD Statewide Terrestrial Survey/Inventory – Game Management

- Conduct and test the effectiveness of Chiricahua leopard frog play-back call surveys above and below water to increase effectiveness of field surveys.

Species Re-introduction and Stocking: Native species restoration

- Establish new and maintain existing captive facilities to breed, rear or headstart Chiricahua leopard frogs.
- Establish or augment Chiricahua leopard frog populations at one or more sites. This process includes site selection, evaluation, and site renovation as needed; along with collection, propagation and release of frogs, eggs or tadpoles.
- Establish Safe Harbor populations when deemed appropriate.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$176,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 2. TARAHUMARA FROG

NEED

Tarahumara frogs is a Tier 1A species in the Arizona SWAP. They were extirpated from Arizona in the late 1970s and early 1980s. The Department developed the Tarahumara Frog 12-Step Reestablishment Proposal, and reintroduced Tarahumara frogs into historical range in Arizona in 2004. The Department is the co-lead for the Tarahumara Conservation Team. Staff organize and lead meetings, work with partners to develop work plans and coordinate and implement priority conservation activities. All activities outlined below can be tied to the Tarahumara Frog 12-Step Reestablishment Proposal, and to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 124-125) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of the Tarahumara frog by gathering information on population and metapopulation dynamics, causes of declines, ecology and general natural history.
- Implement recovery strategies outlined in the Tarahumara Frog 12-Step Reestablishment Proposal (2004), such as translocations, reintroductions and habitat renovation to bolster extant metapopulations and, as appropriate, to restore this species to portions of its historical range.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long-term success of Tarahumara frogs in Arizona, thus avoiding the need to list under the ESA.
- Conservation actions for Tarahumara frogs will contribute directly to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and meet with the Tarahumara Frog Conservation Team to develop the recovery infrastructure and activities needed to attain the objectives outlined in the 12-Step Re-establishment Proposal. Partners include USFWS, USFS, USGS, ASDM, University of Arizona, and grazing permittees.

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

- Monitor extant populations of Tarahumara frogs to determine status and to evaluate success of management efforts.
- Collect skin swabs for PCR to detect chytrid fungus. Skin swabs will be collected from animals in the wild and in captive populations.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration

- Evaluate additional sites in which to stock Tarahumara frogs.
- Establish Tarahumara frog populations at one or more sites.
- Supplement existing reintroduction sites when appropriate.

LOCATION

Arizona, Santa Cruz County

TIMELINE

Annually

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 3. NORTHERN LEOPARD FROG

NEED

Although a 12-month finding published in October 2011 concluded the northern leopard frog did not warrant listing under the ESA, this species has declined significantly in Arizona and the Department is committed to its conservation; it is a Tier 1A species in the Arizona SWAP. Staff organize and lead meetings, work with partners to develop work plans, and to coordinate and implement priority conservation activities. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 122-123) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of the northern leopard frog by gathering information on historical and present distributions, genetics, disease, population and metapopulation dynamics, causes of declines, and general ecology and natural history.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.
- Implement conservation strategies such as translocations, reintroductions, invasive species removal and habitat renovation to bolster extant metapopulations and, as appropriate, to restore this species to portions of its historical range.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long-term success of northern leopard frogs in Arizona, thus avoiding the need to list under the ESA.
- Conservation actions for northern leopard frogs will contribute to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Identify new northern leopard frog populations, threats, and conservation opportunities.
- Monitor populations of northern leopard frogs to determine status and to evaluate success of management actions.
- Collect skin swabs for PCR to detect chytrid fungus. Skin swabs will be collected from animals in the wild and in captive populations.
- Collect toe tips for genetic analysis as needed and appropriate.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration

- Evaluate sites for stocking or augmentation on Apache-Sitgreaves, Coconino, and Kaibab national forests, BLM, Arizona State Land Department, Department properties, and private lands.
- Develop refugia and rearing facilities as needed.
- Establish or augment northern leopard frog populations at one or more sites. This process includes site selection, evaluation, and site renovation as needed; along with collection, propagation and release of frogs, eggs or tadpoles.

LOCATION

Arizona, Apache, Coconino, Mohave and Navajo counties.

TIMELINE

Annually

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 4. RELICT LEOPARD FROG

NEED

The relict leopard frog is a candidate for listing as threatened or endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. The Department is a member of the Relict Leopard Frog Conservation Team, where staff provide leadership, organize and lead meetings, work with partners to develop work plans, and coordinate and implement priority conservation activities. All activities outlined below can be tied to the Relict Leopard Frog Conservation Agreement and Strategy (2005), and to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (p. 123) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status the relict leopard frog by gathering information on population and metapopulation dynamics, disease, ecology and general natural history.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.
- Implement conservation strategies outlined in the Relict Leopard Frog Conservation Agreement and Strategy (2005), such as translocations, reintroductions, invasive species removal and habitat renovation to bolster extant metapopulations and, as appropriate, to restore species to portions of their historical range.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long term success of relict leopard frogs in Arizona, thus avoiding the need to list this candidate species under the ESA.
- Conservation actions for relict leopard frogs will contribute to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and meet 2 times per year with Relict Leopard Frog Conservation Team, and implement activities and achieve goals outlined in the Conservation Agreement and Rangeland Conservation Assessment and Strategy. Partners include USFWS, NPS, USBR, NDOW, UNLV, Southern Nevada Water District, Clark Co., NV, TNC, USGS, BLM, grazing permittees, private landowners.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey sites to identify threats, new relict leopard frog populations, and conservation opportunities.
- Monitor re-established populations of relict leopard frogs to determine status and evaluate success.
- Collect skin swabs for PCR to detect chytrid fungus. Skin swabs will be collected from animals in the wild and in captive populations.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration

- Evaluate sites for stocking or augmentation.
- Establish relict leopard frogs in the Black Mountains. Includes possible habitat renovation, collecting frogs, tadpoles or eggs, and translocation.
- Establish relict leopard frogs at Pagoon Springs. Includes possible vegetation removal by hand, collecting frogs, tadpoles or eggs, and translocation. (EAC required)

LOCATION

Mohave County, Arizona

TIMELINE

Annually

BUDGET

\$5,300

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 5. PLAINS AND LOWLAND LEOPARD FROGS

NEED

Plains and lowland leopard frogs are closed season, Tier 1A SGCN species, both of which have declined considerably throughout their historical ranges in Arizona. The Department is committed to coordinate and implement conservation activities as appropriate and feasible. For these SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 125-126) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of the Plains and lowland leopard frogs, by gathering information on historical and present distributions, population and metapopulation dynamics, disease ecology, invasive species, genetics, ecology and general natural history.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long-term success of plains and lowland leopard frogs in Arizona, thus avoiding the need to list under the ESA.
- Conservation actions for Plains and lowland leopard frogs will contribute to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey sites to identify regional threats, new Plains and lowland leopard frog populations and conservation opportunities.
- Collect skin swabs for PCR to detect chytrid fungus. Skin swabs will be collected from animals in the wild and in captive populations.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration

- Work with partners in the Notch Neighborhood, Tucson, lowland leopard frog conservation project.
- Evaluate sites for stocking or augmentation, as deemed appropriate.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$2,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 6. ARIZONA TREEFROG (HUACHUCA-CANELO HILLS DPS)

NEED

The Arizona treefrog Huachuca-Canelo Hills Distinct Population Segment is candidate for listing as threatened or endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. The Department is committed to coordinate and implement conservation activities as appropriate and feasible. Staff work with partners to develop work plans, and coordinate and implement priority conservation activities as appropriate and feasible. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 120-121) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of Arizona treefrogs in the Huachuca Mountains and Canelo Hills, by gathering information on historical and present distributions, population and metapopulation dynamics, disease, causes of declines, ecology and general natural history.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.
- Implement conservation strategies such as invasive species removal and habitat renovation to protect and bolster extant metapopulations.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should provide critical information, and in part result in stabilizing and ensuring the long term success of Arizona treefrogs in

- the Huachuca Mountains and Canelo Hills. Ultimately, we hope to obviate the need to list this candidate species under the ESA.
- Conservation actions for Arizona treefrogs will contribute directly to conservation and recovery of other native aquatic wildlife and conservation of those aquatic habitats.

APPROACH

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations or historical localities for Arizona treefrogs in the Huachuca Mountains, Canelo Hills and vicinity to determine status or to identify conservation opportunities.
- Monitor the current distribution of chytrid fungus in populations of Arizona treefrogs. Collect skin swabs for PCR analysis from animals in the wild.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

LOCATION

Cochise and Santa Cruz counties, Arizona.

TIMELINE

Annually; most activities occur from June through September.

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 7. SONORAN TIGER SALAMANDER

NEED

The Sonoran tiger salamander was listed in 1997 as endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. These salamanders are known only from the San Rafael Valley in southeastern Arizona, and recovery is challenged by habitat loss, disease, genetic swamping, invasive species, etc.. listed 1997). The Department is co-lead for the Sonoran Tiger Salamander Participation Team, and staff help to organize and lead meetings, work with partners to complete a 10-year occupancy monitoring project, develop work plans, coordinate and implement priority conservation activities and document progress in meeting Recovery Goals and achieving the down-listing and de-listing criteria. For this SGCN, all activities outlined in the Approach, below, can be tied to the Sonoran Tiger Salamander Recovery Plan, and to threats (pp. 57-89), actions (pp.

97-114), and information needs and conservation strategies (pp. 123-124) identified in the Arizona SWAP.

OBJECTIVES

- Continue to monitor extant and potential breeding sites for the 10-year occupancy protocol, and to document occurrence and reproductive success (including metamorphosis), and to identify presence of disease.
- Determine distribution, population status, and dispersal through surveys of known and potential habitat, or mark-recapture studies.
- Identify habitat requirements for successful breeding and larval development to maturity.
- Identify and implement management recommendations and habitat enhancements in cooperation with private landowners, federal agency partners, and other willing cooperators.
- Where possible, implement recovery actions and activities as described in the Sonoran Tiger Salamander Recovery Plan.

EXPECTED RESULTS AND BENEFITS

- Completion of the 10-year occupancy monitoring protocol will inform future management and recovery decisions.
- Implementation of recovery actions will contribute to down-listing and eventual de-listing of Sonoran tiger salamanders.
- Recovery actions and eventual recovery of Sonora tiger salamanders will contribute directly to recovery of other native aquatic wildlife (e.g., northern Mexican gartersnakes) and conservation of those aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and meet once a per year with Sonoran Tiger Salamander Participation Team, and implement activities and achieve goals outlined in the Sonoran Tiger Salamander Recovery Plan. Partners include USFWS, USFS, DOD, Arizona State Parks Department, TNC, private landowners and grazing permittees.

Create, Restore or Enhance Habitat and Natural Processes: Fish and wildlife habitat structure – (EAC required)

- Implement management strategies including, habitat enhancement and renovation.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, green sunfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Monitor known and potential breeding sites for salamander persistence, reproductive success, presence of disease or epidemic, and to determine habitat characteristics for successful breeding and maturation.
- Continue marking metamorphosed and branchiate salamanders to evaluate movements and population size.
- Collect salamanders exhibiting disease symptoms for examination. Collect water and substrate samples as needed for analysis. Analyze dead or moribund animals for disease factors.
- Collect dead and moribund individuals for voucher specimens and laboratory analysis.
- Continue to monitor the current distribution of chytrid fungus and ranavirus in populations of Arizona amphibians. Collect skin swabs for PCR analysis from animals in the wild and in captive populations.
- Implement or assist outside cooperators in studies of demography, dispersal, conservation genetics, disease, distribution, natural history, etc..

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Sonoran tiger salamander database.

LOCATION

Cochise and Santa Cruz counties, Arizona.

TIMELINE

Annually; most activities occur from January through April.

BUDGET

\$12,700

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.

SUB-PROJECT 8. REMAINING SGCN AMPHIBIAN CONSERVATION

NEED

Although many amphibian SGCN warrant extensive, species-specific projects to monitor or recover populations, others receive little research attention. Arizona has 25 native amphibian species, of which 18 species and one population have been identified in the Arizona SWAP as SGCN (Tier 1A, B and C), including one ESA-listed endangered species, one threatened species, and two candidates. Surprisingly little is known about most of Arizona's amphibians, including their status and distribution. Some of the native amphibians are rare or at risk from numerous threats such as loss or degradation of habitat, groundwater use, catastrophic wildfires, and invasive exotic species. One exotic

amphibian (American bullfrog) is a serious threat to other aquatic wildlife, and is a primary impediment to the recovery of declining native amphibians and reptiles. This sub-project refers to all SGCN amphibians in the Arizona SWAP (Appendix E) that are not included in sub-projects above. AGFD proposes to conduct necessary community or site-specific surveys to collect basic information on amphibian SGCN populations to determine their status, trends, and potential future research or management needs. All activities outlined below can be tied to threats (pp. 57-89), actions (pp. 96-114), and information needs and conservation strategies (pp. 125-126) identified in the Arizona SWAP.

OBJECTIVES

- Where possible, document the current status of SGCN amphibian species by gathering information on historical and present distributions, population dynamics, possible causes of declines, and general natural history.
- Conduct surveys, monitor populations and habitats, sample for disease, remove invasive exotic species, and identify management potential for specific sites.
- Collect a limited number of specimens from historical and newly identified locations for genetics, research, disease analysis, taxonomy, etc..
- Identify essential habitats, research needs, and other management recommendations.

EXPECTED RESULTS AND BENEFITS

- Current data on the status and distribution of SGCN amphibians and their habitats will allow managers to plan for or react to changes in land management, develop prescriptions for dealing with invasive exotic species and emerging diseases, identify research needs, and assess the need for refuge populations and/or habitat improvements.
- Recent data on SGCN amphibians will be used to update 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, conservation agreements, and progress reports.

APPROACH

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations and historical localities for SGCN amphibian species as needed to determine status or identify conservation opportunities.
- Collect a limited number of specimens from historical and newly identified locations for taxonomic analysis, genetics, research, health assessments.

- Continue to monitor the current distribution of chytrid fungus and ranavirus in populations of Arizona amphibians. Collect skin swabs for PCR analysis from animals in the wild and in captive populations.

LOCATION

Arizona, Statewide

TIMELINE

Annually

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

PROJECT 5: REPTILE CONSERVATION AND RECOVERY TOTAL = \$175,000

Principal Investigator -- Thomas R. Jones

SUB-PROJECT 1. FLAT-TAILED HORNED LIZARD

NEED

Although flat-tailed horned lizard (FTHL) has no ESA status, it is a Tier 1A species in the Arizona SWAP, and has been considered for listing as a threatened species under the ESA on four separate occasions since 1996. On each occasion, the FWS withdrew its proposed listing rule, largely because of protections afforded to the species by the 1996 FTHL Conservation Agreement, to which the Department is a signatory, and the 2003 Rangewide Management Strategy (RMS). The Department serves on the FTHL Interagency Coordinating Committee (ICC) and the Management Oversight Group, both of which provide guidance to signatory agencies regarding implementation of the RMS, and monitor and report on implementation progress. The RMS is a long-term plan of action among signatory agencies to ensure persistence of the species, and it is implemented by the Department in the Yuma Desert Management Area and surrounding habitat. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (p. 126) identified in the Arizona SWAP.

OBJECTIVES

- Continue to cooperate with other agencies signatory to the FTHL Conservation Agreement, to ensure that actions identified in the agreement, and the Rangewide Management Strategy on which it is based, are implemented in the United States and México.
- Minimize habitat loss or degradation, particularly in FTHL Management Areas.
- Assess compensation for habitat loss and disturbance, renovate and acquire habitat, protect habitat corridors, coordinate interagency field and management activities in the United States and México, provide law enforcement, provide public outreach, conduct research, secure funding sources, monitor populations, and renew, revise, or terminate the Conservation Agreement and Strategy.

- Implement management activities in coordination with USFWS species leads and with appropriate environmental compliance documentation.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions outlined in the RMS should continue to result in stable populations of FTHL in the United States and ensure the long term persistence of this species, thus continuing to avoid the need to list it under the ESA.
- Conservation actions for FTHL will contribute directly to recovery of other native wildlife and conservation of those habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Coordinate and meet with the FTHL Interagency Coordinating Committee (ICC) and the Management Oversight Group

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Implement management recommendations and guidelines (including surveying and monitoring) for the species and its habitats.
- Continue to conduct annual demographic monitoring surveys to determine population size, trends, recruitment, survival, and effects of environmental variables.
- Continue to conduct annual occupancy monitoring surveys to determine changes in distribution as well as habitat use.
- Collect life history, movement, demographic and habitat selection data through radio-telemetry studies and/or standard mark-recapture techniques at one or more sites for use in population viability and occupancy analyses.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.

Data Collection and Analysis: Techniques development

- Coordinate the analysis of rangewide monitoring data to determine regional population densities, trends, and occupancy throughout the species' range in Arizona and California.
- Conduct research and monitoring to determine the population size, density, survival rate, recruitment, and population growth rate of flat-tailed horned lizards within the Yuma Desert Management Area. This project will be part of a larger range-wide monitoring effort initiated by the FTHL ICC to monitor the status of FTHL populations in Management Areas and Research Areas throughout the lizard's range.

LOCATION

Yuma County, Arizona

TIMELINE

Annually

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 2. NORTHERN MEXICAN GARTERSNAKES

NEED

The Northern Mexican gartersnake is a candidate for listing as threatened or endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. A final listing package is anticipated to be released by the end of federal fiscal 2012. Little is known about the basic biology of this species and the Department is committed to its conservation. Staff co-lead the Gartersnake Conservation Working Group, organize and lead meetings, work with partners to develop work plans, and coordinate and implement priority conservation activities. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 128-129) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of Mexican gartersnakes by gathering information on historical and present distributions, genetics, population and metapopulation dynamics, proximate and ultimate causes of declines (including invasive species), and ecology and general natural history.
- Develop and implement recommendations on land-use practices and policies to halt slow, or reverse further population declines.
- Develop and implement conservation and recovery goals for gartersnakes and their habitats.
- Continue to investigate the suitability of a captive breeding and head-starting program as a conservation tool.
- As appropriate, restore the species to portions of their historical range.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long-term success of Mexican gartersnakes in Arizona.
- Conservation actions for Mexican gartersnakes will contribute to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Work with USFWS species co-lead and partners to continue to develop conservation goals and objectives for Mexican gartersnake recovery through the Gartersnake Conservation Working Group (GCWG) meetings.

- Continue to support the GCWG's implementation of the captive propagation and head-starting program for northern Mexican gartersnakes and continue to refine the program and captive husbandry techniques as necessary.
- Develop a conservation plan for Page Springs and Bubbling Ponds hatcheries to identify strategies that will protect northern Mexican gartersnakes under normal hatchery operations.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from Mexican gartersnake habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations, historical localities, and other likely areas to determine status or to identify conservation opportunities for Mexican gartersnakes.
- Implement management recommendations and guidelines (including survey, monitoring, research, etc.) for the species and its habitats.
- Conduct surveys to compare areas of apparent decline with apparently more stable populations, to investigate likely mechanisms of decline.
- Continue to collect tissue samples from northern Mexican gartersnakes for genetic analyses.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.
- Continue to monitor northern Mexican gartersnakes at Page Springs and Bubbling Ponds hatcheries to obtain demographic data and data that might explain how gartersnakes persist in the presence of invasive exotic predators and to guide habitat management recommendations for the hatcheries.
- Continue to collect natural history and habitat selection data through radio-telemetry studies of northern Mexican gartersnakes at Bubbling Ponds and Page Springs fish hatcheries.
- Conduct detailed population study at one or more sites, using standard mark-recapture techniques, including the upper Santa Cruz River in San Rafael Ranch State Natural Area.
- Identify additional northern Mexican gartersnake populations and monitor them as resources allow.
- Design and implement experiments to evaluate the effects of conservation and wildlife management tools on gartersnakes.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration (EAC required)

- Continue to support the GCWG's implementation of the captive propagation and head-starting program for northern Mexican gartersnakes and continue to refine the program and captive husbandry techniques as necessary.
- Test and evaluate implementation of conservation and management strategies such as release of captive bred/head-started northern Mexican gartersnakes and habitat enhancement for the species.
- Investigate and test experimental translocation as a technique for augmenting existing, or reestablishing wild populations of northern Mexican gartersnakes.
- Secure existing or re-establish new wild populations of northern Mexican gartersnakes.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$52,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 3. NARROW-HEADED GARTERSNAKE

NEED

Although narrow-headed gartersnakes are not listed under the ESA, this species has declined significantly in Arizona, is a Tier 1A species in the Arizona SWAP, and the Department is committed to its conservation. In addition, the USFWS is preparing a listing package for this species, which is anticipated to be released by the end of federal fiscal 2012. Staff co-lead the Gartersnake Conservation Working Group, organize and lead meetings, work with partners to develop work plans, implement work plans, etc.. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 127-128) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of narrow-headed gartersnakes by gathering information on historical and present distributions, genetics, population and metapopulation dynamics, proximate and ultimate causes of declines (including invasive species), and ecology and general natural history.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.

- Develop and implement conservation and recovery goals for gartersnakes and their habitats.
- Continue to investigate the suitability of a captive breeding and head-starting program as a conservation tool.
- As appropriate, restore the species to portions of their historical range.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long term success of narrow-headed gartersnakes in Arizona, thus avoiding the need to list under the ESA.
- Conservation actions for narrow-headed gartersnakes will contribute to recovery of other native aquatic wildlife and conservation of aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Work with USFWS species co-lead and partners to continue to develop conservation goals and objectives for narrow-headed gartersnake recovery through the Gartersnake Conservation Working Group (GCWG) meetings.
- Continue to support the GCWG's implementation of the captive propagation and head-starting program for narrow-headed gartersnakes and continue to refine the program and captive husbandry techniques as necessary.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species from narrow-headed gartersnake habitats as needed for conservation.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations and historical localities, or other sites as needed, for narrow-headed gartersnakes to determine status or to identify conservation opportunities.
- Implement management recommendations and guidelines (including survey, monitoring, research, etc.) for the species and its habitats.
- Conduct surveys to compare areas of apparent decline with apparently more stable populations, to investigate likely mechanisms of decline.
- Continue to collect tissue samples from narrow-headed gartersnakes for genetic analyses.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.

- Collect life history (e.g. survival, behavior, etc.) and habitat selection data through radio-telemetry studies at one or more sites in Arizona.
- Conduct detailed population study at one or more sites, using standard mark-recapture techniques.
- Design and implement experiments to evaluate the effects of conservation and wildlife management tools on gartersnakes.

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- Maintain and update the Riparian Herpetofauna Database.

Species Re-introduction and Stocking: Native species restoration (EAC required)

- Continue to support the GCWG's implementation of the captive propagation and head-starting program for narrow-headed gartersnakes and continue to refine the program and captive husbandry techniques as necessary.
- Investigate and test experimental translocation as a technique for augmenting existing, or reestablishing wild populations of narrow-headed gartersnakes.
- Test and evaluate implementation of conservation and management strategies such as release of captive bred/head-started narrow-headed gartersnakes and habitat enhancement for the species.
- Secure existing or establish new wild populations of narrow-headed gartersnakes.

LOCATION

Arizona, Apache, Coconino, Navajo and Yavapai counties.

TIMELINE

Annually

BUDGET

\$7,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 4. TUCSON SHOVEL-NOSED SNAKE

NEED

The Tucson shovel-nosed snake is a candidate for listing as threatened or endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. Significant gaps remain in our understanding of the genetic relationships among the various subspecies of shovel-nosed snakes, the taxonomic validity of this subspecies, its distribution, and basic ecology and natural history. Staff work with partners to identify priority information needs and gather that information, and coordinate and implement priority conservation activities. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (p. 131) identified in the Arizona SWAP.

OBJECTIVES

- Document the current status of Tucson shovel-nosed snakes by gathering information on historical and present distributions.
- Collect tissue samples to describe genetic variability.
- Conduct field surveys and monitoring programs to determine relative or absolute abundance, distribution, population status, and management needs.
- Develop and implement recommendations on land-use practices and policies to halt, slow or reverse further population declines.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long-term success of Tucson shovel-nosed snakes, thus avoiding the need to list under the ESA.
- Conservation actions for Tucson shovel-nosed snakes will contribute directly to recovery of other native wildlife and conservation of shared habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- See Project 1.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Conduct road surveys to delineate the distribution of Tucson shovel-nosed snakes and other shovel-nosed snake subspecies.
- Work with internal and external collaborators to obtain ecological information on the species and to survey additional sites.
- Conduct studies to compare areas of apparent decline with apparently more stable populations, to investigate likely mechanisms of decline.
- Implement recommendations and guidelines for management of the species and its habitats (including survey, monitoring, research, etc.).
- Continue to collect tissue samples from shovel-nosed snakes for genetic analyses.
- Recover mortalities in Arizona for necropsy, disease testing, or museum specimens.
- Conduct detailed population study at one or more sites, using standard mark-recapture techniques.

LOCATION

Arizona, Maricopa, Pinal, Pima, Yuma, and La Paz counties.

TIMELINE

Annually; most activities occur between April and September.

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 5. NEW MEXICO RIDGE-NOSED RATTLESNAKE

NEED

The New Mexico ridge-nosed rattlesnake was listed in 1978 as threatened under the ESA, and is a Tier 1A species in the Arizona SWAP. In Arizona, this subspecies of ridge-nosed rattlesnakes is known only from the Pelocillo Mountains in the extreme southeastern portion of the state along the New Mexico state line. New Mexico ridge-nosed rattlesnakes are exceedingly rare in Arizona, and little is known of their exact distribution or population status. Staff work with partners to identify priority information needs and gather that information, develop work plans, and coordinate and implement priority recovery activities for New Mexico ridge-nosed rattlesnakes. For this SGCN and federally listed species all activities outlined below can be linked to the New Mexico Ridgenose Rattlesnake Recovery Plan (1985). Also, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 121-122) identified in the Arizona SWAP.

OBJECTIVES

- Investigate the distribution, natural history, and habitat requirements of New Mexico ridge-nosed rattlesnakes in Arizona, New Mexico and México, using standardized and widely accepted herpetological sampling methods. The results will provide information on the status of this subspecies in Arizona, and provide a better foundation for management decisions.
- Collaborate with government agencies, private landowners, permittees, and other stakeholders to revise and more effectively implement the Recovery Plan.
- Implement management activities in coordination with USFWS species leads.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing the population of New Mexico ridge-nosed rattlesnakes in Arizona and ensuring their long term success, thus contributing to recovery of the subspecies throughout its geographical distribution.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Cooperate with New Mexico Department of Game and Fish, USFWS, and other stakeholders to revise the Recovery Plan.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) for the species and its habitats.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Work with internal and external partners to survey for the species and establish monitoring protocols for the species and its habitats.

- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, and genetic analyses.

LOCATION

Arizona, Cochise County

TIMELINE

Annually

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 6. SONORAN DESERT TORTOISE

NEED

The Sonoran desert tortoise is a candidate for listing as threatened or endangered under the ESA, and is a Tier 1A species in the Arizona SWAP. The Department has been committed to conservation actions and to monitoring this species for over two decades. Staff co-lead (with USFWS) the Arizona Interagency Desert Tortoise Team (AIDTT) to set conservation priorities for Sonoran desert tortoises. Staff also coordinate and implement annual monitoring efforts, field research, and the Department's Tortoise Adoption Program (TAP). For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 130-131) identified in the Arizona SWAP.

OBJECTIVES

- Conduct appropriate management and monitoring activities to provide geographically and ecologically broad coverage of the Sonoran desert tortoise in Arizona.
- Monitor long-term monitoring plots (LTMP) and occupancy study areas on a rotating basis, so each site is revisited at a biologically meaningful time interval (ca. 3-5 years) to allow determination of population trends at specific sites and across the State.
- Develop and implement the State Conservation Agreement, Assessment and Strategy for the Sonoran Desert Tortoise (SCA) with AIDTT partners. Integrate inventory, monitoring, and management efforts and develop cost-sharing agreements with cooperators.
- Coordinate translocations as needed.
- Implement management activities in coordination with cooperators.
- Along with partners, continue to implement the tortoise adoption program (TAP).

EXPECTED RESULTS AND BENEFITS

- Monitoring programs contribute to overall understanding of population dynamics of Sonoran desert tortoises, and inform management strategies.
- Department actions along with and through the AIDTT implement the Draft "Sonoran Desert Tortoise State Conservation Assessment, Agreement and Strategy" which is

- designed to provide an enforceable management strategy for Sonoran desert tortoises in Arizona to conserve existing populations, to reduce and remove threats to desert tortoises and their habitat, and avoid the need to list under the ESA.
- The TAP ensures custodial care for displaced wild tortoises and their offspring, thus limiting release into the wild or additional removal from the wild, while providing outreach to the public about conservation issues.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Work with USFWS species co-lead and AIDTT partners (ASLD, BIA, BLM, BOR, DOD [US Army-YPG, USMC-BMGR, and USAF-LAFB], NPS, USFS) to develop the SCA.
- Identify any necessary changes in methods and sampling intervals for the long-term monitoring program.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats.
- Participate in planning mitigation related projects, including translocations.
- Plan and hold annual TAP meetings with partners (ASDM and PHS) to identify any necessary changes in adoption guidelines and protocols, and needs for the current and future adoption cycles.

Technical Assistance – Technical Assistance – With Individuals and Groups Involved in Resource Management Decision Making

- Continue to coordinate the Tortoise Adoption Program (TAP), and plan and hold annual TAP meetings with partners (ASDM and PHS) to identify any necessary changes in adoption guidelines and protocols, and needs for the current and future adoption cycles.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Implement recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats.
- Conduct and continue to support population monitoring and habitat surveys in cooperation with AIDTT partners including capture-recapture complete coverage surveys of LTMPs and occupancy surveys on 3-ha sites within new study areas for use in population viability and occupancy analyses. Identify any necessary changes in methods or sampling intervals.
- Continue to monitor desert tortoise population at Sugarloaf Mountain, Tonto National Forest and collect natural history and habitat selection data using standard capture-recapture techniques.
- Continue to monitor for disease and evaluate each tortoise encountered (captive or wild) for signs of upper respiratory tract disease (URTD), shell disease, and other health anomalies. When necessary, collect blood samples and conduct appropriate

- analyses to determine population genetics, assess contaminants levels, and exposure to Mycoplasma (URTD) or other potential pathogens.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.
 - Continue to collect natural history and habitat selection data through radio-telemetry study on juvenile desert tortoises at Sugarloaf Mountain, Tonto National Forest.
 - Study the effectiveness of fencing and crossing structures for desert tortoises along state highway 87, and other highways as necessary.
 - Develop a landscape-scale predictive model to identify desert tortoise activity centers, map tortoise distribution, and determine phylogenetic grouping to assist managers in evaluating potential military training impacts.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$93,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 7. MOJAVE DESERT TORTOISE

NEED

The Mojave desert tortoise was listed in 1990 as threatened under the ESA, and is a Tier 1A species in the Arizona SWAP. A Revised Recovery Plan for the Mojave Population of the Desert Tortoise, *Gopherus agassizii* was produced in 2011. Although this species occurs only in a small portion of the Arizona Strip, the Department is committed to participating in recovery actions, as appropriate. Staff provide state representation on the Mojave desert tortoise Management Oversight Group (MOG), the Desert Tortoise Monitoring Committee, and membership in the Utah/Arizona workgroup of the North-East Mojave Recovery Implementation Team (RIT). All activities outlined below can be tied to the Revised Recovery Plan for the Mojave Population of the Desert Tortoise, and to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 131-132) identified in the Arizona SWAP.

OBJECTIVES

- Participate in USFWS Desert Tortoise Recovery Office (DTRO) MOG meetings.
- Implement recovery actions as described in the Recovery Plan.
- Participate in planning, and as appropriate, implementation, and monitoring of mitigation-related projects.
- Participate in the Utah/Arizona workgroup of the North-East Mojave Recovery Implementation Team (RIT).

- Implement management activities in coordination with USFWS and BLM species leads, and goals identified through the RIT.

EXPECTED RESULTS AND BENEFITS

- Recovery actions for Mojave desert tortoises will contribute to eventual delisting of the species.
- Recovery actions and eventual recovery of Mojave desert tortoises will contribute directly to recovery of other native wildlife and conservation of those Mojave Desert habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Participate in planning translocations and mitigation-related projects.
- Participate in MOG meetings with partners (BLM, CDFG, DOD [Army, Air Force, Navy, and Marines], NDOW, NPS, UDOW, USFWS, USGS, and County Governments [CA, NV, and UT]).
- Participate on Northeast Mojave Recovery Implementation Team, as described in the revised Recovery Plan.
- Work with USFWS and BLM to identify any necessary changes to range-wide monitoring and recovery efforts within the Northeast Mojave Recovery Unit.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Work with USFWS to implement sampling methods described in the Recovery Plan in conjunction with range-wide monitoring and recovery efforts within the Northeast Mojave Recovery Unit.
- Evaluate each tortoise encountered for signs of upper respiratory tract disease (URTD), shell disease and other health anomalies. Collect blood samples and conduct analyses to determine population genetics and to assess contaminants levels and mycoplasma (URTD) exposure and for other potential pathogens.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.
- Conduct and continue to support population monitoring and habitat surveys in cooperation with AIDTT partners including capture-recapture complete coverage surveys of LTMPs and occupancy surveys on 3-ha sites within new study areas for use in population viability and occupancy analyses. Identify any necessary changes in methods or sampling intervals.
- Study the effectiveness of fencing and crossing structures for desert tortoises along state highways

LOCATION

Arizona Strip in Mohave County, Arizona.

TIMELINE

Annually

BUDGET

\$2,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 8. ORNATE (DESERT) BOX TURTLE

NEED

The desert box turtle, a subspecies of ornate box turtles, is a closed season, Tier 1A SGCN species. It has apparently declined considerably in much of its historical Arizona range, however, little is known about its basic biology, current distribution and the identity and extent of threats. The Department is committed to conservation of desert box turtles. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 129-130) identified in the Arizona SWAP.

OBJECTIVES

- Coordinate and implement priority conservation activities for desert box turtles.
- Work with partners to develop and implement research and conservation goals, and a monitoring strategy for box turtle management.
- Coordinate and manage the Ornate Box Turtle Watch, a citizen science project which collects observational data on box turtles from the public.

EXPECTED RESULTS AND BENEFITS

- Surveys and observational data will assist in determination of threats to the species, and the development of plans to implement conservation actions.
- The Department benefits by implementing a citizen science program which enables the public to participate in conservation of this species.
- Conservation actions for desert box turtles will contribute directly to recovery of other native wildlife and conservation of grassland habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Initiate collaborative partnerships with BLM, USFS, USFWS, NGOs, etc., to develop conservation goals and objectives for desert box turtles in Arizona.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) for this species and its habitat.

- Continue to develop citizen science survey techniques for the “Ornate Box Turtle Watch.”

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Conduct and continue to support appropriate management and monitoring activities to collect natural history and habitat selection data including capture-recapture using visual surveys, and radio-telemetry.
- Conduct blood sampling and analyses to determine population genetics and presence/absence of disease.
- Continue to monitor for disease and evaluate each desert box turtle encountered (captive or wild) for signs of upper respiratory tract disease (URTD), shell disease, and other health anomalies. When necessary, collect blood samples and conduct appropriate analyses to determine population genetics, assess contaminants levels, and exposure to Mycoplasma (URTD), herpes virus, Rana virus, or other potential pathogens.
- Recover mortalities for necropsy, disease testing, museum specimens, or genetic analyses.
- Continue to work with the public through the “Ornate Box Turtle Watch” to obtain information on box turtle distribution, and to refine citizen science survey techniques.

LOCATION

Cochise, Graham, Greenlee, Pima and Santa Cruz counties, Arizona.

TIMELINE

Annually

BUDGET

\$3,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 9. SONOYTA MUD TURTLES

NEED

The Sonoyta mud turtle is a candidate for listing as threatened or endangered under the ESA, and is Tier 1A in the Arizona SWAP. The Department is committed to conservation actions and to monitoring this species which, in the United States occurs only in Organ Pipe Cactus National Monument, and in México only in the nearby Río Sonoyta. Staff lead the Quitobaquito/Río Sonoyta Working Group (QRSWG) which sets conservation priorities for the Sonoyta mud turtle, Sonoyta pupfish (ESA endangered), Quitobaquito springsnail (petitioned for listing under ESA), and longfin dace in the Río Sonoyta drainage. For this SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 126-127) identified in the Arizona SWAP.

OBJECTIVES

- Continue to coordinate the Quitobaquito/Río Sonoyta Working Group.
- Conduct appropriate management and monitoring activities, including annual capture-recapture surveys in Organ Pipe Cactus National Monument and along the Rio Sonoyta (Sonora, México).
- Develop and implement the Quitobaquito / Rio Sonoyta Candidate Conservation Agreement, Assessment and Strategy (CCA).
- Coordinate emergency salvage and translocation as needed; and when appropriate, repatriate mud turtles back to Quitobaquito pond.
- Integrate inventory, monitoring and management efforts with those of cooperators.
- Develop cost-sharing agreements with other agencies and organizations. Implement management activities in coordination with cooperators.

EXPECTED RESULTS AND BENEFITS

- Implementation of conservation actions should result in stabilizing and ensuring the long term success of Sonoyta mud turtles in Arizona and adjacent Sonora, thus avoiding the need to list under the ESA.
- Conservation actions for Sonoyta mud turtles will contribute directly to recovery of other native aquatic wildlife in Quitobaquito Pond and the Rio Sonoyta drainage, including Sonoyta pupfish, Quitobaquito springsnail, and longfin dace and conservation of those unique aquatic habitats.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Work with QRSWG partners (NPS, CEDES, CONANP, UA, and USFWS) to develop the CCA.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) of the species and its habitats in Arizona and Sonora, Mexico.
- Develop captive husbandry techniques for the Sonoyta mud turtle assurance colony at the Arizona-Sonora Desert Museum, and work with QRSWG partners to continue to refine the program.
- Identify any necessary changes in methods and sampling intervals for the monitoring program.
- Plan and hold annual QRSWG meetings to coordinate monitoring activities, and report on CCA task progress.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Conduct and continue to support appropriate international management and monitoring activities, including capture-recapture using visual surveys, trapping and

- radio-telemetry, at Quitobaquito and Rio Sonoyta for studies on demographics microhabitat use, and reproductive ecology.
- Conduct blood sampling and analyses to determine population genetics and to assess contaminants levels.
 - Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.

Species Re-introduction and Stocking: Native species restoration (EAC required)

- Salvage Sonoyta mud turtles as needed from Quitobaquito Pond during renovations. Maintain turtles in captivity until the pond has stabilized and they can be returned.
- Translocate Sonoyta mud turtles from the existing water treatment facility lagoon and Xochimilco pond in Sonoyta, México into renovated lagoons, the lagoons at the new facility once water quality has stabilized, and into suitable and stable refuge sites along the Rio Sonoyta in Sonora, México.
- Maintain an assurance colony from Sonoyta mud turtles salvaged from Quitobaquito Pond at the Arizona-Sonora Desert Museum (ASDM).
- Develop captive husbandry techniques for the Sonoyta mud turtle assurance colony at ASDM, and work with QRSWG partners to continue to refine the program.

LOCATION

Organ Pipe Cactus National Monument, Pima County, Arizona; Sonora, México

TIMELINE

Annually

BUDGET

\$4,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 10. ARIZONA, SONORAN AND YELLOW MUD TURTLES

NEED

Arizona, Sonoran and yellow mud turtles are Tier 1B species in the Arizona SWAP. Very little is known about the status or distribution of Arizona and yellow mud turtles, or about threats they may face. Sonoran mud turtles have been heavily impacted by invasive exotic species (including crayfish and American bullfrogs) which have apparently caused declines in parts of its historical Arizona range. The Department is committed to coordinate and implement conservation activities for these long-lived species as appropriate and feasible. For these SGCN, all activities outlined in the Approach, below, can be tied to threats (pp. 57-89), actions (pp. 97-114), and information needs and conservation strategies (pp. 126-127) identified in the Arizona SWAP.

OBJECTIVES

- Develop cooperative partnerships to identify essential habitats, research needs, and other management recommendations for Arizona, Sonoran and yellow mud turtle management.
- Conduct field surveys to determine relative or absolute abundance, long-term population trends, distribution, population status, mechanisms to reduce abundance of nonnative invasive species, and management needs.
- Reduce threats of invasive species where practicable and monitor results.
- Implement management activities in coordination with cooperators.
- Collect a limited number of specimens from historical and newly identified locations for genetic and disease analysis, research, or to establish new wild or captive populations, where appropriate.

EXPECTED RESULTS AND BENEFITS

- This program provides data to support inclusion or removal from SGCN list and in prioritization of these species.
- The program documents our goal of keeping common species common and highlighting declining species in which research and conservation efforts are needed.
- Data are used to evaluate and predict effects of habitat change, determine effects of land management actions, and assist in establishing management and conservation priorities.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Initiate collaborative partnerships with BLM, USGS, USFS, USFWS, NGOs, etc., to develop conservation goals and objectives, and determine survey and monitoring needs for Arizona, Sonora and yellow mud turtles in Arizona.
- Develop recommendations and guidelines for management (including survey, monitoring, research, etc.) for this species and its habitat.
- Develop monitoring plan for Sonora mud turtles using capture-recapture techniques.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Monitor the effects of bullfrog removal efforts on Sonoran mud turtles.
- Investigate mechanisms for eliminating exotic predators/competitors (i.e., nonnative turtles, bullfrogs, crayfish, etc.).
- Continue exotic turtle removal efforts at Papago Park.
- Remove invasive exotic species (e.g., bullfrogs, crayfish, etc.) from aquatic habitats as needed for conservation. Monitor the success of removal efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Conduct and continue to support appropriate management and monitoring activities including visual surveys, trapping, capture-recapture, radio-telemetry, etc., for studies on demographics, microhabitat use, and reproductive ecology.
- Monitor effects of Bonita Creek and other native fish restoration projects on Sonoran mud turtles.
- Conduct blood sampling and analyses to determine population genetics, disease status, and to assess contaminants levels.
- Recover mortalities in Arizona for necropsy, disease testing, museum specimens, or genetic analyses.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$7,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 11. REMAINING SGCN REPTILE CONSERVATION

NEED

Although many reptile SGCN warrant extensive, species-specific projects to monitor or recover populations, others receive little research attention. Arizona has 107 native reptile species, of which 54 species or populations have been identified in the Arizona SWAP as SGCN (49 Tier 1A, B and 5 Tier 1C), including two ESA-listed threatened species, and five candidates, and one proposed for listing by USFWS. Surprisingly little is known about most of Arizona's reptiles, including their status and distribution. Some native reptiles are rare or at risk from threats such as loss or degradation of habitat, groundwater use, catastrophic wildfires, and invasive exotic species. One exotic amphibian (American bullfrog) is a serious threat to other aquatic wildlife, and is a primary impediment to the recovery of some declining native reptiles. This sub-project refers to all SGCN reptiles in the Arizona SWAP (Appendix E) that are not included in sub-projects above. AGFD proposes to conduct necessary community or site-specific surveys to collect basic information on reptile SGCN populations to determine their status, trends, and potential future research or management needs. All activities outlined below can be tied to stressors (pp. 57-89), actions (pp. 96-113), and information needs and conservation strategies (pp. 131-132) identified in the Arizona SWAP.

OBJECTIVES

- Where possible, document the current status of SGCN reptile species by gathering information on historical and present distributions, population dynamics, possible causes of declines, and general natural history.

- Conduct surveys, monitor populations and habitats, remove invasive exotic species, and identify management potential for specific sites.
- Collect a limited number of specimens from historical and newly identified locations for genetics, research, disease analysis, taxonomy, etc..
- Identify essential habitats, research needs, and other management recommendations.

EXPECTED RESULTS AND BENEFITS

- Current data on the status and distribution of SGCN reptiles and their habitats will allow managers to plan for or react to changes in land management, develop prescriptions for dealing with invasive exotic species and emerging diseases, identify research needs, and assess the need for refuge populations and/or habitat improvements.
- Recent data on SGCN reptiles will be used to update 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, conservation agreements, and progress reports.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- See Project 1.

Create, Restore or Enhance Habitat and Natural Processes: Invasive species control – Animal-mechanical

- Remove invasive exotic species (plants and animals) from wildlife habitats as needed for conservation and restoration efforts.

Data Collection and Analysis: Research, Survey or Monitoring – Fish and Wildlife Species

- Survey extant populations and historical localities for SGCN reptile species as needed to determine status or identify conservation opportunities.
- Collect a limited number of specimens from historical and newly identified locations for taxonomic analysis, genetics, research, health assessments.
- Continue to monitor the current distribution of ranavirus in populations of Arizona turtles. Collect tissue samples for PCR analysis from living or recently dead animals in the wild and in captive populations.

LOCATION

Arizona, Statewide

TIMELINE

Annually

BUDGET

\$4,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

PROJECT 6: BIRD CONSERVATION AND RECOVERY TOTAL = \$316,000

Principle Investigator – James Driscoll

SUB-PROJECT 1. ARIZONA BIRD CONSERVATION INITIATIVE

NEED

Approximately 545 species of birds have been documented in Arizona, including roughly 300 species which breed annually in the state. Of these, 145 species are currently considered SGCN in Arizona (Tiers A, B, C). Through the Arizona Bird Conservation Initiative, the Department coordinates planning and implementation efforts to conserve, monitor and enhance bird populations and their habitats by developing and maintaining a diverse partnership dedicated to the conservation of all birds (as identified by the SWAP) and promoting management recommendations identified in the Arizona Partners in Flight Bird Conservation Plan. All species described below are designated as SGCN in the 2012 Arizona SWAP, a designation determined by inadequate information and population vulnerability (see SGCN ranking models). AGFD seeks to remedy information gaps with additional monitoring and surveys in cooperation with research partners, thereby achieving SGCN information goals and maintaining partnerships that strive for conservation of avian SGCN. These research needs are reflected in the 2012 Arizona SWAP through the monitoring objectives provided in pp. 132-133, including monitoring unknown status species (p. 152). Partnerships are emphasized in the SWAP and many for avian conservation (including many of the below SGCN) are reflected in Table 4 (p. 158).

OBJECTIVES

Through planning and coordination, maintain and strengthen a broad-based partnership of agencies and organizations committed to the conservation of birds and their habitats, that:

- Serves as a vehicle for information sharing and coordination via regional and statewide forums.
- Collaborates to identify and prioritize bird conservation opportunities and needs.
- Promotes landscape-oriented multi-species population monitoring and conservation efforts.
- Tiers down National/Regional Conservation plans strategies to AZ specific priority-setting and conservation planning efforts (including monitoring objectives) for various bird groups.

EXPECTED RESULTS AND BENEFITS

- Informed management decisions for bird conservation.
- Cooperative and coordinated efforts (including monitoring) for achieving species and habitats conservation goals.
- Identification of research needs for those species with declining populations.

- Enhanced coordination and integration with state, regional, national and international bird partnerships to address conservation needs of Arizona priority species across their distribution range.

APPROACH

Coordination and Administration – Coordination and Administration – Program/Project Administrative Support

- Administer conservation projects funded to implement recommendations for the conservation of high priority bird species or habitats as identified by the SWAP, Arizona PIF Bird Conservation Plan or any of the 4 national bird initiatives through the ABCI Grants Program (depending on availability of funds).
- Maintain state level coordination of the North American Breeding Bird Survey to assist in monitoring the status and trends of North American bird populations.
- Support and promote existing training workshops that will assist in the implementation of the AZ Coordinated Bird Monitoring (AZCBM) Program.
- Continue development and planning of the statewide Arizona Coordinated Bird Monitoring Program (AZCBM) to provide long-term population trend data for most species of birds in the state and evaluate the effects of management actions and stressors.
- Maintain, expand, and update the ABCI website as appropriate.
- Continue design of a framework for a Citizen Science Program to implement wildlife projects that rely on data reporting and gathering by citizen scientists.
- Support international conservation initiatives such as: the Important Bird Areas (IBA) Program; the Southern Wings Program; Sonoran and Intermountain West Joint Ventures, PIF Western Working Group, North American Waterfowl Management Plan, and U.S. National Ramsar Committee by seeking opportunities to collaborate with México to implement conservation actions (habitat protection/enhancement, survey and monitoring, public outreach).

Data Collection and Analysis – Database Development and Management – Database development

- Seek opportunities to move forward in planning for the development of an AZ Avian Data Center.

Species Reintroduction and Stocking – Native Species Restoration - Translocation

- Thick-billed Parrot Conservation (*Rhynchopsitta pachyrhyncha*)
 - Evaluate feasibility of species translocations into areas within its historic range in Arizona.
 - Review administrative and regulatory (including Mexican regulations for exportation of parrots) processes to be considered for any future Arizona translocations.
 - Assist Mexican partners in determining occurrence and habitat requirements through auditory and visual observation point surveys in the Sierra Madre Occidental of México.

- Support Mexican partners in assessing the impacts of habitat changes occurring within occupied range.
- Support Mexican partners in learning more about the natural history of the species.
- Cooperate with Mexican partners in evaluating known or suspected sites of occurrence for comparison with any future translocations sites in the United States and México.
- Cooperate with any translocation efforts that may occur in México.
- Masked Bobwhite (*Colinus virginianus ridgwayi*)
 - Participate in habitat evaluations to determine the potential for translocation efforts in México and/or the United States.

Partner Engagement – Governmental Agency, Non-Governmental Agency, Others.

- Active participation in Sonoran and Intermountain West Joint Ventures, PIF Western Working Group, Southern Wings and other similar partnerships.
- Hold annual state and regional coordination meetings to serve as a forum for information sharing and AZCBM implementation coordination with local bird conservation partners and volunteers.
- Support the Important Bird Areas (IBA) Program. A partnership of Audubon and the Department, engaged in IBA identification, conservation planning, and on-the-ground conservation actions at priority bird habitats.
- Support work of the Southern Wings Program by seeking opportunities to collaborate with México to implement conservation actions (habitat protection/enhancement, survey and monitoring, public outreach) that support migratory bird species throughout their life cycle to ensure effective protection year-round. One specific activity will be through an agreement with Pronatura, to build a cattle-exclusion fence and install signage that will contribute towards the conservation of riparian/wetlands dependent migratory birds within the El Doctor Wetlands in Sonora, México. Other projects may be implemented as funding and opportunities allow.

Outreach – Recruitment and Retention Activities – For Wildlife Watching

- Maintain, expand, and update the ABCI website as appropriate.
- Promote bird conservation among the general public through support of International Migratory Bird Day and other similar activities.
- Coordinate with the Watchable Wildlife Program to continue exploring the feasibility of establishing a statewide birding trail system.

Note – Outreach will not consist of more than 10% of this sub-project's budget.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Year-round.

BUDGET

\$60,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 2. ARIZONA COORDINATED BIRD MONITORING PROGRAM

NEED

Approximately 545 species of birds have been documented in Arizona, including roughly 300 species which nest annually in the state. Of the 145 species that are currently considered SGCN in Arizona (Tiers A, B, C), only 20 species are monitored sufficiently to determine population trend. This fact is further exemplified when only six of the twelve species of federally listed and candidate bird species in the state are sufficiently monitored. This basic information is required to determine and prioritize which species are most deserving of immediate conservation efforts with a goal to reduce the need for federal listing and keeping common species common. AGFD seeks to remedy information gaps with additional monitoring and surveys in cooperation with research partners, thereby achieving SGCN information goals and maintaining partnerships that strive for conservation of avian SGCN. These research needs are reflected in the 2012 Arizona SWAP through the monitoring objectives provided in pp. 133-134, including monitoring unknown status species (p. 152). Partnerships are emphasized in the SWAP and many for avian conservation (including many of the below SGCN) are reflected in Table 4 (p. 158).

OBJECTIVES

Document the current status of SGCN bird species by gathering information on historical and present distributions, population dynamics, proximate and ultimate causes of declines, and general natural history:

- Conduct surveys, monitor populations and habitats, and identify management potential for specific sites.
- Identify essential habitats, research needs, and other management recommendations.
- Through close coordination among federal, state, and private entities continue implementation of a statewide coordinated bird monitoring program which provides long-term population trend data for SGCN and other bird species.
- Address monitoring needs and information gaps identified in the Arizona Partners in Flight Bird Conservation Plan.

EXPECTED RESULTS AND BENEFITS

Current data on the status and distribution of SGCN birds and their habitats will allow managers to:

- Plan for, react, and make informed land management decisions.
- Identify research needs.
- Assess the need for habitat improvements.
- Supply information to the USFWS on regional and national assessments of bird populations by using the data to comment on 5-yr status reviews, candidate notice of

reviews, ESA Section 7 consultations, HDMS queries, conservation agreements, and progress reports.

APPROACH

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

- North American Marsh Bird Surveys – following national protocol, conduct annual call playback surveys at established points.
- Western (U.S.) Colonial Aquatic Bird Nest Inventory – Following protocol, annually visit known nesting colonies and obtain an actual or estimated count of active nests and adults.
- Winter Aquatic Bird Surveys
 - Phoenix Area Survey – Continue to coordinate a single-day, mid-January count of all wild aquatic birds at urban ponds, lakes and canals in the Greater Phoenix Area.
 - Reservoir Survey – Continue boat-based surveys in mid- January to count wild aquatic birds utilizing various river reservoirs.
- North American Breeding Bird Surveys (BBS) – Following national protocol, annually conduct single-morning auditory and visual observation point surveys along established road routes.
- Nightjar Surveys – Following national protocol, annually conduct single-evening auditory and visual observation point surveys along established road routes.
- Riparian, Sonoran Desert, and Grassland Breeding Bird Surveys – Using both auditory and visual survey techniques, conduct morning area search and point-count surveys within an established plot to determine diversity and density of breeding avian species.
- National Audubon Christmas Bird Counts – Using both auditory and visual techniques conduct annual, area search survey within a section of an established (or new) 15 mi. diameter count.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Most activities occurring from December through June.

BUDGET

\$59,400

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 3. RAPTOR MANAGEMENT PROGRAM

NEED

Forty-four species of raptors occur in Arizona, and 37 breed in the state. Of these, 22 species are currently considered SGCN (Tiers A, B, C) in Arizona. Historically and in general, over the past 70 years most raptor populations have declined. The Raptor Management Program was developed to address the management and monitoring needs of this unique group of bird species. In addition to addressing the threats to population abundance and species occurrence, the Raptor Management Program assists with the incorporation of raptor conservation measures in development projects, and urban expansion. AGFD proposes to conduct necessary community and species specific surveys to monitor raptor SGCN populations to determine their status, trends, and potential future research or management needs. These research needs are reflected in the 2012 Arizona SWAP through the monitoring objectives provided in pp. 136-138, including monitoring unknown status species (p. 152). All species described below are designated as SGCN in the 2012 Arizona SWAP, a designation determined by inadequate information and population vulnerability (see SGCN ranking models) pp. 135-136. The activities described below fall within the routine day-to-day activities performed by Department staff under the statutory and permitted authority to manage and conserve raptors in the State of Arizona.

OBJECTIVES

- Collect data on the status of populations.
- Monitor the health of the populations.
- Conserve breeding attempts of sensitive species.
- Identify habitat use and requirements.

EXPECTED RESULTS AND BENEFITS

- Data on current population numbers and distribution.
- Assessment of vital population demographics.
- Data for land and wildlife management agencies to make informed decisions on project impacts.
- Data on long term population trends including winter count, stop-over areas, and migration counts.
- Threats assessment and abatement.

APPROACH

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

- Monitor Raptor Populations.
 - Using visual observation point surveys, aerial and ground based surveys, monitor raptor breeding populations and their habitats, migration corridors, and winter and summer stop-over areas when appropriate and feasible.
- Conduct demographic studies.
 - Adult identification.
 - Trapping, transmitter deployment, and banding for non-ESA listed species.
- Collect samples for genetic and disease sampling.

- Collect blood sampling and analyses to determine population genetics and to assess contaminants levels for non-ESA listed species.
- Assess impacts of planned projects on all aspects of raptor ecology.
 - Conduct local population censuses and demographic studies at local sites to assess direct and indirect effect of planned projects on raptor species (as described above).
- Implement projects for organochlorine, heavy metal and parasite monitoring.
- Implement projects to monitor and control parasites.
- Salvage/collect addled eggs, eggshells, carcasses, bone, feathers, and other parts, for contaminants analyses and subsequent transfer to the National Wildlife Health Center, the Non-eagle feather repository, and the Western Foundation of Vertebrate Zoology.
- Conduct emergency rescue and salvage efforts.
 - Implement projects to rescue, rehabilitate, and foster raptors.
- Aplomado Falcon (*Falco femoralis septentrionalis*)
 - Assist New Mexico and The Peregrine Fund northern aplomado falcon re-establishment efforts by investigating sighting reports of aplomado falcons in Arizona as established in the Monitoring Plan for the Reestablishment of the Northern Aplomado Falcon in New Mexico and Arizona (USFWS 2006).
- Peregrine falcon (*Falco peregrinus*)
 - Continue to implement the 5-year post-delisting monitoring protocol using visual observation point surveys for the statewide non-urban breeding population as described in the Monitoring Plan for the American Peregrine Falcon (USFWS 2003).

Species Reintroduction and Stocking – Native Species Restoration - Translocation

- Provide oversight for, and coordinating with, captive breeding programs for possible repatriation of species with unsustainable numbers or extirpated populations.
- Burrowing owl (*Athene cunicularia*)
 - Coordinate and monitor burrowing owl artificial nest sites for productivity and nest site fidelity statewide.
- California Condor
 - Coordinate and implement voluntary lead reduction efforts within condor range, including hunter outreach efforts and non-lead ammunition incentive programs when feasible.

Create, Restore or Enhance Habitat and Natural Processes – Fish and Wildlife Habitat Structures – Nesting Improvements

- Rebuild and relocate nests for increased productivity and management purposes.
- Establish artificial nest boxes in suitable habitat for appropriate species, in cooperation with private property owners and government agencies.

Outreach – Recruitment and Retention Activities – For Wildlife Watching

- Implement a peregrine falcon public relations and outreach program by placing artificial nest boxes with internet cameras on high rise buildings in downtown Phoenix.

Note – Outreach will not consist of more than 10 % of this sub-projects budget.

LOCATION

Statewide in Arizona, in areas of Nevada, California, and Mexico bordering Arizona.

TIMELINE

Annually – Year-round.

BUDGET

\$51,750

PERMIT AUTHORITY

- USGS Federal Bird Banding Permit 06613.
- Migratory Bird Treaty Act Permit MB680918-0.
- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's 10(a)(1)(A) permit.
- 10(j) authorities.

SUB-PROJECT 4. BURROWING OWL TRANSLOCATION

NEED

Burrowing owls populations are experiencing a range contraction and one reason is increasing development causing a loss of nesting habitat. To counteract this loss, land and wildlife managers are researching and implementing the construction artificial burrows and translocating displaced owls in adjacent protected habitat. However, success of this effort varies due to the difficulty of creating artificial habitat that mimics natural nesting habitat selection. In addition, the exponential loss of nesting habitat in the metropolitan Phoenix and Tucson areas has created an overburdening demand on finding protected nesting habitat in the Sonoran Desert. The Department's Ben Avery Shooting Facility (BASF) is the perfect place to conduct a controlled experiment on habitat manipulation to attain suitable occupancy conditions for the owls. In addition, the BASF will also serve as a protected Sonoran Desert habitat for a translocated population of owls. For this SGCN taxon (Tier B), all activities outlined in the Approach, below, can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP p. 135-136.

OBJECTIVES

- Identify burrowing owl habitat requirements at artificial translocation sites by testing various vegetation clearing parameters to achieve sustained occupancy.
- Once identified, prescribe the vegetation clearing parameters to all artificial translocation sites statewide.
- Incorporate the vegetation clearing parameters into all future artificial translocation site construction.

EXPECTED RESULTS AND BENEFITS

- After a few years of monitoring, we will be able to identify the vegetation clearing distance burrowing owls require to inhabit an area.

- We can then use this information to manage currently unoccupied artificial translocation areas to improve the quality of the habitat for burrowing owls.
- We could also ensure that any new artificial translocation areas are constructed with the required habitat preferences.
- By increasing the success of released/displaced owls, proper translocation techniques will help to prevent further burrowing owl population declines while still allowing development to occur.

APPROACH

Data Collection and Analysis – Techniques Development – Fish and Wildlife Research, Survey, and Management Techniques

- Release burrowing owls obtained from rehabilitation facilities into artificial burrows with varying vegetation clearance protocol within the Ben Avery Shooting Facility.

Data Collection and Analysis – Research, Survey and Monitoring – Fish and Wildlife Species

- Standard monitoring, which includes occupancy status visits every 30 days during the breeding season, and banding of young to determine dispersal distances, will be employed.
- Adaptively manage and monitor to achieve optimum occupancy rates.

LOCATION

Ben Avery Shooting Facility, Arizona

TIMELINE

Annually – Most activities occurring from December through May.

BUDGET

\$5,750

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 5. ARIZONA BALD AND GOLDEN EAGLE MANAGEMENT PROGRAM

NEED

Although the bald eagle population in Arizona is growing, the risk of loss persists. Human populations, recreational pressures, and development in or near the best breeding habitat are increasing. These factors, combined with natural mortality agents, indicate our attention must remain focused on bald eagles for the near future. Without the identified management programs, essential management actions (i.e. seasonal BA closures), and the attention to habitat, breeding Arizona bald eagles may not retain their current distribution and abundance. Since 1991, the Department has been the Southwestern Bald Eagle Management Committee's (SWBEMC) lead implementation agency for bald eagle management in Arizona. The Department developed the Conservation Assessment and Strategy for the Bald Eagle in Arizona (CAS; Driscoll, et al. 2006) which outlined a

conservation strategy to guide future bald eagle management efforts. This Sub-project is designed, in part, to implement the management strategies outlined in the CAS for the bald eagle in Arizona which maintain a stable and/or increasing bald eagle population that no longer warrants ESA protections.

With the growing concern for golden eagle populations nationally and the revised permitting process for the Bald and Golden Eagle Protection Act, the Southwestern Golden Eagle Management Committee (SWGEMC) was developed to implement a statewide golden eagle conservation program. Initial goals of the SWGEMC are to conduct nest surveys, and begin collection of occupancy and reproductive assessment data. Through this coordinated effort, the Department aims to acquire the biological data and/or create a conservation program adequate to preclude the need to list golden eagles under the ESA in the future. For these SGCN taxa (Tier A and B), all activities outlined in the Approach, below, can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP pp. 134.

OBJECTIVES

- Implement appropriate survey, monitoring and management activities as outlined in the CAS for bald eagles to maintain a stable and/or increasing bald eagle population that does not warrant ESA protection.
- Begin statewide implementation of golden eagle nest surveys, occupancy-reproductive assessments, demographic studies, and coordination of the Southwestern Golden Eagle Management Committee to acquire the biological data and/or create a conservation program adequate to keep golden eagles from becoming an ESA listed species in Arizona.

EXPECTED RESULTS AND BENEFITS

- Provide a direct benefit to eagle population numbers through rescues, rehabilitation, nest rebuilding, parasite control, and fostering.
- Monitor vital population parameters through the collection of basic demographic data including banding, trapping, and visual identification.
- Monitor basic population parameters through identification of nesting sites, occupancy, and reproductive data to allow land and wildlife management agencies to make informed decisions on project impacts.
- Contribute to the nationwide monitoring of long term population trends through winter counts.
- Monitor mortality by salvaging dead eagles, addle eggs, and eggshells.
- Maintain support for any necessary conservation actions essential for addressing any issues by providing clear communication with partners and the public as they arise.
- Provide land and wildlife management agencies the detailed site-specific monitoring data necessary to evaluate the effectiveness of current management actions and the affects of human activities on breeding bald eagles through the Arizona Bald Eagle Nestwatch Program.

APPROACH

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

- Implement projects to rescue and rehabilitate, control parasites, and foster eagles.
- Conduct nest surveys, winter count, and occupancy-reproductive assessment flights via aerial, ground, and boat surveys.
- Conduct demographic studies including adult identification, trapping, transmitter deployment, banding, and blood sampling and analyses to determine population genetics and to assess contaminants levels.
- Coordinate the Arizona Bald Eagle Nestwatch Program.
- Salvage/collect addled eggs, eggshells, carcasses, bone, feathers, and other parts, for contaminants analyses and subsequent transfer to the National Eagle Repository, National Wildlife Health Center, and the Western Foundation of Vertebrate Zoology.

Create, Restore or Enhance Habitat and Natural Processes – Fish and Wildlife Habitat Structures – Nesting Improvements

- Rebuild and relocate nests for increased productivity and management purposes.

LOCATION

Statewide, Arizona, and in areas of Nevada and California bordering Arizona.

TIMELINE

Annually – Most activities occurring from December through June.

BUDGET

\$132,500

PERMIT AUTHORITY

- Bald and Golden Eagle Act Scientific Collecting Permit MB11211A-1
- USGS Federal Bird Banding Permit 06613
- Migratory Bird Treaty Act Permit MB680918-0
- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's 10(a)(1)(A) permit.

SUB-PROJECT 6. REMAINING SGCN GENERAL BIRD SURVEY AND ROUTINE MONITORING

NEED

Approximately 545 species of birds have been documented in Arizona, including roughly 300 species which nest annually in the state. However, of the 145 species that are currently considered SGCN (Tiers A, B, C) in Arizona, only 20 species are monitored sufficiently to determine population trend. This fact is further exemplified when only six of the twelve species of federally listed and candidate bird species in the state are sufficiently monitored. Some of these native birds are rare or at risk from numerous threats such as loss or degradation of habitat, groundwater use, catastrophic wildfires, and invasive exotic species. Additional information is needed for many avian SGCN to determine the best methods to reduce these stressors. However, no single agency or organization has the resources to independently conduct the research or monitoring

needed to entire breadth of avian SGCN in Arizona. Research partnerships are necessary AGFD to maintain an active role in the conservation of a greater number of SGCN, fulfilling coordination and research needs as required to achieve success on a greater scale.

All species described below are designated as SGCN in the 2012 Arizona SWAP, a designation determined by inadequate information and population vulnerability (see SGCN ranking models). AGFD seeks to remedy information gaps with additional monitoring and surveys in cooperation with research partners, thereby achieving SGCN information goals and maintaining partnerships that strive for conservation of avian SGCN.

These research needs are reflected in the 2012 Arizona SWAP through the monitoring objectives provided in pp. 136-137, including monitoring unknown status species (p. 152). Partnerships are emphasized in the SWAP and many for avian conservation (including many of the below SGCN) are reflected in Table 4 (p. 158).

OBJECTIVES

- Determine status of populations and habitats by conducting surveys and monitoring populations.
- Identify management potential for specific sites.
- Identify research needs.
- Identify management activities and recommendations.
- Consult with land management agencies and other resource managers to ensure bird conservation priorities are addressed in planning documents and projects.

EXPECTED RESULTS AND BENEFITS

- Establish long-term population trend data.
- Modify management actions and stressors.
- Statewide bird occurrence and monitoring database.
- Supply information to the USFWS on state and regional assessments of bird populations by using the data to comment on 5-yr status reviews, candidate notice of reviews, ESA Section 7 consultations, HDMS queries, conservation agreements, and progress reports.

APPROACH

Data Collection and Analysis – Research, Survey or Monitoring – Fish and Wildlife Species

- SGCN Bird Species - Survey populations and historical localities for SGCN bird species as needed to determine status or identify conservation opportunities.
- Yellow-billed Cuckoo (*Coccyzus americanus*)
 - Following established survey protocol, participate in coordinated statewide conservation and recovery efforts, including conducting noninvasive call playback techniques.
- California Least Tern (*Sterna antillarum brownii*)

- Participate in coordinated least tern conservation and recovery efforts, including monitoring breeding populations at an unobtrusive distance when appropriate and feasible to determine nesting success.
- Yuma Clapper Rail (*Rallus longirostris yumanensis*)
 - Conduct, coordinate, or otherwise participate in call playback surveys using established national protocol (i.e. Standardized North American Marsh Bird Monitoring Protocol) documenting multiple marsh bird species including Yuma Clapper Rails.
 - When feasible, use call playback surveys in areas subject to channel maintenance during the breeding season, to document occupancy and to monitor changes associated with river management activities.
- Southwestern Willow Flycatcher (*Empidonax traillii extimus*)
 - Following the USGS-USFWS sanctioned protocol (USGS 2010), participate in coordinated statewide willow flycatcher conservation and recovery efforts, including conducting noninvasive call playback surveys when appropriate and feasible.
- Masked Bobwhite (*Colinus virginianus ridgwayi*)
 - Conduct auditory and call playback surveys, inventories, and monitoring research actions in Arizona as permitted by the Department's 10(a)(1)(A) permit.
 - Assist with surveys, inventories, and monitoring research and habitat enhancement actions for masked bobwhite in Arizona and Mexico.
 - Assist the USFWS and México with implementation of recovery activities on the Buenos Aires National Wildlife Refuge as identified by the Masked Bobwhite Recovery Team or described in the Masked Bobwhite Recovery Plan (1995).

Data Collection and Analysis – Database Development and Management – Database Development and Information Systems Operation and Maintenance

- In cooperation with the USFWS, assist in updating and maintaining the willow flycatcher interagency (AGFD, USBR, USFWS, USGS) database with survey and nest data.

LOCATION

Statewide, Arizona

TIMELINE

Annually – Most activities occurring from December through June.

BUDGET

\$6,600

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's 10(a)(1)(A) permit.

PROJECT 7: MAMMAL CONSERVATION AND RECOVERY TOTAL = \$142,250

Principle Investigator – James Driscoll

SUB-PROJECT 1. REMAINING SGCN MAMMAL SURVEY AND ROUTINE MONITORING
NEED

Although many mammal SGCN warrant extensive, species-specific projects to monitor or recover populations, others receive little research attention. Some native small mammals are rare or at risk from threats such as loss or degradation of habitat, catastrophic wildfires, and invasive exotic species. Additional information is needed to determine the best methods to reduce these stressors, as surprisingly little is known about most of Arizona's bats and small mammals - including status, natural history, and distribution. This lack of information contributes to the listing of 60 mammal SGCN (Tier A, B) in Arizona (2012 Revised SWAP, see SGCN vulnerability explanations), which includes 12 bat species and over 30 small mammals. Several of these species are ESA-listed as candidate, threatened, or endangered. This sub-project refers to all SGCN small mammals in the Arizona SWAP (Appendix E) that are not included in sub-projects below. AGFD proposes to conduct necessary community or site-specific surveys to collect basic information on small mammal SGCN populations to determine their status, trends, and potential future research or management needs. All activities outlined below can be tied to stressors (pp. 57-89), actions (pp. 96-113), and information needs and conservation strategies (pp. 137, 140-141) identified in the Arizona SWAP (AGFD 2012).

OBJECTIVES

- Determine status of SGCN species by conducting surveys and monitoring populations.
- Identify management actions for specific sites.
- Identify research needs.
- Consult with land management agencies and other resource managers conservation priorities are addressed in planning documents and projects.

EXPECTED RESULTS AND BENEFITS

- Data on population status and trends.
- Identify factors limiting populations.
- Implement management actions to reduce threats and stressors to populations.
- Establishment of a statewide small mammal occurrence and monitoring database.

APPROACH

Research, Survey or Monitoring – Fish and Wildlife Species Research, Survey or Monitoring – Fish and Wildlife Species

- Bat Conservation and Management Program
 - Survey and monitor bat populations and habitats.

- Identify, coordinate, and participate in interagency surveys, roost surveys, research, habitat and population monitoring, and other field studies including mist netting.
 - Focus surveys to collect data on the following species, habitats, or their communities:
 - Townsend's big-eared bat.
 - Red bats.
 - *Eumops underwoodi*.
 - California leaf nosed bat winter vs. summer roosts.
 - Resurvey roosts of historical Mexican free-tailed bats.
 - Bat hibernacula.
 - Bat migration routes.
 - Estimate colony size by species.
 - Manage specific sites.
 - Implement priority actions identified in the Arizona Bat Conservation Strategic Plan by working with external cooperators.
 - Identify potential threats and management needs at each roost site.
 - Evaluate the effects of management actions.
 - Determine the effects of development projects on populations and habitat.
 - Gather baseline information on winter bat ecology to better assess white-nose syndrome's potential to impact bats in Arizona and to better understand the needs habitat use by bats in the winter.
 - Identify and monitor winter hibernacula.
 - Develop and implement a surveillance plan.
 - Assess the feasibility of other monitoring to collect baseline information to detect population changes.
- Note – This activity is intended to supplement, not duplicate, the work covered under the 2011 Multistate Competitive SWG Grant.*
- Lesser Long-nosed bat (*Leptonycteris yerbabuenae*)
 - Coordinate and participate in simultaneous roost surveys.
 - Provide leadership in Working Group and Recovery Group meetings.
 - Develop and implement management recommendations (i.e. primarily to reduce roost disturbance) and other actions as outlined in the Lesser Long-nosed Bat Recovery Plan (USFWS 1994).
 - Small Mammals Conservation and Management Program
 - Survey populations (using standard survey protocols and excluding pitfall traps) and historical localities for SGCN small mammal species as needed to determine status or identify conservation opportunities.
 - Collect a limited number of specimens, including Hualapai Mexican Voles, from historical and newly identified locations for taxonomic analysis, genetics, research, health assessments. Other ESA species will not be targeted for specimen collection within their known range without prior USFWS approval and permitting.

- Implement recommendations for research and conservation of high priority small mammal species or habitats as identified by the Draft Small Mammal Conservation Plan.

LOCATION

Arizona, Statewide

TIMELINE

Annually – Year-round.

BUDGET

\$65,000

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's 10(a)(1)(A) permit.

SUB-PROJECT 2. BLACK-TAILED PRAIRIE DOG TRANSLOCATION

NEED

Black-tailed prairie dogs were extirpated from Arizona by 1961. Restoring this species is an objective of the Multi-State Conservation Plan for Black-tailed Prairie Dogs, the draft Interagency Management Plan for Black-tailed Prairie Dogs in Arizona, and has been identified as a SGCN in Arizona's SWAP. Habitat modifications, continuous translocations, and monitoring must occur to restore this species to its native habitat. For this SGCN taxon (Tier A) all activities outlined in the Approach, below, can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP pp. 138-139.

OBJECTIVES

- Develop and implement the statewide management plan in support of WAFWA sponsored Conservation Agreements.
- Evaluate reintroduction potential in new areas.
- Identify and implement conservation actions sufficient to meet population objectives without federal listing.

EXPECTED RESULTS AND BENEFITS

- Preclude need to list species under ESA by reaching statewide population objectives.
- Reestablish populations of species in its historic habitat.
- Adaptively manage populations to meet state population objectives while addressing public concerns.
- Finalize a statewide management plan.

APPROACH

Research, Survey or Monitoring – Fish and Wildlife Species Research, Survey or Monitoring – Fish and Wildlife Species

- Monitor the reestablished black-tailed prairie dog populations to determine the growth and expansion of the colony, occupied acreage, and the population density within each colony.
- Recover mortalities for necropsy and disease testing.
- Conduct a mark recapture studies to determine demographic parameters limiting population growth.
- Collect blood or tissue samples for genetic analysis.

Species Reintroduction and Stocking – Native Species Restoration – Translocation

- Reintroduce black-tailed prairie dogs into historic habitats.
- Translocate prairie dogs into suitable habitat in Arizona (including the Las Cienegas National Conservation Area) from stable source populations in New Mexico, Texas, and México.
- Monitor prairie dogs and their habitat immediately following release and up to 10 years post release.
- Monitor for disease in colonies and implement management actions (including dusting) to reduce the occurrence of disease.
- Implement management actions to control populations pursuant to other agreements and the statewide population objectives.

Create, Restore or Enhance Habitat and Natural Processes – Create New Habitat or Natural Processes – Habitat Conversion

- Modify habitat to achieve the statewide goal of 7,100 occupied acres pending NEPA approval.

Data Collection and Analysis – Techniques Development – Fish and Wildlife Research, Survey and Management Techniques

- Develop and implement recommendations and guidelines for adaptive management (including survey, monitoring, research, etc.) of the species and its habitats.

LOCATION

Southern Arizona (specifically Las Cienegas National Conservation Area); New Mexico, Texas, and Mexico

TIMELINE

Annually – Most activities occurring from July through December.

BUDGET

\$47,250

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.

SUB-PROJECT 3. GUNNISON'S PRAIRIE DOG MONITORING

NEED

Gunnison's prairie dogs populations have declined dramatically over the last century and are currently at risk from plague, habitat conversion and development, poisoning, and hunting. Investing in management of the species will maintain the current populations that exist in Arizona, preclude the need to list the species under the ESA, and would fulfill state obligations identified in the Gunnison's Prairie Dog Conservation Plan and the Interagency Management Plan for Gunnison's Prairie Dogs in Arizona. For this SGCN taxon (Tier B), all activities outlined in the Approach, below, can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP pp. 138-139.

OBJECTIVES

- Develop and implement the statewide management plan in support of WAFWA sponsored Conservation Agreements.
- Identify and implement conservation actions sufficient to meet statewide objectives without federal listing.
- Conserve current populations.
- Collect data on populations and habitats.
- Identify research needs.

EXPECTED RESULTS AND BENEFITS

- Population assessment of Gunnison's prairie dogs in Arizona.
- Identification of management approaches to stabilize or increase populations.
- Establishment of a mechanism to identify long-term population trend.

APPROACH

Research, Survey or Monitoring – Fish and Wildlife Species Research, Survey or Monitoring – Fish and Wildlife Species

- Coordinate and conduct statewide surveys to identify and monitor the population's distribution and status.
 - Conduct occupancy surveys every three years.
 - Map colonies determine occupied acreage and assess population fluctuations.
- Monitor the statewide occurrence of disease and implement management actions (including dusting) to reduce the occurrence of disease in colonies.

Species Reintroduction and Stocking – Native Species Restoration - Translocation

- Partner with Wildlife Services, Pest Control companies, and land managers to translocate pest Gunnison's prairie dogs into suitable habitat in Arizona instead of lethal eradication.
 - Evaluate sites and conduct translocations on Apache-Sitgreaves, Coconino, and Kaibab national forests, BLM, State Land Department, Department properties, and private lands.

- Conduct a mark recapture studies to determine demographic parameters limiting population growth.

LOCATION

Northern Arizona.

TIMELINE

Annually – Most activities occurring from May through September.

BUDGET

\$22,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's statewide 10(a)(1)(A) permit.

SUB-PROJECT 4. BLACK-FOOTED FERRET REINTRODUCTION

NEED

The planning and implementation of recovery actions for the ESA listed black-footed ferret, to maintain a free-ranging, self-sustaining population in the Aubrey Valley. For this SGCN taxon (Tier A), all activities outlined in the Approach, below, can be tied to threats, actions, information needs and conservation strategies identified in the Arizona SWAP pp. 137-138.

OBJECTIVES

- Monitor prairie dog densities to determine black-footed ferret prey base adequacy within the reintroduction area.
- Determine the epidemiology of plague and distemper in free-ranging carnivores and other wildlife within the reintroduction area.
- Achieve the reintroduction plan goal of establishing a free-ranging, reproducing population of black-footed ferrets.
- Monitor the reintroduction effort.
- Conduct surveys to identify future potential reintroduction sites.

EXPECTED RESULTS AND BENEFITS

- Data on prairie dog populations and fluctuations within the release area.
- Examine the potential for future reintroduction efforts in other suitable areas (including the Espee Allotment).
- Achieving population levels that contribute to the national recovery of the species.
- Manage populations of both black-footed ferrets, prairie dog populations and their habitat to reduce impacts to local residents.

APPROACH

Research, Survey or Monitoring – Fish and Wildlife Species Research, Survey or Monitoring – Fish and Wildlife Species

- Map Gunnison's prairie dog colonies.
- Monitor and manage for diseases (using methods described by Williams et al. (1991) and other projects endorsed by BFFRIT).
 - Collect blood samples from predators. Use APHIS Wildlife Services to collect samples on the Espee.
 - Implement small mammal trapping .
 - Participate in Oral Sylvatic Plague Vaccine field trial.
 - Dust the burrows to prevent outbreaks.
- Survey other areas for evidence of black-footed ferrets, including Apache, Coconino, Navajo, and Yavapai counties.
 - Identify potential reintroduction sites on the basis of prairie dog colony area, colony juxtaposition, total area of colony complexes, burrow density and land use and ownership.
 - Spotlight and search for bones and tracks as described by Clark et al. (1984) and USFWS (1986), as modified for Arizona conditions by Yarchin et al. (1988). Handle sightings according to protocol (AGFD 1988).

Species Reintroduction and Stocking – Native Species Restoration – Translocation

- In accordance with the black-footed reintroduction plan (Belitsky et al. 1994), release protocol (Van Pelt 1996), and the USFWS-approved annual allocation proposal, propagate, release, monitor, and manage black-footed ferrets populations.
- Translocate wild-born black-footed ferrets from Aubrey Valley release area and release captive bred animals into the Espee reintroduction site.
- If necessary, provide Gunnison's prairie dog carcasses to captive-breeding facilities (e.g., The Phoenix Zoo) for pre-release conditioning .
- Capture black-footed ferrets to determine the health of the individuals.

LOCATION

Northern Arizona (specifically the Aubrey Valley and Espee Allotment in Coconino and Yavapai Counties, Arizona).

TIMELINE

Annually – Year-round.

BUDGET

\$7,500

PERMIT AUTHORITY

- AGFD-USFWS Section 6 Cooperative Agreement.
- Take allowances as authorized under the Department's 10(a)(1)(A) permit.
- 10(j) population.

- Fish and Wildlife Permit number TE163125-1 (issued by FWS Region VI December 13, 2011).

APPENDIX: APPROVED EACS

Project 2. Invertebrate Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020
- M10-07305259: AZ FW-100-P-18 2010-2015 Statewide Terrestrial Survey/Inventory - Game Management Statewide Programmatic (W53-M Game Management Administration / Coordination)

Project 2. Sub-project 1 and 4. SGCN Mollusks and Ambersnails

- Ambersnail Monitoring and Management EAC# M11-03292845

Project 3. Native Fish Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020

Project 3. Sub-project 1. Community Surveys and Research Needs for SGCN Fishes

The following EACs were developed and approved for projects funded with federal funds like SWG, F7, and/or CAP contracts, as well as Heritage:

- Ash Creek Native Fish Translocation EAC# M06-09155613,
- Grapevine Creek-Gila Trout, Gila Chub, and Speckled Dace Establishment EAC# M09-10273614
- Supplemental Stocking of Longfin Dace into Fossil Creek EAC# M07-04172930,
- Mexican Stoneroller Introduction into West Turkey Creek EAC# M07-03230526,
- Addendum Arnett Creek Native Fish Enhancement EAC# M07-06270445,
- Cave Creek Chiricahua Mountains Native Fish Expansion EAC# M08-04011932,
- Yaqui Fish Reintroduction on Bar Boot and 99 Bar Ranches EAC# M09-07074654,
- Black Canyon City Native Fish Refuge Program EAC# M11-02114442,
- Statewide Fisheries Stocking Program Amendment EAC# M11-03315705

Project 3. Sub-project 2. Roundtail, Headwater, and Gila Chub

The following EACs were developed and approved for projects funded with federal funds like SWG, CAP contracts, F23, and/or F7, as well as Heritage:

- Programmatic EAC Stock and Augment Roundtail Chub in the Verde Watershed EAC# M08-07162600,
- Establishment of Native Fish Refugia (roundtail chub population from Clear Creek) on Raymond Wildlife Area EAC# M06-04173721,
- Ash Creek Native Fish Reintroduction EAC# M06-09155613,

- Grapevine Creek-Gila Trout, Gila Chub, and Speckled Dace Establishment EAC# M09-10273614
- Blue River Native Fish Restoration EAC# M10-04120611,
- Addendum to M07-10185125 Gila chub and topminnow to New Mexico DGF EAC# M10-06141604,
- Black Canyon City Native Fish Refuge Program EAC# M11-02114442,
- Collection of roundtail chub from Eagle Creek for use as brood stock EAC# M10-10285010,
- Status, Distribution, and Evaluation of Native Chub Species EAC# M11-04192142,
- Addendum to M08-07162600 Stock and Augment Roundtail Chub in Verde R Watershed EAC# m11-05034326,
- Repatriations of Gila topminnow, desert pupfish, and Gila chub in the San Pedro NCA EAC# M11-06094610,
- Repatriations of Gila topminnow desert pupfish and Gila chub into the Las Cienegas NCA EAC# M11-08160227,
- Blue River native fish restoration EAC# M12-01203453,
- Statewide Fisheries Stocking Program Amendment EAC# M11-03315705

Project 3. Sub-project 3. Big River Native Fishes

- M11-03160244 - Colorado River Fish Monitoring in Glen and Grand Canyons
- M11-06132319 - Shinumo Creek humpback chub amendment
- M07-05291229 - Native Fish Repatriation in Fossil Creek

Project 3. Sub-project 4. Topminnow and Pupfish

Most of the following EACs were developed and approved for projects funded with federal funds like CAP and MSCP contracts or F7, but may involve some SWG-funded personnel or resources to implement with minor roles:

- Muleshoe Ecosystem Native Fishes Augmentation and Translocation EAC# M07-07264244,
- Native Fish Stocking in Fossil Creek EAC# M07-05291229,
- Addendum to Fossil Creek EAC# M07-08311930,
- Larry Creek EAC# M05-082204-32767,
- Bonita Creek Restoration Project EAC# M08-03185632,
- Addendum to Bonita Creek Restoration Project EAC# M08-06090920,
- Cottonwood-Artesian Gila Topminnow and Desert Pupfish Stocking EAC# M10-03045838,
- Mud Spring Gila Topminnow and Desert Pupfish Stocking EAC# M10-03045739,
- Walnut Spring (#392) Gila Topminnow and Desert Pupfish Stocking EAC# M10-03045520,
- Addendum to Desert Pupfish Stocking at Walnut Springs EAC# M08-02222010,
- Tule Creek Desert Pupfish Stocking EAC# M07-08031837,
- Howard and Posey wells EAC# M08-02225046,
- Morgan City Wash (#383) and Chalk Springs Gila Topminnow, Desert Pupfish, Gila Chub, Spikedace, and Loach Minnow Stockings EAC# M08-03121805,
- Cottonwood Spring (Goldfield) Gila Topminnow Stocking EAC# M08-04182236,
- Addendum to Gila Topminnow Augmentation at Mud Springs EAC# M08-09025650,
- Timbucktwo Tank SHA for Topminnow and Pupfish EAC# M08-07291118,

- McDowell Mountain Regional Park Gila Topminnow and Desert Pupfish Stocking EAC# M08-01233057
- Addendum to McDowell Mountain Regional Park Gila Topminnow and Desert Pupfish EAC# M08-05195752,
- Willow Springs Native Fish Project EAC# M07-01291904,
- Utery Mountain Regional Park Gila Topminnow and Desert Pupfish Stocking EAC# M10-05114928,
- Kei Sundt Pond Safe Harbor Agreement EAC# M10-10142543,
- Gila Topminnow and Desert Pupfish Stockings into Ponds within Robbins Butte Wildlife Area EAC# M09-05264246,
- Nina Mason Pulliam Rio Salado M10-02183683,
- Augmentation of Gila Topminnow at Warren Davison's Pond EAC# M09-07220140,
- Yaqui Fish Reintroduction on Bar Boot and 99 Bar Ranches EAC# M09-07074654,
- Audubon Appleton Whittell Research Ranch HQ Pond EAC# M10-10045830,
- Addendum to Gila chub and topminnow to NMDGF EAC# M10-06141604,
- Black Canyon City Native Fish Refuge Program EAC# M11-02114442,
- Phoenix Zoo Topminnow Population Replacement EAC# M11-03183830,
- Repatriations of Gila topminnow, desert pupfish, and Gila chub in the San Pedro NCA EAC# M11-06094610,
- Augmentation of Gila topminnow into Lime Creek and Dutchman's Grave Spring EAC# M11-05113859,
- Amendment to Kei Sundt Pond Native Fish Stocking EAC# M11-06133124,
- Amendment to top-pup Rio Salado Audubon Center EAC# M11-06133021,
- Amendment to Audubon Appleton-Whittell Research Ranch HQ Pond SHA EAC# M11-06133218,
- Amendment to Augmentation of Gila Topminnow at Warren Davison's Pond EAC# M11-06133331,
- Amendment to Timbucktwo Tank SHA EAC# M11-06133635,
- Repatriations of Gila topminnow desert pupfish and Gila chub into the Las Cienegas NCA EAC# M11-08160227

Project 3. Sub-project 5. Loach Minnow and Spikedace

Most of the following EACs were developed and approved for projects funded with federal funds like CAP and MSCP contracts or F7, but may involve some SWG-funded personnel or resources to implement with minor roles:

- Muleshoe Ecosystem Native Fishes Augmentation and Translocation EAC# M07-07264244,
- Native Fish Stocking in Fossil Creek EAC# M07-05291229,
- Addendum to Native Fish Stocking in Fossil Creek EAC# M07-08311930,
- Bonita Creek Native Fish Restoration Project EAC# M08-03185632,
- Addendum to Bonita Creek Restoration Project EAC# M08-06090920,
- Morgan City Wash (#383) and Chalk Springs Gila Topminnow, Desert Pupfish, Gila Chub, Spikedace, and Loach Minnow Stockings EAC# M08-03121805,
- Blue River Native Fish Restoration EAC# M10-04120611,

- Black Canyon City Native Fish Refuge Program EAC# M11-02114442,
- Blue River native fish restoration EAC# M12-01203453,
- Statewide Fisheries Stocking Program Amendment EAC# M11-03315705

Project 3. Sub-project 6. Little Colorado Spinedace

- LC Spinedace Translocation to Grasslands WLA Refugium EAC# M05-041310,
- Reintroduction of LC Spinedace into West Chevelon Canyon EAC# M06-12204134,
- Addendum to LC Spinedace Translocation to Grasslands WLA Refugium EAC#M07-07132645,
- Middle Wallace Pond Renovation; Raymond Ranch WLA EAC# M09-04085038,
- Supplemental Stocking, Monitoring, and Emergency Salvage of LC Spinedace in the East Clear Creek Drainage EAC# M10-05204315

Project 3. Sub-project 7. Virgin River Fishes

- Hassayampa River Preserve Woundfin Reintroduction EAC# M07-02143218
- VirginRiverRotenone_EA-BA10192010_final_508

Project 3. Sub-project 8. Hatchery Propagation and Rearing

The following EACs were developed and approved for projects funded with federal funds like SWG, F7, and/or CAP contracts, as well as Heritage:

- M10-08025232: AZ FW-100-P-18 2010-2015 Statewide Operations and Maintenance Programmatic
- Programmatic EAC Stock and Augment Roundtail Chub in the Verde Watershed EAC# M08-07162600,
- Native Fish Repatriation from Silver Creek Hatchery Big Springs, Walnut Creek, and Billy Creek EAC# M07-08304314,
- Establishment of Native Fish Refugia (LC spinedace population from Chevelon Creek) on Raymond Wildlife Area EAC # M05-100401,
- Establishment of Native Fish Refugia (roundtail chub population from Clear Creek) on Raymond Wildlife Area EAC# M06-04173721,
- Muleshoe Ecosystem Native Fishes Augmentation and Translocation EAC# M07-07264244,
- Native Fish Stocking in Fossil Creek EAC# M07-05291229,
- Addendum to Native Fish Stocking in Fossil Creek EAC# M07-08311930,
- Bonita Creek Native Fish Restoration Project EAC# M08-03185632,
- Middle Wallace Pond Renovation EAC# M09-04085038,
- Ash Creek Native Fish Translocation EAC# M06-09155613,
- Augmentation of Gila Topminnow at Warren Davison's Pond EAC# M09-07220140,
- Shinumo Creek humpback chub amendment EAC# M11-06132319,
- Black Canyon City Native Fish Refuge Program EAC# M11-02114442,
- Collection of roundtail chub from Eagle Creek for use as brood stock EAC# M10-10285010,
- AGFD Operation and Maintenance Statewide Programmatic EAC# M10-08025232,
- Statewide Fisheries Stocking Program Amendment EAC# M11-03315705

Project 3. Sub-project 9. Native Aquatic Conservation to Complement SRP HCP Work

- Horseshoe and Bartlett HCP Research EAC# M10-03174228
- Stock and augment roundtail chub in the Verde Watershed EAC# M08-07162600
- Topminnow augmentation at Dutchman Grave Spring EAC# M05-082602-32767
- Augmentation of Gila Topminnow into Lime Creek and Dutchman Grave Spring, tributaries to Verde River near Horseshoe Reservoir on the Tonto NF EAC# M11-05113859

Project 4. Amphibian Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020
- M10-07305259: AZ FW-100-P-18 2010-2015 Statewide Terrestrial Survey/Inventory - Game Management Statewide Programmatic (W53-M Game Management Administration / Coordination)

Project 4. Sub-project 1. Chiricahua leopard frog

- M09-07012638 - Chiricahua Leopard Frog De-listing Criterion 1: Population and Metapopulation Management
- M08-10145009 - Safe Harbor Agreement for the Chiricahua Leopard Frog in Arizona
- M09-04023742 - Addendum to M08-10145009 Safe Harbor Agreement for the Chiricahua Leopard Frog in Arizona - Addition of New Donor Sites and Incorporating Existing and Future EA Checklists to Enhance Overall Recovery Efforts
- M11-05033928 - Amendment to M09-07012638 Chiricahua Leopard Frog Delisting Criterion 1 Population and Metapopulation Management
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020

Project 4. Sub-project 2. Tarahumara frog

- M10-05170956 - Addendum to EAC 5-5-04 (04) a Proposal to Reestablish Tarahumara Frogs into Big Casa Canyon

Project 4. Subproject 3. Northern leopard frog

- M09-03060208 - Meehl Pond Northern Leopard Frog Refugia
- M09-04085038 - Middle Wallace Pond Renovation
- M05-031610-32767 - Establishment of a Northern Leopard Frog Refugium Population at House Rock Wildlife Area (**requires update**)
- M11-03162434 - Soap Creek Tank No 2 Berm Repair & Northern Leopard Frog Translocation
- M11-12201547 - Amendment to Middle Wallace Pond Renovation for Northern Leopard Frog (**pending**)

- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020

Project 4. Subproject 4. Relict leopard frog

- M11-03292601 Relict Leopard Frog Repatriation to Union Pass Spring, Mohave County, Arizona

Project 4. Subproject 5. Plains and lowland leopard frogs

- M04-111501-32767 - Habitat Restoration and Reestablishment of Lowland Leopard Frogs - Backyard Ponds
- M06-03305416 - Memo and Emails Re: Amending Existing Checklist Lowland Leopard Frog Backyard Pond Project
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020

Project 5. Reptile Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020
- M10-07305259: AZ FW-100-P-18 2010-2015 Statewide Terrestrial Survey/Inventory - Game Management Statewide Programmatic (W53-M Game Management Administration / Coordination)

Project 5. Sub-project 1. Flat-tailed horned lizard

- M10-08022904 - Flat-tailed Horned Lizard Survey, Monitoring, and Movements
- M11-04080957 - Flat-tailed Horned Lizard Occupancy Surveys within the Yuma Management Area on the Barry M. Goldwater Range - West

Project 5. Sub-project 2. Northern Mexican gartersnake

- M10-06045220 - Northern Mexican Gartersnake Monitoring Project
- Biological and Conference Opinion for Federal Funding of Aquatic Inventory, Survey, and Monitoring Activities, and Conservation Activities for Aquatic Species by Arizona Game and Fish Department, 2011-2020

Project 5. Sub-project 6. Sonoran desert tortoise

- M11-03095350 - Long-term Sonoran Desert Tortoise Monitoring
- M10-01260705 - Sugarloaf Desert Tortoise Mark-Recapture and Telemetry Study
- M09-11195244 - Proposal to Assess the Effectiveness of Desert Tortoise Fencing and Crossing Structures Along the State Route 87 Transportation Corridor, Mile Post 204.55 - 205.34

- M10-07135922 - Landscape-Level Habitat Associations and Phylogenetics of Desert Tortoises on Southwestern Arizona Military Ranges managed by the Army, Air Force, and Marines
- M11-04263710 - Desert Tortoise Occupancy Monitoring on the Arizona Army National Guard Florence Military Reservation

Project 6. Bird Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- M10-07305259: AZ FW-100-P-18 2010-2015 Statewide Terrestrial Survey/Inventory - Game Management Statewide Programmatic (W53-M Game Management Administration / Coordination)

Project 6. Sub-project 2. Arizona Coordinated Bird Monitoring

- M11-05180920 - Birds Program Routine Survey and Monitoring

Project 6. Sub-project 4. Burrowing Owl Translocation

- M09-10135529 - Experimenting with Burrowing Owl Translocations to Determine Management Prescriptions on the Ben Avery Shooting Facility

Project 6. Sub-project 5. Arizona Bald and Golden Eagle Management Program

- M10-06070423 - AGFD Statewide Aerial Surveys EAC# (and amendment M10-07023027)
- M11-03031847 – AGFD Bald and Golden Eagle Management Program

Project 6. Sub-project 7. Statewide SGCN General Bird Survey and Routine Monitoring

- M11-05180920 - Birds Program Routine Survey and Monitoring

Project 7. Mammal Conservation and Recovery

- M10-07305024: AZ FW-100-P-18 / CMS - 2010-2015 Business Administration Programmatic
- M10-07305259: AZ FW-100-P-18 2010-2015 Statewide Terrestrial Survey/Inventory - Game Management Statewide Programmatic (W53-M Game Management Administration / Coordination)

Project 7. Sub-project 1. Statewide SGCN Mammal Survey and Routine Monitoring

- M10-02170217 - Lesser Long-nosed Bat (*Leptonycteris curasoae*) Roost Identification and Landscape Movement Corridor Identification Projects
- M11-10191526 - AGFD Western Coordinated Response to White-nose Syndrome in Bats

Project 7. Sub-project 2. Black-tailed Prairie Dog Translocation

- M11-01275201 - Black-tailed Prairie Dog Reestablishment on the Las Cienegas National Conservation Area
- AZ-420-2008-014 - BLM Reintroduction of Black-Tailed Prairie Dogs.

Project 7. Sub-project 4. Black-footed Ferret Reintroduction

- M11-04192807 - Aubrey Valley Experimental Population Area and Espee Ranch: Black-footed Ferret Reintroduction.