

STATE OF ARIZONA

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HERITAGE PROGRAM FY96-97 REPORT  
TO THE ARIZONA LEGISLATURE

Project Year July 1, 1996 to June 30, 1997

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## ACKNOWLEDGMENTS

The assistance of personnel throughout the Arizona Game and Fish Department, and our external cooperators, in preparing this report and conducting the activities reported herein is gratefully acknowledged.

## AMERICANS WITH DISABILITIES ACT COMPLIANCE

The Arizona Game and Fish Department complies with all provisions of the Americans with Disabilities Act. This document is available in alternative format by contacting Deputy Director Thomas W. Spalding, Director's Office, Arizona Game and Fish Department, 2221 West Greenway Road, Phoenix, Arizona 85023-4399 -- (602) 789-3276.

## PROJECT FUNDING

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This Heritage Fund report to the Arizona Legislature is required under, and submitted in compliance with, Arizona Revised Statutes 17-298 (G).

HERITAGE PROGRAM FY96-97 REPORT  
TO THE ARIZONA LEGISLATURE

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## PROJECT COOPERATORS

Animal and Plant Health Inspection Service  
Arizona Department of Agriculture  
Arizona Department of Emergency and Military Affairs  
Arizona Department of Environmental Quality  
Arizona Department of Health Services  
Arizona Department of Transportation  
Arizona Department of Water Resources  
Arizona Interagency Desert Tortoise Team  
Arizona Partners in Flight  
Arizona-Sonora Desert Museum  
Arizona State Land Department  
Arizona State Parks Board  
Arizona State University  
Arizona State University West  
Arizona Wildlife Federation  
Army Corps of Engineers  
Bat Conservation International  
Bureau of Indian Affairs  
Bureau of Land Management  
Brigham Young University  
California Department of Fish and Game  
California Department of Parks and Recreation  
City of Phoenix  
City of Tucson  
Comisión Nacional para el Uso y Aprovechamiento de la Biodiversidad  
Dexter National Fish Hatchery and Technology Center  
Department of Defense  
Ducks Unlimited de Mexico, A.C.  
Environmental Protection Agency  
Fort McDowell Indian Community  
Grand Canyon University  
Instituto de Medio Ambiente y Desarrollo Sustentable de Sonora  
Instituto Tecnológico de Estudios Superiores de Monterrey  
International Association of Fish and Wildlife Agencies  
Lake Mead National Recreation Area  
Malpai Borderlands Group  
Maricopa County Parks & Recreation Department  
Mohave County Parks Department  
National Audubon Society  
National Biological Survey or Service  
National Environmental Policy Act  
National Fish and Wildlife Foundation  
National Park Service  
Natural Resource Conservation District  
Natural Resource Conservation Service  
National Wildlife Refuge  
Neotropical Migratory Birds  
Nevada Department of Wildlife  
New Mexico Department of Game and Fish  
New Mexico State Land Department  
Northern Arizona University  
Partners in Flight  
Preserve Arizona's Wolves (P.A.WS.)  
Protección a la Fauna, A.C.  
Rocky Mountain Elk Foundation  
San Carlos Apache Tribe  
San Diego Zoological Society  
Secretaría de Medio Ambiente, Recursos Naturales y Pesca  
Salt River Pima Indian Community  
Salt River Project  
Southwestern Research Station  
Texas Memorial Museum  
The Arizona Nature Conservancy  
The Hualapai Nation  
The Navajo Nation  
The Peregrine Fund  
The Phoenix Zoo  
The Smithsonian Institution  
Tucson Audubon Society  
University of Nevada, Las Vegas  
University of New Mexico  
University of New Mexico Museum of Southwestern Biology  
University of Arizona  
U.S. Air Force  
U.S. Army  
U.S. Bureau of Reclamation  
U.S. Dept. of Agriculture Animal Damage Control program (now known as Wildlife Services)  
U.S. Fish and Wildlife Service  
U.S. Forest Service  
U.S. Geological Survey  
U.S. Geological Survey Biological Resources Division  
Utah Division of Wildlife Resources  
Utah State University  
Western New Mexico University  
Western Working Group of Partners in Flight  
White Mountain Apache Tribe  
Wildlife Preservation Trust International

HERITAGE PROGRAM FY96-97 REPORT TO THE ARIZONA LEGISLATURE

Report Period: July 1, 1996 - June 30, 1997

Report Prepared: December 19, 1997

HEP: HABITAT EVALUATION AND PROTECTION PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Habitat Evaluation and Protection Project (HEP).

I. JOB SPECIFIC INFORMATION

JOB 1: PROJECT EVALUATION

A. Objective: Facilitate incorporation of fish and wildlife resource needs or features in land and water development or management programs.

B. Approaches and Activities:

1. Collect and inventory fish and wildlife and associated habitat data relative to land and water projects, land management and land planning activities in Arizona.
  - a. We collected and analyzed biotic resource baseline data for use in various project evaluation activities. We continued to cooperate with the Forest Service in the collection of forage and browse utilization data. We continued cooperative monitoring efforts to determine the impact of prescribed fire on wildlife habitat components. We collected data on forage use by elk on the Apache-Sitgreaves National Forests.
  - b. We assimilated biotic resource data from existing references and other database sources, such as Geographic Information System and Heritage Data Management System (Nongame Data Management System).
2. Investigate and determine the effects and impacts on fish and wildlife resources for the selected land and water development projects and land management planning activities in Arizona.
  - a. We coordinated project evaluation activities with various local, state, and federal agencies. We received and reviewed 2994 project-related documents.
  - b. We applied and overlaid project boundary information with known natural resource data collected and assimilated for project evaluation activities.



- c. We determined the level of significance of impacts or losses and the duration of impacts on fish and wildlife resources or habitat.
3. Formulate plans and recommendations for mitigating losses or for enhancement of fish and wildlife or habitat.
  - a. We incorporated information derived from Department standards and guidelines or other management specifications, such as Best Management Practices, into various mitigation, protection and enhancement features.
  - b. We investigated and encouraged development of alternative actions to avoid or minimize fish and wildlife or habitat losses.
4. Coordinate the incorporation and accomplishment of fish and wildlife features in development projects and land management planning activities.
  - a. We proactively coordinated with federal, state, and local agencies and private developers to prevent habitat losses or to modify project activities to minimize or protect wildlife and habitat losses.
  - b. We formally coordinated Department goals and objectives by linking our Strategic Plans with respective land management agency plans.
  - c. We coordinated with the Bureau of Land Management and the U.S. Forest Service in cooperative development, review, and revision of Habitat Management Plans, Resource Management Plans, Land Management Plans, Wilderness Management Plans, Ecosystem Management Plans, or any other resource management plans that affect wildlife and habitat resources.
  - d. We cooperatively developed monitoring plans for project and development activities, when necessary, to ensure compliance with mitigation policies and commitments.
  - e. We increased and promoted public awareness of the Department's habitat evaluation and protection activities in Arizona through dissemination of information.
5. Develop, implement, maintain and revise management strategies and specifications for habitat evaluation, protection, compensation or mitigation.
  - a. We queried other state wildlife resource agencies for existing standards and guidelines for habitat evaluation, protection, compensation or mitigation.

- b. We determined and solicited, from all potential sources, expertise in quantifying fish and wildlife resource and recreational values.
- c. We developed and implemented management strategies and specifications for habitat evaluation, protection, compensation or mitigation activities in Arizona.

## JOB 2: GEOGRAPHIC INFORMATION SYSTEM

- A. Objective: Provide a Geographic Information System for Department use as an effective natural resource data management tool in support of Department functions.
- B. Approaches and Activities:
  - 1. Maintain and enhance the Geographic Information System (GIS) to facilitate storage, retrieval, updating, and analysis of data gathered through inventory and management and for land-use, ownership, and other resource data essential to various Department planning or evaluation and protection activities.
    - a. We maintained existing capability level of current base program level.
    - b. We identified, priority-ranked, and analyzed requirements of programs needing GIS support to meet Heritage and other Department program objectives.
    - c. We determined additional hardware and software needs for Geographic Information System support.
    - d. We determined additional personnel needs for Geographic Information System support.
    - e. We researched and identified networking and data telecommunications needs and options.
      - (1) We networked GIS work stations to allow sharing of GIS databases and computing resources (Local Area Network).
      - (2) We provided access to GIS from remote locations (Regions).
    - f. We built databases (GIS coverages) necessary to accomplish Heritage and other Department goals and objectives.
      - (1) We identified information sources (digitized data, base maps, raw data).

- (2) We identified sources of and collect already digitized data available from other agencies (Arizona State Land Department, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, etc.).
  - (3) We entered data through digitizing, Image Processing of remotely-sensed data and conversion of data imported from other systems.
  - (4) We validated data as necessary through groundtruthing and other methods of verification.
- g. Maintain cooperative and beneficial relationships with other GIS users and the GIS technical community.
- (1) We continued a close working relationship with Arizona Land Resource Information System at Arizona State Land Department to continue access to technical support, training, data coverages, data conversion facility and equipment (electrostatic plotter) not available at our Department.
  - (2) We participated in and promoted the activities of Arizona Geographic Information Council, which encourages coordination of GIS efforts (such as database development) to mutually benefit Council members.

### JOB 3: ENVIRONMENTAL COMPLIANCE

- A. Objective: Ensure habitat protection through environmental compliance and regulation, and monitor implementation and effectiveness of mitigation commitments for various land and water development projects, and land management and planning activities.
- B. Approaches and Activities:
1. Monitor management strategies and specifications for habitat protection, compensation or mitigation and compliance with existing federal, state, and local laws, policies, and cooperative agreements.
    - a. We reviewed habitat files and listed mitigation measures, conditions, stipulations, or other management strategies and specifications for significant projects.
    - b. We developed and maintained a database and system to track existing and future mitigation measures, conditions, stipulations, or other management strategies and specifications.

During this reporting period, documentation and assessment was completed for 65 projects. Assessment was initiated for another 69 projects.

- c. We conducted field and office review to monitor completion, adequacy, and effectiveness of mitigation measures, conditions, stipulations, or other management strategies and specifications in accomplishing wildlife and habitat objectives for significant land and water projects. The mitigation monitoring database was used to identify projects that have not met implementation schedules. A workshop entitled "Restoration Planning, an Analytical Approach" provided a training opportunity for program personnel who routinely develop and review mitigation plans.
  - d. We conducted follow-up coordination with project proponents when mitigating measures, conditions, stipulations, or management strategies and specifications have not been completed or are not meeting Department wildlife and habitat objectives.
2. Research, formulate and implement laws, rules, regulations, policies, management agreements, and enforcement measures that would ensure protection of Arizona's diverse wildlife and habitat heritage.
- a. We queried other state wildlife agencies' existing environmental legislation designed to protect wildlife and wildlife habitat resources.
  - b. We reviewed existing rules, regulations, policies, and management agreements for loopholes and effectiveness in protecting Arizona's wildlife resources and recommend changes or new legislation, where needed.
  - c. We monitored proposed changes in federal rules and regulations published in the "Federal Register: and coordinate a formal Department response when appropriate.
  - d. We coordinated with the Department's Law Enforcement Branch, Rules Coordinator, Assistant Attorney General, and other Department entities to develop new rules, legislation, including criminal and civil sanctions, and implement enforcement measures that would ensure protection of Arizona's diverse wildlife and wildlife habitat heritage.
  - e. We determined and solicited, from all potential sources, expertise in environmental law, including the interpretation of existing laws and regulation.

- f. We provided training to Department personnel in environmental law, state and federal environmental legislation, or other regulatory processes.
3. Provide guidance and oversight to ensure that Department activities comply with federal and state laws or other environmental legislation.
- a. We developed and revised, as needed, an ordered approach or process to ensure Department compliance with federal and state laws or other environmental legislation.
  - b. We provided training to Department personnel in environmental legislation compliance.
  - c. We tracked Department projects and compliance to ensure completion and provide backup documentation when necessary.
4. Other Activities.
- a. Central Arizona Project. Coordination regarding implementation of measures associated with the Biological Opinion for Central Arizona Project operation continued as a major ongoing activity.  
  
Coordination continued regarding implementation of monitoring of the Tonto Creek Riparian Unit, implementation of "goose forage" mitigation agreements at Roosevelt Lake wildlife area, and review of plans and reports for the Tucson Area System Reliability Investigations.
  - b. Lower Colorado River Multi-Species Conservation Program. Stemming from our close work with Arizona Department of Water Resources and other Lower Basin interests to analyze critical habitat for four endangered big river fishes of the Colorado River, we began developing a multi-state conservation program for the Lower Colorado River. We are a member of the Lower Division States/Tribes Endangered Species Steering Committee, which is composed of water and wildlife interests in Arizona, California, and Nevada, and the Department of the Interior (U.S. Fish and Wildlife Service). The Committee has developed a Memorandum of Understanding and a Memorandum of Agreement to develop a Lower Colorado River Species Conservation Program. Agreements have been executed to formalize the Committee's structure and to ensure that monies are advanced by federal and non-federal partners for program development.

- c. Bill Williams River Corridor Planning. We continued to serve on the Bill Williams River Corridor Technical Committee, with technical, administrative, and coordination responsibilities. This Department-initiated interagency committee includes Reclamation, U.S. Fish and Wildlife Service, Bureau of Land Management, Arizona State Parks, Corps of Engineers, and Arizona Department of Water Resources. The Committee's objectives are to develop a coordinated strategy for water management that optimizes benefits to recreation and the areas' valuable riparian, wetland, and wildlife resources.
- d. Wetland and Riparian Protection and Coordination. Wetland and riparian protection continued as major activities. Cooperative efforts to develop multi-objective watershed and river management plans are ongoing on the Big Sandy, Bill Williams, Colorado, Gila, Little Colorado, Salt, Santa Maria, and Verde rivers. A contract was awarded to Arizona State University for development of a "Functional Assessment of Riparian Areas in Arizona." The purpose of this project is to modify existing and/or develop new methodologies to assess whether processes are collectively functioning at a level adequate to maintain habitat values and optimum stream conditions. This contract is based upon a grant from the Environmental Protection Agency.
- e. Glen Canyon Dam Operations. With publication of the Final Environmental Impact Statement, the Cooperating Agencies' standing under the National Environmental Policy Act changed. The Cooperating Agencies and Transition Work Group were replaced by a chartered Federal Advisory Committee, the Adaptive Management Work Group, of which the Department is a member.

II. PROJECT BUDGET.

HERITAGE HABITAT  
EVALUATION & PROTECTION

FISCAL YEAR 1996-97

TOTAL EXPENDITURES = \$1,359,557

TOTAL BUDGET = \$1,500,000

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State Match to the Habitat Evaluation  
and Protection Federal Aid Project

Figure 1. Habitat Evaluation and Protection Project Budget.

THREATENED AND ENDANGERED SPECIES  
HABITAT ACQUISITION  
FISCAL YEAR 1996-97

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TOTAL EXPENDITURES = \$453,566.10

TOTAL BUDGET = \$2,400,000.00

Figure 2. Habitat Evaluation and Protection Project Habitat Acquisition Budget.



IDENTIFICATION, INVENTORY, PROTECTION AND MANAGEMENT (IIPAM)

IIPAM-GS: GRANTS ADMINISTRATION AND STEWARDSHIP PROJECT

This report provides information on all Jobs, Approaches, and activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Grants Administration and Stewardship Project (IIPAM-GS).

I. JOB SPECIFIC INFORMATION

JOB 1: IIPAM GRANTS ADMINISTRATION

A. Objective: Provide administrative oversight and coordination for the Heritage IIPAM Grants Program.

B. Approaches and Activities:

1. Coordinate project activities with cooperators within and outside the Department.

- a. Through the IIPAM-WM Project, we revised the sensitive elements addendum list for the annual external grant Application Manual, for the FY98-99 external grant cycle. The list identifies sensitive species and sensitive habitats that are the funding focus for external grant applications. The 1999 supplement list includes 126 project objectives, addressing 76 sensitive elements (mammals, birds, reptiles, amphibians, native fishes, mollusks and crustaceans, and sensitive habitats).
- b. We revised and updated the Heritage Grants Workshop slide shows.
- c. We revised correspondence format and project administration forms to conform with the new Article 7, Heritage Grant Rules (R12-4-701 through R12-4-712). The management information system created to track IIPAM and Urban Wildlife Grant applications proved adequate for the review and proposal process. Database development for tracking technical review, administration, and payment scheduling was revised to augment the management information system, including job summary reports distributed to the project participants to inform them of their progress and status.
- d. We updated and developed database information for administrative management of all external IIPAM applications and funded projects. These data were used to coordinate Department-wide review of applications,

- coordinate technical oversight of projects in progress, assess project technical and financial status, administer project-closure processing, and distribution of project products.
- e. We conducted technical evaluation of IIPAM project proposals and coordinated project information dissemination within the Department. Technical evaluations of project products were subjected to Departmental peer review. Final project reports were distributed to the appropriate branches and regions, including sensitive data and information that was routed to the Heritage Data Management System.
  - f. We updated forms, databases, and information used for administration of external grants, including technical reviews, correspondence formats and procedures. Formats and procedures were modified for internal technical review for proposal, evaluation, priority-ranking, and approval of inventory, monitoring, management, protection-planning, and enhancement projects.
2. Administer funded grants, including coordination of payments and reporting, technical review, and inspection of project products.
- a. Technical reviews of Heritage grants, and coordination of grant payments and reporting, were conducted on all grants awarded for the current year, and on all open grant projects for the years 1992, 1993, 1994, 1995, 1996, and 1997. In the FY96-97 Heritage Grant Cycle, 44 applications were submitted by eligible publics for the IIPAM Grant-in-Aid funding focus. These applications represented requests for \$1,317,288. Fourteen grants were awarded under IIPAM, for a total \$398,514.
  - b. Administrative functions involving project contractual compliance, payments, and other related project administration were coordinated with Funds/Planning Branch, and were detailed in a Performance Report.
  - c. The remaining funded 1992 and 1993 projects were completed in FY96-97. All but four of the 1994 projects have been completed; two are due to close in the 1997 calendar year. The 1995 funded projects are now coming due; two have been completed and closed. The 1996 and 1997 projects are in progress.
  - d. Compliance verification for all funded 1996 external IIPAM projects was met. Ninety percent of the awarded funding was paid to the respective project participants. Compliance verification for all funded 1997 external IIPAM projects is currently under review; funds will be available for release in the forthcoming fiscal year as compliance verification is met.

3. Maintain auditable project records and files.

All 1992 and 1993 projects have been closed; the project files are undergoing archive processing. Auditable files for the 1994 through 1997 external IIPAM projects are maintained and updated by the Heritage Grants and Donation Funds Supervisor. These files are housed in Game Branch.

4. Prepare, publish, and present annual performance reports and other professional and popular publications on activities and results under this Job.

The Annual Work Plan, Heritage Program Annual Performance Report, this report, and contingent intra-Departmental reporting completes this activity for the FY96-97.

JOB 2: STEWARDSHIP

A. Objective: Maintain and enhance wildlife habitat on private and public lands.

B. Approaches and Activities:

1. Develop stewardship agreements with private land owners and land management agencies to enhance wildlife habitat, wildlife populations, and other sensitive elements.

- a. Nine stewardship projects were implemented this year. In addition, the Arizona Habitat Partnership Committees (HPCs) continued to provide a forum for public involvement in identifying big game habitat management concerns and recommending solutions before these concerns become problems. A new local HPC was established in Kingman, bringing the total number of active HPCs to nine. At the June meeting of the statewide HPC, 40 proposed projects were prioritized for funding with proceeds from big game special tags and big game license donations.

Habitat Branch assisted Regional and Game Branch efforts to develop stewardship agreements by: coordinating legal review of draft agreements by the Assistant Attorney General to ensure compliance with appropriate laws and regulations, and review of draft agreements through the Department's Environmental Assessment Checklist process for compliance with natural resource and cultural resource laws and regulations; presenting draft agreements to the Arizona Game and Fish Commission for review and approval; and drafting final agreements.

Region I personnel coordinated with many private landowners to discuss the potential for habitat enhancement projects through the Stewardship Job. As a result, five stewardship agreements were finalized, and another one was renewed for three years. Elk special tags proceeds funded purchase of seed and fertilizer for these agreements, which allow continued elk access to more than 1500 acres of private pasture. Progress on the Hi-Point Well/O'Haco agreement included installation of a generator and engineering for a 100,000 gallon storage tank. The Arizona Water Protection Fund awarded a grant of \$78,000 to help fund the High Point project. Regional personnel also continued testing electric fence as a device to protect private land resources (e.g. irrigated pastures, crops, orchards) from big game impacts. A video describing the project was produced for the *Arizona Wildlife Views* television series. Other activities in Region I included providing PVC pipe for elk crossings and salt to private landowners and grazing permittees on public lands to reduce impacts by elk on fences and livestock salting areas. Regional personnel, other agency personnel, and private volunteers installed more than 100 PVC pipe elk crossings.

In Region II, a stewardship agreement avoided construction of an elk-proof fence that would have been a barrier to elk movement adjacent to a golf course. The agreement enabled construction of a fenced corridor so elk could continue movement through the area without damaging nursery stock on the private land.

In Region III, seven dirt tanks that provide big game water in Game Management Unit 17 were sealed with bentonite to improve storage capability. Cost-share participation from Cross-U Ranch and the Prescott Habitat Partnership Committee enabled timely completion of the project before winter rain filled the tanks. A collection agreement with Prescott National Forest enabled transfer of \$4000 in pronghorn special tag funds for the Cienega controlled burn. Three new water developments were completed in Game Management Unit 10 for mule deer, elk, and bighorn sheep using special tag funds. Special tag funds administered through the Stewardship Job also supported a telemetry study and infra-red sensing survey of the elk herd in the Hualapai Mountains.

In Region IV, a stewardship agreement to protect sensitive riparian habitat was developed with Tres Alamos Ranch, Yavapai County. The agreement involves fencing a spring and road closures. Another agreement provided a seasonal food plot for migratory game birds in Yuma County.

In Region V, we completed a well, storage tank, and pipeline for the Rosewood Tank project, which included development of a perennial water source to protect leopard frog habitat. IIPAM funding also continued to support development of waterfowl habitat improvement projects for two farms in Cochise County. The Region also coordinated with Habitat Branch and Game Branch to continue development of a stewardship agreement with property owners adjacent to Cluff Ranch.

In Region VI, collection agreements were finalized with the Payson Ranger District, Tonto National Forest, for Mesa, Walnut, Horse, Butcher, Pine, and Dry Dude burns. Two of the burns were implemented on 2000 acres and the others are scheduled for completion during winter 1997-98. Elk special tag funds were also used for purchase of supplies for additional monitoring cages to be located throughout the Ranger District.

- b. In addition to Heritage funding, stewardship agreements developed under this Job were partially supported by Job 8, W-53-M funding through the Pittman-Robertson Federal Aid in Wildlife Restoration Act.
2. We provided technical assistance to other agencies regarding habitat management techniques and, when appropriate, developed agreements through Arizona's Habitat Partnership Program and the U.S. Fish and Wildlife Service Partners for Wildlife Program.
3. We administered master agreements with species-specific sportsman's groups, which receive Big Game Special Tags and update agreements. These agreements pertain to the activities addressed above.
4. We coordinated development and implementation of agreements and Big Game Special Tag projects with Development Branch and Field Operations staff.

## IIPAM-LW: LANDS AND WATER PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Lands and Water Project (IIPAM-LW).

### I. JOB SPECIFIC INFORMATION

#### JOB 1: LANDS AND WATER RIGHTS ADMINISTRATION AND ACQUISITION

A. Objective: Protect fish and wildlife habitat through real property management, acquisition, land leases and exchanges, creation of rights-of-ways, establishment of conservation easements, and development of special-use agreements.

#### B. Approaches and Activities:

##### 1. Evaluation of methods of protection.

Lands offered to the Commission are evaluated through the Land Protection Evaluation Process, which was revised April 18, 1994. The Commission approved purchasing conservation easements where appropriate; several offers have been received. Draft Conservation Agreements were developed and submitted to the Arizona Attorney General's office for review and approval.

##### 2. Habitat protection through acquisition methods.

a. The Department completed purchase of the Whitewater Draw Wildlife Area property, near McNeal (Cochise County), through a combination of Heritage, Federal Aid, and Waterfowl Conservation funds. The property consists of 1448 acres, including a pond/wetland area of up to 650 acres. It is an important roosting site for sandhill cranes and shorebirds. In accordance with the Relocation Assistance and Real Property Acquisition Policies Act of 1970, assistance was given the previous owners in moving from the site.

Field elevation surveys were completed for water quantity calculation for the wetland/playa at Whitewater Draw Wildlife Area. The data were used to compute verifiable water storage volumes claimed to "amend" the permit acquired with the land acquisition. An amendment for increased volume of the Department's surface water permit on the seller's property at Whitewater Draw was submitted for consideration and processing. All groundwater water right transfer documents (10 wells) were completed for the Wildlife Area.

- b. A 60 acre parcel adjacent to Quigley Pond Wildlife Area was placed in escrow; purchase should be completed in FY97-98. This parcel has been incorporated into the Quigley Pond Wildlife Area Management Plan.
- c. A 610 acre parcel along the Gila River that has been used as a mitigation site for flood control projects was leased, pending acquisition under a Resource and Public Purposes patent from the Bureau of Reclamation.
- d. A 320 acre parcel at Arlington continues to receive protection through a commercial lease from the State Land Department.
- e. Permanent easement applications for four Department Wildlife Areas were completed and mailed to the appropriate U.S. Forest Service Supervisor's office to meet the Public Law 99-545 deadline of December 31, 1996. These "Agricultural Irrigation and Livestock Watering System Easements" (a.k.a. "ditch bill" easements) will be recorded in each appropriate county and will be issued by each respective Forest at no cost (fee) to the Department.
- f. Other activities included biological and feasibility reports and investigation of water rights on additional proposed property acquisitions. Eighteen properties, in addition to those referenced above, were evaluated for possible acquisition.

## JOB 2: LANDS OPERATION AND MAINTENANCE

- A. Objective: Operate and maintain Heritage Fund properties at sufficient performance levels to protect investments, conserve natural resources, and provide public recreation opportunities.
- B. Approaches and Activities:
  - 1. Operations.
    - a. Management Plans were completed for all Heritage Fund properties owned or managed by the Arizona Game and Fish Commission, including: four recent acquisitions (Wenima, Sipe White Mountain, Upper Verde River, and Whitewater Draw), as well as Powers Butte (Robbins Butte) and Cluff Ranch Wildlife Areas.
    - b. FY97-98 budgets were prepared for two new properties acquired with Heritage funds: the Upper Verde River properties in Region III, and the Whitewater Draw property in Region V.

- c. Environmental Assessment Checklists and State Historic Preservation Office clearances were prepared and approved for maintenance at Sipe White Mountain Wildlife Area and Wenima Wildlife Area.
  - d. We conducted acquisition and start-up activities associated with the purchase of Whitewater Draw Wildlife Area.
  - e. We completed a report on farming practices at Powers Butte (and nearby Robbins Butte) Wildlife Area.
  - f. At Cluff Ranch Wildlife Area: Education Branch held a Bat Workshop for educators; Region V presented a Bat Training Workshop for Regions I and V; Pond 3 was surveyed for southwestern willow flycatchers (none were found); Pond 1 was surveyed for salamanders (only non-native subspecies were found); and one western box turtle was located and marked for a Region V study.
  - g. Operational activities were conducted as planned at Powers Butte Wildlife Area. We conducted plantings and vegetation maintenance activities, including fall planting of about 51 acres of barley and 25 acres of alfalfa. Alfalfa was added to the crop rotation to produce soil enhancement and weed control effects. Spring crops included 7 acres of corn, 31 acres of Sudan grass, 10 acres of grain sorghum, and 12 acres of safflower/sunflower mix. Revegetation plantings were maintained, along with pond and marsh habitat features.
2. Maintenance.
- a. Various maintenance projects were completed for Sipe White Mountain Wildlife Area and Wenima Wildlife Area.
  - b. At Cluff Ranch Wildlife Area, catchable-sized trout were stocked into Pond 3 and weeds were "harvested" to assist with fish management.
  - c. A fire at Robbins Butte Wildlife Area on January 2, 1997 destroyed a shop building housing equipment assigned to Powers Butte Wildlife Area. A claim to Risk Management for losses incurred in the fire is pending.
3. Development.
- a. A new boat ramp and public toilets were installed at Pond 3 at Cluff Ranch. Documentation was started for a stewardship project at Pond 2, repairs for the water transfer ditch from Pond 3 to Ash Creek, a new boundary fence around Cluff Ranch, and repair of the pipeline.



4. Enhancement.
  - a. We identified eligible activities and opportunities for which future project scoping and funding are required.

#### JOB 3: HERITAGE DATA MANAGEMENT SYSTEM

A. Objective: Maintain a sensitive species management information system that facilitates storage, retrieval, updating, and analysis of data gathered through inventory and other management activities.

B. Approaches and Activities:

1. Database maintenance. Element occurrence information was gathered from a variety of sources and entered into the Heritage Data Management System (HDMS). HDMS staff maintained and updated procedures for identifying and extracting sensitive-element data from inventory, monitoring, and management projects conducted by agencies, institutions, and others.
2. Data sharing and associated training. HDMS, Regional, and Phoenix Habitat Program staff apprised current and potential cooperators of opportunities for cooperative data management, outputs, and analyses. HDMS staff trained Department and cooperator personnel in conventions and techniques for recording, providing, and using element occurrence and status information.
3. Database subsets and associated training. Element occurrence, status information, and HDMS data subsets were provided to Regional Habitat and Nongame Branch personnel for project evaluations and baseline data for surveys. Regional HDMS databases and desk-top mapping files were updated quarterly to facilitate timely assessment of sensitive elements that might be affected by an ever-increasing number and variety of projects statewide. Refresher and orientation training on the use, limitations, and security of HDMS database subsets was also provided.
4. Data dissemination. We conducted a workshop and provided associated reference materials with several National Forests (see below), and participated in an Education Branch workshop for teachers on Arizona bats.

We drafted a set of "Data Security Guidelines" that is under internal review.

5. *Wildlife of Special Concern in Arizona*. HDMS staff provided comment and review for the list in general, for listing criteria, and for the listed species.

6. Interagency activities. We conducted interagency activities within the frameworks of 1) Challenge Cost-Share Agreements with three National Forests in Arizona, 2) an Interagency Agreement with the Arizona Department of Agriculture, and 3) a special status species information sharing project with the U.S. Forest Service Southwestern Region Office. In these projects we: conducted workshops, provided and updated limited subsets of data, and prepared a variety of reference materials on special status species. FY96-97 workshop related activities also included cooperatively developing and conducting a workshop with educational and reference materials on lesser known ecosystems, their relationships to wildlife, and associated special status plants on the Coconino and Prescott National Forests.
7. Ecoregional planning. We participated with other Department entities in The Nature Conservancy-initiated Arizona/New Mexico Mountains Ecoregional planning effort. We contributed biological diversity data and helped organize and conduct experts workshops on identification of areas of high diversity within the ecoregion.
8. Status Designation Notebook. We updated our "Status Designations" notebook, a reference listing each special status biological element in Arizona, together with its state, tribal, federal, and Mexican status designations.
9. Species lists. Other activities included compiling up-to-date lists of special status elements from the HDMS database for use by private and governmental project proponents during project planning, and by Department Wildlife Managers and Habitat Specialists in comprehensive reviews and evaluations of proposed projects.
10. Species abstracts. HDMS also continued to prepare and update brief summaries of current information and references from scientific literature, agency reports, and knowledgeable individuals for selected special status biological elements. Various species abstracts were provided to Department personnel, National Forests, New Mexico Department of Game and Fish, and others.
11. Map production and associated training. We designed and produced a variety of maps in Geographic Information System format to accompany most HDMS projects. Expansion of desktop mapping to include Map Info and Arc View software and color-printing capabilities increased our productivity and efficiency. These mapping capabilities and training in their use were also provided to the Regional offices. We continued to upgrade our database, report-writing, and mapping software to increase our productivity and efficiency and improve product quality.

IIPAM-WFR: WILDLIFE AND FISHERIES RESEARCH PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Wildlife and Fisheries Research Project (IIPAM-WFR).

I. JOB SPECIFIC INFORMATION

JOB 1: ADMINISTRATION AND COORDINATION

A. Objective: Effective administration of the research component of IIPAM.

B. Approaches and Activities:

1. Administer the Research portion of IIPAM in a professional, effective manner. This includes: project coordination with other work units, proposal review, participation on grant review committees, and monitoring and management of projects completed under auspices of the Research Narrative.
  - a. During this project year, we participated in project proposal and completion report review, provided administrative oversight to several research projects completed under auspices of the Research Program Narrative, and participated in external grant proposal evaluation.
  - b. We completed a report on a five-year health assessment of the Sonoran population of desert tortoises. It provides a baseline for many health-related physiological values used to predict health status of free-ranging populations of desert tortoises in the Sonoran desert.
  - c. We evaluated select aspects of competition and predation between the introduced rainbow trout and the Little Colorado River spinedace, to help in recovery of the native spinedace throughout its range.
  - d. We reviewed and provided constructive criticism on various proposals and final reports.

JOB 2: WILDLIFE AND FISHERIES RESEARCH

A. Objective: Conduct wildlife and fisheries research.

B. Approaches and Activities:

1. Provide technical guidance to biologists working in Mexico on population and habitat use studies on the endangered Sonoran pronghorn in the State of Sonora.
  - a. We consulted with biologists from Mexico on aspects of pronghorn research in Sonora. In addition, we assisted in preparation of a manuscript describing the management and research program for Sonoran pronghorn that will be published in the proceedings of a recent Pronghorn Workshop.
2. Conduct field-based research on desert tortoises in the Sonoran Desert to collect baseline information on various health indicators that can be used to assess health status of desert tortoise populations.
  - a. We captured and sampled free-ranging desert tortoises in two study areas: near Florence, and the Barry M. Goldwater Range. Various blood and bacteria samples were collected and submitted to appropriate laboratories for evaluation. These data were incorporated into reports as required.
  - b. We completed a final report on the desert tortoise health study.
3. Conduct field-based research on the Little Colorado River spinedace.
  - a. Conduct field assessments of habitat use by Little Colorado spinedace and trout.

Habitat data were collected as planned. Analyses indicated a high degree of overlap in habitat use between the rainbow trout and Little Colorado River spinedace. Analyses also indicated that habitat at sites where both species co-occurred was different than that where spinedace occurred alone. Field observations of microhabitat use were initiated in May and will continue into the next reporting period until turbidity precludes observation.
  - b. Conduct diet analyses for trout and Little Colorado River spinedace.

Thirty-five spinedace and eight rainbow trout were captured in July 1996 for diet analyses. Preliminary viscera analyses indicated diets of the two species overlap, but most of the diet consisted of insects that have not been identified.
  - c. Collect and analyze Little Colorado River spinedace to assess health status.

All fish collected were assessed to be healthy; no differences in health were found between spinedace collected in areas occupied by trout and those collected where trout were absent.

- d. Monitor trout dispersal in Nutrioso Creek, from the dam to 7000 m below Nelson Reservoir, and in the Little Colorado River upstream from Lyman Lake.

Sampling of trout dispersal in Nutrioso Creek was completed as scheduled. No trout were sampled in the Little Colorado River above Lyman Lake.

4. Conduct field-based research on Mt. Trumbull regarding the effects of forest management practices on wildlife.
  - a. Conduct field assessments of habitat use and abundance of reptiles and amphibians, mule deer, squirrels, and wild turkeys.

We installed 42 pitfall arrays during May and June to capture amphibians and reptiles. Amphibian and reptile species-presence data collection began in June and continued through this period. Vegetation data were collected at eight of the arrays and will continue until mid-September of the next reporting period.

Seven mule deer does were collared within the study area. Animals were located from the ground and the locations were recorded on maps and in a Global Positioning Satellite file. Habitat data collection will be delayed until the coming reporting period. Additional mule deer will be captured in the next reporting period.

No turkeys have been collared to date, although baits were placed and monitored from December 1996-March 1997. Efforts to capture the required number of birds will continue into the next reporting period.

- b. Quantify vegetation near pitfall arrays, and mule deer and turkey locations.

Data collection on the vegetation around the pitfall arrays was initiated. Data collection around the mule deer use sites will occur in late summer/autumn of the next reporting period.

## IIPAM-WM: WILDLIFE MANAGEMENT PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Wildlife Management Project (IIPAM-WM).

### I. JOB SPECIFIC INFORMATION

#### JOB 1: ADMINISTRATION AND COORDINATION

A. Objective: Provide administrative oversight and coordination for the Heritage Wildlife Management Project.

B. Approaches and Activities:

1. We coordinated project activities with cooperators within and outside the Department, in regard to: project design and proposal, database management, spatial data analysis, quality assurance, motor pool and logistical support, annual work plans, management issues and activities, and Total Quality Leadership principles.
2. We maintained project records and files as required for administrative and project oversight purposes. These include budget and expenditure information, personnel files, and internal and external coordination records.
3. We drafted, edited, and/or approved various project-related documents, including briefing and position papers, other internal and external correspondence, agreements, contracts, plans, reports, and reviews of various grant proposals (e.g. Arizona Water Protection Fund Grants, International Association of Fish and Wildlife Agencies Administrative Grants, Partnerships for Wildlife Grants). Approvals were handled at levels appropriate to specific issues and consistent with delegated authorities.

#### JOB 2: IDENTIFICATION

A. Objective: Identify elements of natural diversity on which to focus inventory, monitoring, research, and other management activities, and protection-planning priorities.

B. Approaches and Activities:

1. We evaluated sensitive-species and habitat lists and listing criteria; gathered information for status reviews; developed study designs and statistical analyses; investigated improvements in remote sensing technology; exchanged information with agency biologists, museum curators, academicians, conservation activists, and other

knowledgeable individuals; attended professional meetings, conferences, and symposia; and participated in working groups and Recovery Teams.

We conducted a Diversity Review of the status of Arizona's wildlife, and the habitats in which they occur. We also completed a Candidate Species Status and Distribution project.

We drafted a list of *Wildlife of Special Concern in Arizona* and conducted several rounds of public review. We also revised the Heritage Grant Program list of Sensitive Species and Habitats for the FY98-99 grants cycle.

2. We provided sensitive species data from surveys, literature searches, technical reports, review of annual reports for Scientific Collecting Permits, professional contacts, and incidental observations to the Heritage Data Management System for use in project evaluation.

### JOB 3: INVENTORY, MONITORING, AND MANAGEMENT

A. Objective: Inventory, monitor, and manage elements of natural diversity.

B. Approaches and Activities:

1. We gathered pertinent information from agency files, published and gray literature, libraries, museums, collections, photographs and other sources commonly used in scientific investigations.
2. We determined element distribution by conducting field inventories, focusing on sensitive species and sensitive habitats, and elements of natural diversity that may be candidates for such status. Projects included:
  - a. Fall Fish Count. This project was terminated because U.S. Fish and Wildlife Service was unable to provide its committed share of funding.
  - b. Arizona Breeding Bird Atlas. We completed the fourth and initiated the fifth field season for this project. Field data were reviewed and entered into a database. We produced and distributed an annual progress report and periodic newsletters, and conducted training workshops for Atlas volunteers.
  - c. Neotropical Migratory Birds. We again coordinated Arizona Partners in Flight, a voluntary cooperative effort among government agencies and other entities to conserve neotropical migratory birds and their habitat.

- d. Rail Surveys. We conducted surveys in the Yuma area along the Lower Colorado River, the Gila River, and parts of Lake Havasu.
  - e. Bat Management. We conducted several survey, monitoring, and management projects in cooperation with other agencies and organizations.
  - f. Small Mammals of North Kaibab. No activity.
  - g. Spotted Bat on North Kaibab Ranger District. We continued this radiotelemetry study of spotted bats.
  - h. Sonoran Pronghorn Range-wide Survey. We participated in Sonoran Pronghorn Core Work Group meetings to oversee management and research activities in the United States, and carried out said activities.
  - i. Statewide Riparian and Wetlands Monitoring. In 1992, the Arizona Game and Fish Department was directed through the "Waters - Riparian Protection Program" (Arizona Revised Statute 45-101) to study Arizona's riparian areas. This year, we completed the last phase of that project: an accuracy assessment for spatial extent and classification of riparian areas along perennial streams, and detailed the methodologies and the limitations in application of existing remote sensing technologies to mapping these narrow, linear vegetation communities that occur along permanent and intermittent streams.
  - j. White Mountains Wetlands Microsites. We developed an inventory protocol and priority ranked a list of spring sites in the White Mountains to be surveyed for faunal and floral characteristics.
  - k. Region VI Wildlife Area Inventories. We conducted baseline inventories of four Wildlife Areas and developed species-occurrence lists.
3. Determine element status and population trends by monitoring sensitive species, and sensitive habitats and other biotic communities.
- a. Kanab Ambersnail. We participated in interagency monitoring at Vaseys Paradise, in Grand Canyon, and continued studies on population fluctuations, behavior, life history, genetic variation, habitat use, effects of flooding, and establishment of additional wild or captive refugium populations.
  - b. Big River Fish Management. We sampled portions of the Verde River, Roosevelt Lake, and upper Salt River to monitor reintroduced Colorado



squawfish and razorback suckers. We also sampled Lake Mohave to monitor bonytail chubs and razorback suckers.

- c. Native Fish Survey of Big Sandy, Hassayampa, and Santa Maria Rivers. We surveyed 35 sites on 10 streams to compare relative abundance and distribution of native fishes to previous surveys.
- d. Native Fish Survey of the Burro Creek Drainage. We surveyed 26 sites to compare relative abundance and distribution of native fishes to previous surveys.
- e. Ranid Frogs Management. We continued statewide surveys, monitoring, and management (including translocations) of native ranid frogs.
- f. Desert Tortoise Management. We continued statewide surveys, monitoring, and management of the desert tortoise.
- g. Bald Eagle Management. We again chaired the Southwestern Bald Eagle Management Committee, through which we coordinated and carried out the following activities: Arizona Bald Eagle Nestwatch Program; nest search; occupancy-reproduction assessment; banding fledglings; winter count; providing information to the public and cooperating agencies via a periodic newsletter, press releases, interviews with local television and radio stations, various magazine articles, brochures, technical reports, and presentations; and collecting fish and egg shell remains for contaminants analysis.
- h. Northern Goshawk Demography. At a workshop sponsored by White Mountain Apache Tribe, we presented survey and monitoring techniques to prepare workers for the Tribe's 1997 goshawk surveys. We also surveyed the Baca Ecosystem Analysis Area, and collected the fourth (final) season of field data for the Goshawk Demography Study on the Sitgreaves National Forest.
- i. Peregrine Falcon Monitoring. We monitored the status of 30 peregrine eyries this year, met with cooperators to review recovery goals, and distributed a questionnaire to states in the Rocky Mountain/Southwest Recovery Region seeking current information for use in a status determination.
- j. Southwestern Willow Flycatcher. Statewide surveys were coordinated and conducted again, and we also conducted two survey training workshops, for cooperating agencies and consulting firms.

- k. Hualapai Mexican Vole Management. We surveyed various historical occurrence sites in the Hualapai Mountains sites for voles.
  - l. Jumping Mouse and Water Shrew. We completed surveys in the White Mountains to determine distribution and relative abundance, and coordinated with Arizona State University and the White Mountain Apache Tribe to develop a more comprehensive survey strategy for east-central Arizona.
  - m. Mount Graham Red Squirrel Management. We coordinated midden surveys with cooperators, calculated population estimates, and developed joint press releases with the Coronado National Forest to report the estimate. We also participated in a Study Committee and interagency meetings to: coordinate and fund research; establish standards and guidelines for managing the midden database; and review and implement the twice-annual midden survey.
  - n. Additional Monitoring Activities. We surveyed Sycamore Creek (Santa Cruz County); monitored the Virgin River, in conjunction with the Virgin River Fishes Recovery Team; and monitored Lousy Canyon and Larry Creek.
4. Implement element-specific management actions, in accordance with approved plans, standards and guidelines, and other reference documents.
- a. Topminnow-Desert Pupfish Reintroduction. We monitored captive, natural, and reintroduced populations of Gila topminnows and desert pupfish.
  - b. Forest Raptors. Funding allocated to this project was re-allocated to various other projects to compensate for budget shortfalls. Forest raptor management issues were handled by base program staff as available and necessary.
  - c. Black-footed Ferret Reintroduction. We began reintroduction of ferrets into the Aubrey Valley, using pre-conditioning pens for on-site acclimation before release in Fall and early Winter. Ferrets are being held in on-site pens for breeding before additional releases occur. We also measured prairie dog burrow densities, and monitored Aubrey Valley for wildlife diseases.
  - d. California Condor Reintroduction. We released 15 hatchling and juvenile condors from conditioning pens on the Vermilion Cliffs. Eleven were alive in the wild at the end of FY96-97.
  - e. Additional Management Activities. We continued a native fish reestablishment project on Arnett Creek; completed a status review for the roundtail chub in

the Verde River basin; and participated in Recovery Teams and other interagency work groups to develop native fish management recommendations.

5. Fund, collaborate with, and/or coordinate Job-related efforts by cooperators.
  - a. Thick-billed Parrot. We again contributed to an international effort to determine occurrence and habitat requirements of the thick-billed parrot and the closely related maroon-fronted parrot.
  - b. Navajo Nation Wetlands and Riparian Habitats Inventory and Mapping. We completed a contract with The Navajo Nation to monitor riparian and wetland habitats and wildlife on its Tribal lands.
  - c. We provided technical support for Heritage grants, by: reviewing proposals; providing technical recommendations on objectives and methods; reviewing and approving required permits; providing technical support on funded projects; and reviewing draft completion reports.
6. Train Department personnel and cooperators in inventory, monitoring, and management techniques.
  - a. We conducted workshops and provided other training on: power analysis and methods of sampling and analysis applicable to rare species; and inventory, monitoring, research, and other management techniques.
  - b. We participated in five Endangered Species Act Workshops, to provide current information on the Act, and the major issues associated with reauthorization.
7. We identified research recommendations and priorities for special elements by: providing input on study designs, sampling methods, Geographic Information System methods, and statistical analysis for various species; revision of the Heritage Sensitive Element list; developing fish monitoring protocols mandated by the Central Arizona Project Biological Opinion; participation in interagency working groups; and reviewing and priority ranking research/monitoring/education proposals from the Western Working Group of Partners in Flight.
8. Develop recommendations pertinent to wildlife management and related resource protection laws, rules, Commission Orders, and policies.
  - a. We reviewed, recommended changes, and obtained Commission approval for Commission Orders: 13 (Other Birds and Mammals); 14 (Predators and Furbearers); 25 (Raptor Capture Seasons); 40 (Fish); 41 (Amphibians); 42

- (Crustaceans and Mollusks); 43 (Reptiles); and other Commission Orders, rules, policies, and state and federal laws. We also reviewed Scientific Collecting and Wildlife Holding permit applications and permit reports, and evaluated and recommended changes in the federal Endangered Species Act.
- b. We developed various recommendations pertinent to wildlife management and related resource protection laws, rules, and policies. Through a Total Quality review, we developed and implemented an improved process for administering the Department's Scientific Collecting Permits and Wildlife Holding Permits.
  - c. We provided comments on permit applications and reports, and issued or denied applications as appropriate.
9. We evaluated sites, projects, and documents to determine the need or potential to enhance, mitigate, and protect wildlife values and scientific, educational, and recreational uses. We designed and implemented site improvements, developed Habitat Conservation Plans and management recommendations, evaluated sites for acquisition, and designed site improvements.
  10. Maintain computerized and other databases, information systems, and files for project-related management and element-status information.
    - a. Database Management/Statistics. We hired a Nongame Statistician to help design studies, statistical analyses, and databases.
  11. We submitted site-specific locality information to the Heritage Data Management System for entry and subsequent use in project consultations.
  12. We labelled, filed, and archived photographs (prints, negatives, and slides) to document field activities, habitat conditions, presence of sensitive species at specific localities, and condition of specimens collected. These materials also are used for publications and presentations of results of field projects and other activities.

#### JOB 4: PLANNING AND EVALUATION

- A. Objective: Develop and maintain strategic, operational, and other plans in support of wildlife management programs; and evaluate procedures, activities, accomplishments, and needs under this project.
- B. Approaches and Activities:

1. Develop strategic plans for inventory, monitoring, recovery, and other management and protection-planning activities for sensitive species and habitats.
  - a. We solicited public comment on *Wildlife 2000*, prepared detailed Department responses, and discussed the issues with the Commission in December 1996.
2. Develop operational plans for inventory, monitoring, recovery, and other management and protection-planning activities for sensitive species and habitats.
  - a. Watershed Approach to Fisheries Management Plan. We began work on the Little Colorado River Basin by drafting a work plan incorporating aspects from similar projects in other states. We collected fisheries data, created databases, and began data analyses. We presented project updates at various meetings.
  - b. Wet Canyon Talussnail Conservation Plan. We drafted a conservation plan for the Wet Canyon talussnail.
  - c. Sonora Chub Management Plan. No activity.
  - d. Gila Trout Conservation Strategy and Reintroduction Plan. We continued coordinating with cooperators to assess whether and how to replicate New Mexico's Spruce Creek strain of Gila trout in Arizona.
  - e. Sonoran Tiger Salamander. We participated in Conservation Assessment and Strategy meetings with cooperators, and drafted a Conservation Easement for a private property. We reviewed pertinent literature, and consulted experts to determine management needs and sampling procedures. We surveyed potential and historic salamander sites on public lands.
  - f. Ramsey Canyon Leopard Frog Conservation Plan. We finalized a Ramsey Canyon Leopard Frog Conservation Agreement intended to remove threats and bring about recovery of this highly sensitive species, thus obviating the need to protect this species under the federal Endangered Species Act.
  - g. Tarahumara Frog Conservation Strategy and Reintroduction Plan. We gave a presentation on, and led discussion of, Tarahumara frog conservation at the third annual meeting of the Southwestern United States Working Group of the Declining Amphibian Populations Task Force.
  - h. Flat-tailed Horned Lizard Conservation Plan. We finalized an interagency Flat-tailed Horned Lizard Conservation Agreement that will guide conservation actions to remove threats and bring about recovery of this species.

- i. Partners in Flight (Western Working Group Coordinator). We helped other western states develop their Bird Conservation Plans, write a Regional plan, and develop workshops on implementing plan recommendations. We conducted three regional planning workshops, and attended other working meetings and conferences. We drafted an Arizona Partners in Flight Bird Conservation Plan and presented it at the 1997 North American Wildlife and Natural Resources Conference. We also reviewed or wrote various funding proposals.
  - j. Bat Monitoring Plan. We initiated a long-term program to monitor bat populations and key roost sites throughout the state.
  - k. Desert Tortoise Monitoring. We helped finalize the Arizona Interagency Desert Tortoise Team *Management Plan for the Sonoran Desert Population of the Desert Tortoise* and edited a desert tortoise handling protocol.
  - l. Jaguar Conservation Plan. We developed and implemented a Jaguar Conservation Agreement, based on a Conservation Assessment and Strategy developed with government and private cooperators.
3. Develop proposals for project-related activities as necessary to secure funding or approval.
- a. We again coordinated guidelines for development of Section 6 project proposals with U.S. Fish and Wildlife Service.
  - b. The following proposals were funded by the U.S. Fish and Wildlife Service: Section 6, Endangered Species Act -- Kanab ambersnail management; topminnow/pupfish management; razorback sucker/Colorado squawfish monitoring; ranid frog conservation; New Mexico ridgenose rattlesnake ecology; bald eagle management; cactus ferruginous pygmy-owl management; California condor reintroduction; black-footed ferret reintroduction; Hualapai Mexican vole management; and six-bat survey; Partnerships for Wildlife -- ranid frog management; and desert tortoise management.
  - c. The following proposals were funded as Department Heritage Special Projects: nongame statistician; Watershed Approach to Fisheries Management Plan; ranid frogs management; desert tortoise management; Arizona bald eagle management; California condor reintroduction; northern goshawk demography; Arizona Breeding Bird Atlas; Western Working Group Partners in Flight Coordinator; neotropical migratory bird program; Lake Pleasant bald eagle nestwatch; thick-billed parrot reestablishment; peregrine falcon monitoring; bat

management; Mount Graham red squirrel management; Sonoran pronghorn survey; and black-footed ferret management.

- d. The following proposals were funded by other state or federal agencies: Arizona Department of Emergency and Military Affairs -- bat surveys on ADEMA properties; Bureau of Land Management -- southwestern willow flycatcher survey and monitoring; Arizona Partners in Flight Arizona Bird Conservation Plan Facilitator; lesser long-nosed bat survey; National Fish and Wildlife Foundation -- ranid frog population management; U.S. Bureau of Reclamation -- Kanab ambersnail management; willow flycatcher survey and monitoring; U.S. Forest Service -- Bubbling Ponds Hatchery improvements for native fish; Seven Mile Wash improvements for native fish; bat surveys; and U.S. Fish and Wildlife Service -- Arizona Breeding Bird Atlas project.
4. We continuously assessed and revised as necessary all activities under the IIPAM-WM Project to improve quality, effectiveness, and efficiency. We reviewed activities, procedures, and accomplishments and frequently altered field activity schedules to accommodate administrative functions and reporting deadlines.

#### JOB 5: PUBLICATIONS

- A. Objective: Provide information on project-related activities, accomplishments, and needs.
- B. Approaches and Activities:
  1. We wrote and distributed the following newsletters to various mailing lists with statewide coverage: *Bald Eagle Nestwatch News*, *California Condor Update*, *Arizona Breeding Bird Atlas*, *Arizona Partners in Flight Southwestern Willow Flycatcher Update*, *Jaguar Conservation*, *Black-footed Ferret Reintroduction*, and *Mexican Wolf Reintroduction*.

We published *Arizona Wildlife Views* articles on: float-tube fishing, ranid frog conservation, the San Pedro River's value as a birding area, and a summary of the 1996 black-footed ferret reintroduction in Arizona. We also wrote an article that will be published in *Arizona Wildlife Views* in FY97-98: a feature entitled *Exotic crayfish in Arizona--a nuisance in our waters*.

We published *Nongame Field Notes* in *Arizona Wildlife Views* on the: Wet Canyon talussnail, Virgin spinedace, Sonora chub, blind snakes, desert spiny lizard, long-nosed leopard lizard, snowy egret, cactus wren, Harris's hawk, southwestern willow flycatcher, western red bat, and Arizona shrew. We also wrote *Nongame Field Notes* for *Arizona Wildlife Views* that will be published in FY97-98: Arizona coral snake,

Mediterranean gecko, Sonoran Colorado River toad, Sonoran gopher snake, and spiny softshell turtle.

We completed Technical Reports on: statewide riparian inventory and mapping; species status and distribution patterns in Arizona; Kanab ambersnail; status review of the roundtail chub; Gila topminnow extirpation sites; status of the Gila topminnow and desert pupfish; fish monitoring relative to the Central Arizona Project; native fish surveys of the Big Sandy, Hassayampa, and Santa Maria drainages; native fish surveys of Burro Creek and associated tributaries; herpetofaunal inventory of Wet Beaver Creek Wilderness; ranid frog conservation in Arizona; California condor reintroduction; Arizona bald eagle winter count; Arizona Breeding Bird Atlas; willow flycatcher survey; Arizona bald eagle nestwatch; Arizona bald eagle nest survey; black-footed ferret release protocol; jaguar conservation assessment and strategy; bat inventory on Wet Beaver Creek; bat management; Sonoran pronghorn monitoring (two reports); and black-footed ferret reintroduction.

We authored or co-authored the following articles for publication by cooperating agencies: U.S. Bureau of Reclamation *Glen Canyon Environmental Studies Newsletter*, one article on Kanab ambersnail biology; U.S. Geological Survey (USGS) Cooperative Park Studies Unit at the University of Arizona quarterly newsletter *Bajada*, one article on status and conservation of southwestern leopard frogs, one on management of the desert tortoise, two on desert tortoise reproduction and long-term monitoring in the Sonoran Desert, and one on conservation of the flat-tailed horned lizard; and USGS Biological Resource Division *National Status and Trends*, one article on status and conservation of southwestern leopard frogs.

We co-authored an article in *The Southwestern Naturalist* on the ecology of native fishes in the Little Colorado River

Publications completed on amphibians and reptiles included two reports from private contractors, on desert tortoise population surveys of the Beaver Dam slope and two Sonoran Desert sites.

We produced the following brochures: *Arizona Reptile and Amphibian Regulations* for 1997; *Chuckwallas of South Mountain Park*; California condor reintroduction; Arizona Partners in Flight; and bald eagles at Lake Pleasant and Luna Lake.

2. We reviewed, edited, and published manuscripts as noted above.
3. We revised and/or reprinted the following previously-published Technical Reports: Arizona breeding bird atlas project 1993 progress report; Arizona peregrine falcon eggshell study; Arizona breeding bird atlas project 1994 progress report; Arizona



Bald Eagle Nestwatch Program 1994-1995 management recommendations; Arizona Partners in Flight 1995 southwestern willow flycatcher survey; 1996 Arizona bald eagle winter count; summary of information on four potential Mexican wolf reintroduction areas in Arizona; cooperative reintroduction plan for black-footed ferrets; and assessment of potential black-footed ferret habitat in northern Arizona.

4. We presented results at various conferences, workshops, and other wildlife and conservation meetings, including:

30<sup>th</sup> (1997) Joint Annual Meeting of the Arizona-New Mexico Chapter of The Wildlife Society: findings of investigations on the Kanab ambersnail; ranid frog management project activities; Arizona Breeding Bird Atlas; southwestern willow flycatcher; Arizona Bat Resource Group (break-out session).

Arizona-New Mexico American Fisheries Society Joint Chapter Meetings: presentation on results from the Gila chub status assessment project, and overview of a watershed approach to fisheries management in Arizona;

Joint Annual Meeting of the American Society of Ichthyologists and Herpetologists, Society for the Study of Amphibians and Reptiles, and Herpetologists' League: ranid frog management project activities.

3<sup>rd</sup> Annual Conference of the Southwest Working Group of the Declining Amphibian Populations Task Force: ranid frog management project activities.

Annual Symposium of the Desert Tortoise Council: desert tortoise management activities (two presentations).

Symposium on the Natural History and Biology of the Sonoran Desert Tortoise: desert tortoise management activities (two presentations).

Other presentations included: various nongame and endangered wildlife issues, at public meetings of the Arizona Game and Fish Commission; various Heritage Program issues, at public meetings of the Heritage Oversight Committee; bald eagle, Arizona Breeding Bird Atlas, and willow flycatcher, at Audubon Society meetings; northern goshawk survey and monitoring techniques, at a White Mountain Apache Tribal wildlife conference; bald eagle management, at McDonnell Douglas Helicopter Company and a local boy scout meeting; and Mexican wolf reintroduction, at an annual meeting of Preserve Arizona's Wolves (P.A.W.S.)

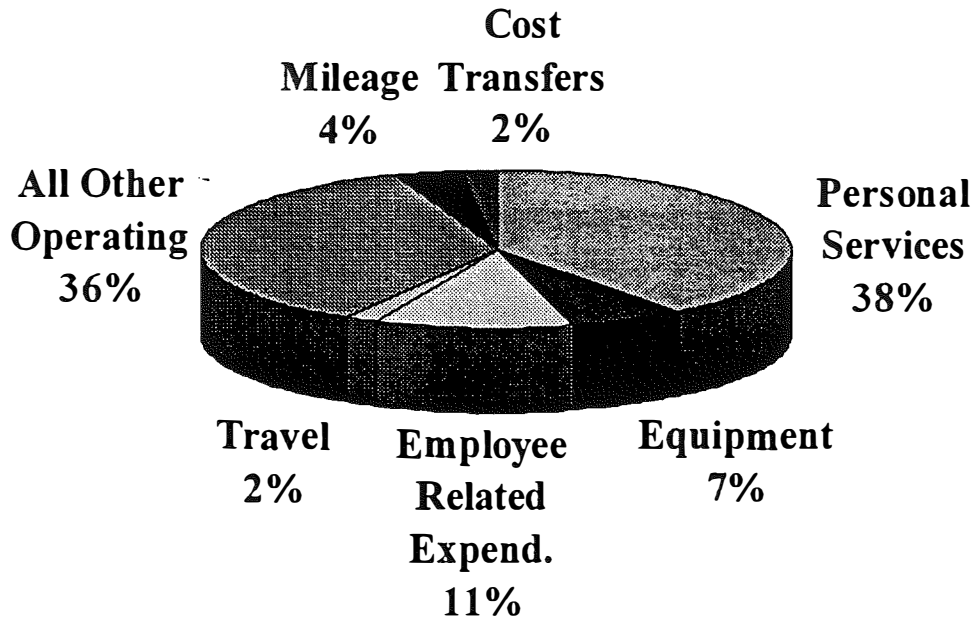
5. We disseminated press releases and other information to the mass media on: general native fish issues; razorback sucker management activities in Lake Mohave; completion of the Ramsey Canyon Leopard Frog Conservation Agreement; rescues of Arizona bald eagle nestlings; impacts of monofilament fishing line and fishing tackle on bald eagles and other birds; bald eagle closures near high-use recreation areas; reintroduction of the California condor; black-footed ferret reintroduction; jaguar conservation; and management of the Mount Graham red squirrel, Sonoran pronghorn, and various species of bats. We wrote a script for an *Arizona Wildlife Views* television series show on bird nest types; and updated the Arizona Partners in Flight website and added a new section for potential partners.
  
6. We prepared a Performance Report summarizing results under this Project during FY95-96, and a Project Work Plan for FY97-98.

II. PROJECT BUDGET.

HERITAGE IDENTIFICATION, INVENTORY,  
ACQUISITION, PROTECTION & MGMT. (IIPAM)  
FISCAL YEAR 1996-97

TOTAL EXPENDITURES = \$3,962,430.22

TOTAL BUDGET = \$4,579,800.00\*



\*Includes carry forward funds (Annual Base Budget = \$3,600,000.00).

Figure 3. Identification, Inventory, Protection, Acquisition, and Management Budget (all IIPAM Projects; pie chart).

HERITAGE IDENTIFICATION, INVENTORY,  
ACQUISITION, PROTECTION, & MGMT.  
(IIPAM)  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$3,962,430.22

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Personal Services	1,560,368.48
Employee Related Expend.	428,452.58
All Other Operating	1,424,301.16
State Travel	64,927.35
Equipment	258,984.95
Mileage	152,460.70
<u>Cost Transfers</u>	<u>72,935.00</u>
TOTAL	3,962,430.22

Figure 4. Identification, Inventory, Protection, Acquisition, and Management Budgets (all IIPAM Projects; line item amounts).

## URBAN: URBAN WILDLIFE PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Urban Wildlife Project (URBAN).

### I. JOB SPECIFIC INFORMATION

#### JOB 1: RESEARCH AND INVENTORY

A. Objective: Develop the biological and social information needed to support sound management and conservation of urban wildlife and its habitat, to support environmental review, and to address the needs and expectations of the public for wildlife-related recreation and enforcement of wildlife laws.

#### B. Approaches and Activities:

1. Conduct inventories and research on wildlife and wildlife habitats in urban settings to determine management needs and solutions.
  - a. Winter raptor surveys were conducted in and around the Tucson and Phoenix metropolitan areas. Fourteen species of hawks, owls and vultures were detected in the Tucson area and 15 species were found in the Phoenix area. Survey data will be used to monitor raptor populations as the cities expand.
  - b. The Tucson-area cactus ferruginous pygmy-owl survey that was partially funded by a Heritage internal enhancement (U95503) was completed.
  - c. Monitoring of raptor nests continued in the Phoenix and Tucson areas.
  - d. Monitoring of rehabilitated and relocated javelina continued in the Tucson and Phoenix areas. The purpose of monitoring movements and survival is to evaluate the effectiveness of releasing urban "problem" javelina in rural areas.

#### JOB 2: HABITAT CONSERVATION AND RECREATION

A. Objective: Support conservation, restoration, and enhancement of habitats of value to wildlife in urban settings; and develop and maintain local wildlife-related recreational opportunities for residents of urban communities.

#### B. Approaches and Activities:

1. Facilitate restoration or enhancement of native terrestrial and aquatic wildlife habitats and populations in urban areas.
  - a. The Department assisted city and county departments, homeowners associations, and Girl Scouts with planning and sometimes implementing restoration of riparian and wetland habitats in the Tucson area.
  - b. The Department worked with Boy Scouts, Salt River Project, and the Arizona Wildlife Federation on a project to place and monitor bat boxes in Phoenix and a proposal to construct burrowing owl habitat near Apache Junction.
2. Advocate the incorporation of wildlife resources and related recreational opportunities into community planning processes.
  - a. The Department worked with Pima County Planning Staff to identify important wildlife resources on a county-wide basis, and to craft development standards and guidelines that are intended to conserve wildlife resources. This project may set a significant precedent for Arizona because wildlife considerations are being front-loaded as one of the driving factors in regional planning. The Department's involvement is expected to continue well into 1998.
  - b. The Department participated in the multi-agency planning of the Tri-Villages area in north Phoenix.
  - c. The Department continued to provide technical assistance to Fountain Hills and Scottsdale to support land-use planning in the McDowell Mountains and other aspects of placing portions of the McDowells into protected public status.
3. Cooperate with agencies, local governments and organizations to develop and enhance wildlife-related recreational opportunities in urban areas.
  - a. We assisted Gilbert, Phoenix, Tucson, private developers, and others with planning project enhancements to facilitate wildlife-related recreation at wastewater treatment wetlands, Phoenix Rio Salado, and golf courses.
  - b. We helped landowners and municipalities in the Phoenix area place signs on private and city lands to minimize conflicts between hunters and residents during small game hunts.

### JOB 3: HUMAN/WILDLIFE INTERACTIONS

- A. Objective: Assist with resolving conflicts between humans and wildlife in urban settings.

B. Approaches and Activities:

1. Provide technical, logistical and advisory support for urban wildlife/human community issue resolution, with emphasis on private sector solutions.
  - a. The Mesa and Tucson Regional offices and the Department's Adobe Mountain Wildlife Center handled more than 6000 phone calls from people who were having problems with wildlife around their homes or businesses. Most problems were resolved by offering information and advice over the phone and, for some species, following up with a brochure in the mail.
  - b. We gave dozens of public talks about how to prevent problems with urban wildlife and how to deal with problems when they occur. The Department also distributed this information through newspaper, television, and radio interviews.
  - c. The Department was invited by a City of Tucson committee to help address conflicts with bats in City Hall, and ironically, to discuss how to promote bats to help with the City's mosquito problem.
2. Support and maintain wildlife rehabilitation efforts.
  - a. The Department's Adobe Mountain Wildlife Center sponsored the 1997 Wildlife Rehabilitators' Conclave. The conclave offers a variety of classes and provides an opportunity for wildlife rehabilitators to earn continuing education credits needed to satisfy licensing requirements. This year's program also provided an opportunity for veterinarians to earn continuing education credits.
  - b. The Department supported private wildlife rehabilitators by answering technical and other questions, inspecting facilities, issuing licenses and renewals, recommending wildlife release sites, and assisting with releases of recovered animals.

JOB 4: GRANTS AND MANAGEMENT

- A. Objective: Provide financial assistance to agencies, local governments, school districts, and organizations to support the conservation of wildlife and wildlife habitats and to promote wildlife-related recreation and education in urban environments; and implement the Urban Wildlife Program in an efficient, effective, and consistent manner.
- B. Approaches and Activities:

1. Solicit, evaluate, and prioritize project proposals. Administer and monitor funded projects.
  - a. Urban Wildlife Program staff in the Regional offices and Phoenix office helped with grant application workshops, assisted applicants with the application process, reviewed applications, offered technical advice during project implementation, and inspected or reviewed completed products.
2. Fund projects that support the Urban Wildlife Program.
  - a. Fifteen Heritage grant applications were submitted to the Urban funding focus and 13 projects were approved for funding.
3. Fund schoolyard habitat projects.
  - a. See the Information & Education Annual Report.
4. Communicate and coordinate with personnel involved in the Urban Wildlife Program.
  - a. Internal communications about projects and issues were maintained in the Tucson and Mesa Regions and among the Regions and Phoenix Headquarters.
5. Gather and compile information for completion of Urban Wildlife Program performance reports, work planning, budget, etc.
  - a. The annual work plan, performance report, and biweekly time and travel reports were completed.
6. Participate in training and develop in-house training to increase ability to implement the Urban Wildlife Program.
  - a. Through in-house training, Wildlife Manager trainees were introduced to Heritage Program activities, the Heritage grants process, and to the Urban Wildlife Project and their duties in urban areas.

#### JOB 5: ENFORCEMENT AND PROTECTION

- A. Objective: Protect urban wildlife populations, habitats, and public safety by assuring compliance with state and federal laws.



B. Approaches and Activities:

1. Wildlife Managers (officers) patrolled the urban lakes for fishing violations and patrolled areas within and immediately surrounding the Tucson and Phoenix metropolitan areas during hunts. They investigated violations reported by the public and followed up on investigations begun by other officers.
2. A program to inspect taxidermists for compliance was designed and implementation was begun in the Phoenix area.

II. PROJECT BUDGET.

HERITAGE URBAN WILDLIFE & HABITAT  
FISCAL YEAR 1996-97

TOTAL EXPENDITURES = \$1,333,141.75

TOTAL BUDGET = \$1,500,000.00

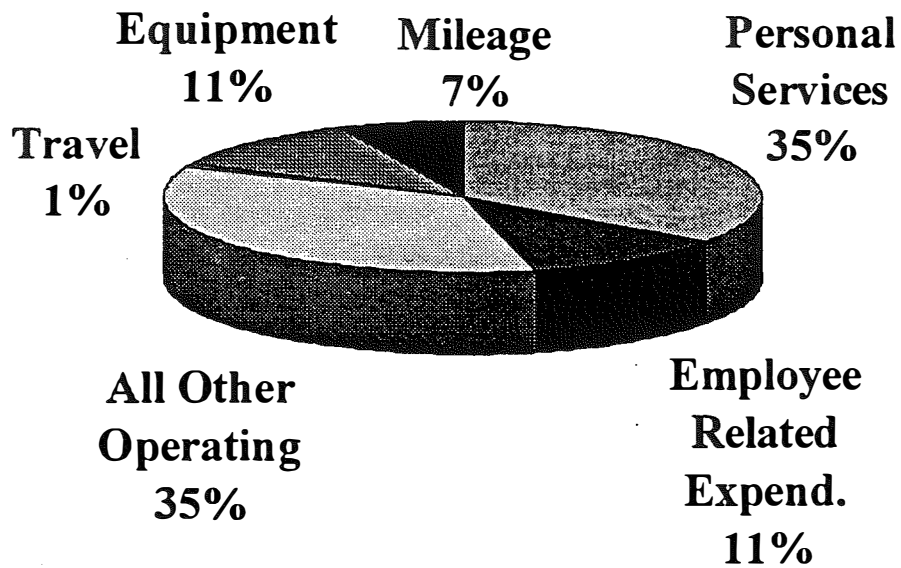


Figure 5. Urban Project Budget (pie chart).

HERITAGE URBAN WILDLIFE & HABITAT  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$1,333,141.75

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Personal Services	465,140.86
Employee Related Expend.	147,760.13
All Other Operating	467,457.14
State Travel	12,552.36
Equipment	146,314.52
<u>Mileage</u>	<u>93,916.74</u>
TOTAL	1,333,141.75

Figure 6. Urban Project Budget (line item amounts).

ACCESS: ACCESS PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Access Project (ACCESS).

I. JOB SPECIFIC INFORMATION

JOB 1: SIGNAGE AND PUBLIC INFORMATION

A. Objective: Inform and educate recreationists about the proper use of publicly held lands and access opportunities to those lands, through brochures, signs, maps, and other informative materials, as well public meetings and presentations to recreationists and landowners.

B. Approaches and Activities:

1. We participated in meetings of a regional Forage Resource Study Group (FRSG), which is made up of landowners, representatives of state and federal resource management agencies, and sportsmen's groups to develop strategies for a regional transportation management plan. A petition to close several roads associated with the finalized FRSG plan was approved by the Arizona Game and Fish Commission for habitat protection purposes.
2. Many regulatory and informational signs were developed and installed.
3. The 1-800-VANDALS hotline continued to be used by the public to report access problems or vandalism that could result in a loss of access if not addressed expeditiously.
4. The Landowner-Lessee/Sportsman Relations Committee met twice to help the Department identify and set priorities for issues and conflicts between recreationists and landowners. Possible resolutions were discussed that would help minimize existing conflicts.
5. Brochures that describe the issues and problems associated with public recreational access were distributed through Regional offices, by Wildlife Managers, and at public meetings to target user groups that can help resolve these issues. A video was produced for television that describes access issues and the Department's public programs designed to address issues that generally lead to loss of access to public and private lands.

6. We established booths at statewide meetings of the Arizona Cattle Grower's Association, and attended meetings to make presentations at sportsmen's groups and off-highway vehicle user groups to present issues and solicit participation in cooperative access programs such as the Adopt-A-Ranch, Stewardship, and RESPECT programs.
7. Several public and advisory group meetings were held in conjunction with the Charouveau Gap road proposal to identify and address public concerns. We also made a presentation to the Pinal County Planning and Zoning Commission regarding the project. The results of these meetings helped the Department complete an environmental evaluation and proposal alternatives, including the preferred alternative with mitigation measures. Subsequently, we received approval from the Commission to purchase the easement to provide recreational access.
8. We mailed a responsive management questionnaire to RESPECT Program participants as a tool to evaluate program effectiveness and customer satisfaction.
9. Program information presentations were made to several organized recreationist groups to provide information and solicit participation in the Department's Adopt-A-Ranch and Respect Programs.
10. Several access-related articles were written and published in *Arizona Wildlife Views*.

#### JOB 2: ACCESS COOPERATION

- A. Objective: Increase, maintain, or reduce public access as required for recreational use, in cooperation with federal land managers, state and local governments, private landowners, and public land users.
- B. Approaches and Activities:
  1. The Access Program continued to interact with land management agencies and the Department's Regional offices and individual Wildlife Managers to address access-related issues and possible resolution of current problem areas.
  2. To address concerns regarding littering during dove hunting seasons, we placed litter barrels and littering statute signs in local problem areas, and distributed flyers at shotgun shell retailers. As a result, the littering problems were substantially reduced.
  3. The King's Anvil stewardship agreement was renegotiated and amended to extend hunter access through private portions of the ranch for an additional five years. The Commission approved a stewardship agreement with Diamond Bell Ranch near

Sasabe that will allow permitted public users of State Trust lands to traverse the private property portions of the ranch to gain access to the public and State Trust lands beyond. Work continued on Yavapai Ranch in association with a stewardship agreement to maintain access to adjacent National Forest lands. Access to more than 410,000 acres is being maintained through the Access Stewardship Program.

4. We began evaluating the feasibility of obtaining an easement from the Burlington Northern/Santa Fe to cross their lands for access to State Trust lands.
5. Through informal agreements with landowner/lessees, we provided informational and regulatory signage and accessories through the Access RESPECT Program on 91 ranches statewide to alleviate problems associated with recreational access. Work continues on more than 250 ranches statewide with an area of coverage of about 10,625,000 acres.
6. We facilitated and participated in Adopt-A-Ranch activities on nine ranches statewide, covering more than 2,000,000 acres.
7. Rights-of-way were applied for or obtained from the Arizona State Land Department to establish or enhance access to the Box O Ranch near Florence and to Charouleau Gap near Tucson.
8. We received four petitions for road closures for Commission action, resulting in closures to vehicular access for resource protection purposes in each case. Alternative access remained, resulting in no net loss of areas available to the public for recreational activities.
9. We continued coordination with the U.S. Forest Service to maintain or enhance access to National Forest lands. Two easements were acquired for access into the Box O Ranch: one from the Bureau of Land Management, and the other from the Arizona State Land Department.

### JOB 3: INVENTORY AND NEEDS ASSESSMENTS

- A. Objective: Fund identification, inventory, and evaluation of public access needs to public, State Trust, and private lands to ensure good land use and access planning decisions.
- B. Approaches and Activities:
  1. Computerized databases have been established and maintained to track current budget information, Respect Program participation, Adopt-A-Ranch activities, Stewardship

Program activities, road closure reports, and Heritage Access Grant-In-Aid project status.

2. Global Positioning System satellite systems hardware and software were upgraded to provide real-time corrected data collection. The system was used to survey and map several project sites, including the Charouveau Gap easement, Box O Ranch easement, a cooperative project with Arizona State Parks to map the Alamo Lake State Park facilities, site-locate a new water well on the Department's Raymond Ranch Wildlife Area, map proposed Forest Service roadways at Stanford and Pridham Canyons in the Chiricahua Mountains, and evaluate applications within other program areas.
3. A Memorandum of Understanding between the Arizona Game and Fish Commission and the U.S. Geological Services (USGS) was drafted and approved that will allow the Department to enter into subsequent specific project agreements. Our Access and Geographical Information Systems sections are negotiating a project agreement with USGS to cooperatively develop a series of maps depicting individual wildlife management units.
4. We participated in meetings with the FRSG in Coconino County to help develop and implement a road/transportation management plan for Wildlife Management Units 5A and 5B. The strategies include closure of certain roads for habitat and resource protection, maintenance of primary roads, establishment of parking areas to accommodate sportsmen, and installation of signs to indicate designated access routes and pertinent information. Several road closures were petitioned and approved by the Commission. The signs are being installed.
5. Written and verbal reports were collected from the public relating to public access issues and concerns.
6. Department regional offices were solicited to provide current access issues and needs statewide.

#### JOB 4: GRANTS

- A. Objective: Develop cooperative recreational access projects with other agencies, through a grants-in-aid program.
- B. Approaches and Activities:

1. The following grants were administered during FY96-97:

Projects Awarded During Fiscal Year 1996-97			
Project Number	Title	Grant-in-Aid Participant	Project Award
P93024	Gerald H. Turley Trail	Yavapai Co. Parks and Recreation	\$9,159
P94001	Southeastern Arizona Recreational Access Brochure	SouthEastern AZ Governments Org.	\$12,000
P94002	Wenima Riparian Corridor and Sipe White Mtn. Wildlife Area	Arizona Game and Fish Dept. Region I	\$5,360
P94008	Improving Access at Sunrise Lake	White Mtn. Apache Fish and Game Dept.	\$43,000
P94009	Fort Apache Fishing Piers	White Mtn. Apache Fish and Game Dept.	\$21,600
P94013	Gila Box Watchable Wildlife Area	U.S.D.I. BLM Safford District	\$7,500
P94014	Tanque and Haekel Road Access	U.S.D.I. BLM Safford District	\$30,000
P95002	Tavasci Marsh Accessible Overlook Trail & Kiosk	U.S.D.A. Coronado Nat'l Forest	\$45,000
P96005	San Simon Valley Access Improvement	U.S.D.I. BLM Safford District	\$41,400
P96006	Wood Trail	U.S.D.A. Coconino Nat'l Forest	\$41,880
P96008	Riggs Lake Access Trail and Pier	U.S.D.A. Coconino Nat'l Forest	\$36,600
P96010	Urban Trail System/AZ State Trail	City of Flagstaff	\$56,000
P96011	Springerville Marsh Public Access Enhancement	Town of Springerville	\$11,246
*P96012	Frye Mesa Road Rebuild	City of Safford	\$50,000
<b>Total Dollars Awarded</b>			<b>\$243,661</b>



Projects Completed During Fiscal Year 1996-97			
P92019	Woodland Lake Park Barrier - Free Fishing Pier	Town of Pinetop-Lakeside	\$22,650
P92028	Wood Canyon Road and Trailhead Access	U.S.D.A. Coronado Nat'l Forest	\$26,665
P92033	Emigrant Canyon Access	U.S.D.A. Coronado Nat'l Forest	\$21,420
P93001	Handi-Cap Fishing Access Patagonia Lake	Arizona Game and Fish Dept. Region 5	\$30,854
P93009	Sopori Ranch Access	U.S.D.A. Coronado Nat'l Forest	\$32,130
P93010	Wood Canyon Access into Santa Rita Mtns.	U.S.D.A. Coronado Nat'l Forest	\$19,680
P93024	Gerald H. Turley Trail/Yavapai Co.	Yavapai Co. Parks and Recreation	\$9,159
P94001	Southeastern Arizona Recreational Access Brochure	SouthEastern AZ. Governments Org.	\$12,000
P94002	Wenima Riparian Corridor and Sipe White Mtn. Wildlife Area	Arizona Game and Fish Dept. Region 1	\$5,360
P94008	Improving Access at Sunrise Lake	White Mtn. Apache Fish and Game Dept.	\$43,000
P94009	Fort Apache Fishing Piers	White Mtn. Apache Fish and Game Dept.	\$21,600
P94013	Gila Box Watchable Wildlife Area	U.S.D.I. BLM Safford District	\$7,500
P94014	Tanque and Haekel Road Access	U.S.D.I. BLM Safford District	\$30,000
P95002	Tavasci Marsh Accessible Overlook Trail	U.S.D.A. Coronado Nat'l Forest	\$45,000
P95003	Fishing Access for Rose Canyon Lake - Phase 1	U.S.D.A. Coronado Nat'l Forest	\$25,000
P95005	Squirrel Canyon Trail #34 Reroute and Construction	U.S.D.A. Coronado Nat'l Forest	\$14,790
P95008	Empire Gulch Water Crossing	U.S.D.I. BLM Tucson Resource Area	\$20,000
P95010	Three Bridges Trail Entry	Pima Co. Flood Control District	\$20,740
P96011	Springerville Marsh Public Access Enhancement	Town of Springerville	\$11,246

Projects Ongoing During Fiscal Year 1996-97			
P92028	Wood Canyon Road and Trailhead Access	U.S.D.A. Coronado Nat'l Forest	\$26,665
P92033	Emigrant Canyon Access	U.S.D.A. Coronado Nat'l Forest	\$21,420
P93001	Handi-Cap Fishing Access Patagonia Lake	Arizona Game and Fish Dept. Region 5	\$30,854
P93009	Sopori Ranch Access	U.S.D.A. Coronado Nat'l Forest	\$32,130
P93010	Wood Canyon Access into Santa Rita Mtns.	U.S.D.A. Coronado Nat'l Forest	\$19,680
P93013	Stanford/Pridham Canyon Access	U.S.D.A. Coronado Nat'l Forest	\$58,700
P93024	Gerald H. Turley Trail/Yavapai Co.	Yavapai Co. Parks and Recreation	\$9,159
P94001	Southeastern Arizona Recreational Access Brochure	SouthEastern AZ. Governments Org.	\$12,000
P94002	Wenima Riparian Corridor and Sipe White Mtn. Wildlife Area	Arizona Game and Fish Dept. Region 1	\$5,360
P94004	Rucker Canyon Road R-O-W Perfection	Cochise Co. Highway and Floodplain Dept.	\$74,750
P94008	Improving Access at Sunrise Lake	White Mtn. Apache Fish and Game Dept.	\$43,000
P94009	Fort Apache Fishing Piers	White Mtn. Apache Fish and Game Dept.	\$21,600
P94013	Gila Box Watchable Wildlife Area	U.S.D.I. BLM Safford District	\$7,500
P94014	Tanque and Haekel Road Access	U.S.D.I. BLM Safford District	\$30,000
P95002	Tavasci Marsh Accessible Overlook Trail	U.S.D.A. Coronado Nat'l Forest	\$45,000
P95003	Fishing Access for Rose Canyon Lake - Phase 1	U.S.D.A. Coronado Nat'l Forest	\$25,000
P95005	Squirrel Canyon Trail #34 Reroute and Construction	U.S.D.A. Coronado Nat'l Forest	\$14,790
P95008	Empire Gulch Water Crossing	U.S.D.I. BLM Tucson Resource Area	\$20,000
P95010	Three Bridges Trail Entry	Pima Co. Flood Control District	\$20,740
P95011	White Mtn. Reservoir Access Project	U.S.D.A. Apache-Sitgreaves Nat'l Forests	\$53,200
P95014	Access Corridor to McDowell Sonoran Preserve	Arizona Game and Fish Dept. Region 6	\$36,100
P96002	Region 1 Property Trail Bridge and Kiosk	Arizona Game and Fish Dept. Region 1	\$6,535
P96005	San Simon Valley Access Improvement	U.S.D.I. BLM Safford District	\$41,400
P96006	Wood Trail	U.S.D.A. Coconino Nat'l Forest	\$41,880
P96008	Riggs Lake Access Trail and Pier	U.S.D.A. Coconino Nat'l Forest	\$36,600
P96010	Urban Trail System/AZ State Trail	City of Flagstaff	\$56,000
P96011	Springerville Marsh Public Access Enhancement	Town of Springerville	\$11,246
*P96012	Frye Mesa Road Rebuild	City of Safford	\$50,000

\*Project Cancelled

II. PROJECT BUDGET.

HERITAGE PUBLIC ACCESS  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$426,748.38  
TOTAL BUDGET = \$500,000.00

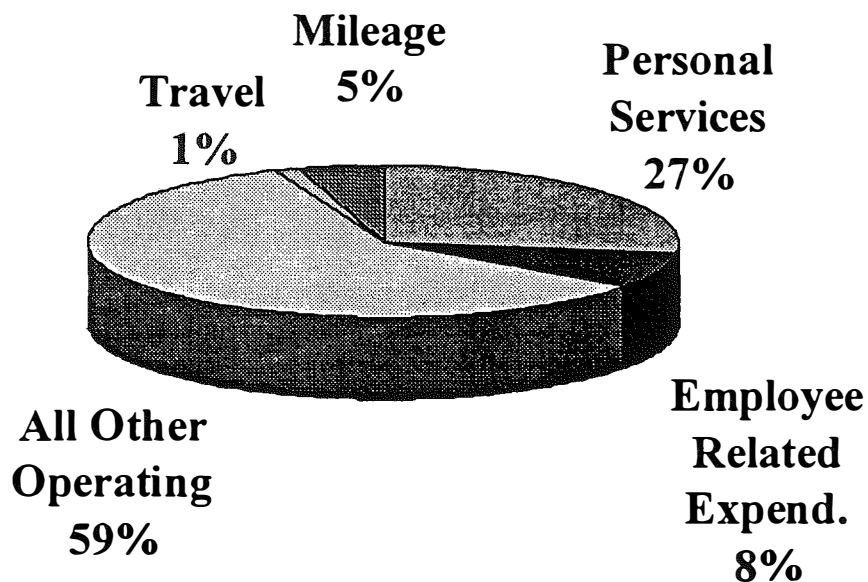


Figure 7. Access Project Budget (pie chart).

HERITAGE PUBLIC ACCESS  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$426,748.38



Personal Services	115,743.96
Employee Related Expend.	33,642.08
All Other Operating	250,821.72
State Travel	6060.26
<u>Mileage</u>	<u>20,480.36</u>
TOTAL	426,748.38

Figure 8. Access Project Budget (line item amounts).

EE: ENVIRONMENTAL EDUCATION PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Environmental Education Project (EE).

I. JOB SPECIFIC INFORMATION

JOB 1: EDUCATION

- A. Objective: Provide educational programs dealing with basic ecological principles and the effects of natural and human-related processes on natural and urban systems and programs, to enhance public awareness of the importance of safeguarding natural resources.
- B. Approaches and Activities:
1. In Arizona, the most used supplemental environmental educational resource guide was once again Project WILD. This award-winning program is sponsored by Arizona Game and Fish. We conducted 59 free educator workshops and trained more than 800 educators (classroom teachers and youth leaders).
  2. To support previously trained educators, three Focus Wild newsletters were mailed to more than 3500 educators.
  3. Many Project WILD workshops were conducted by professional educators volunteering their time. We conducted an in-service training workshop for these educators.
  4. We maintained more than 50 resource loaner-trunks across the state. Six new Bat learning trunks were developed. Topics now include general wildlife, bighorn sheep, black bears, bats, elk, and neotropical songbirds.
  5. The WILD supplemental materials packet was completely redesigned. This 60+ page guide goes to all WILD workshop participants.
  6. We responded to more than 4000 phone or mail requests for materials or information from educators or students.
  7. We provided several advanced-level workshops for 90 educators on the topics of Endangered Species and Native Fish.

8. More than 150 educators participated in three day-long Natural History Weekend field workshops.
9. Project staff participated in well over 20 educator events that reached more than 750 educators and 15,000 students.
10. Project staff conducted customer satisfaction and product quality surveys with all workshop participants and other customer groups.
11. We promoted and managed the Heritage E.E. Grants program: 15 new grants were awarded in FY96-97, bringing the total to more than 130 grants and awards totalling more than \$400,000.
12. We provided every public school in Arizona a free subscription to *Arizona Wildlife Views* magazine.

#### JOB 2: PUBLIC INFORMATION AND EDUCATION

- A. Objective: Develop awareness, appreciation, and understanding of Arizona's wildlife and its environment; and increase responsible actions toward wildlife.
- B. Approaches and Activities:
  1. We printed and distributed 20,000 copies of a Heritage Special Edition Calendar on "Arizona Hummingbirds."
  2. We solicited and printed more than 21 Heritage-specific articles in *Arizona Wildlife Views* magazine.
  3. We provided publications support and Heritage message integration in all appropriate agency publications.
  4. We provided access to wildlife information via an Internet Website.
  5. We prepared a 13-week half-hour television series called *Arizona Wildlife Views*, for run on Phoenix and Tucson Public Broadcasting System stations.
  6. We distributed free to cable television systems statewide the 1995-96 *Arizona Wildlife Views* television series, thus reaching as many as 500,000 households.
  7. We provided more than 300 copies of past television shows to public schools.

8. We maintained a year-round educational Wildlife Building at the state fairgrounds, servicing more than 300,000 visitors during year.
9. We cooperated with the State Capitol Museum to develop and maintain an exhibit on agency mission, wildlife management activities, and wildlife information.
10. We conducted a 10-program Wildlife Series (invited-speaker presentations to the public) at the fairgrounds Wildlife Building.
11. We held three Arizona Game and Fish Commission meetings at the fairgrounds Wildlife Building.
12. We maintained an Information and Education specialist position in the Flagstaff regional office.
13. We provided an exhibit at the Coconino County Fair.
14. We made 16 radio appearances on KYET in Williams.
15. We assisted other agencies and organizations with development of wildlife interpretive signage and/or exhibits.
16. We provided a public Watchable Wildlife tour that focused on bison.
17. We facilitated 14 elk partnership committee meetings to identify and address management issues.

II. PROJECT BUDGET.

HERITAGE ENVIRONMENTAL EDUCATION  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$423,690.43  
TOTAL BUDGET = \$500,000.00

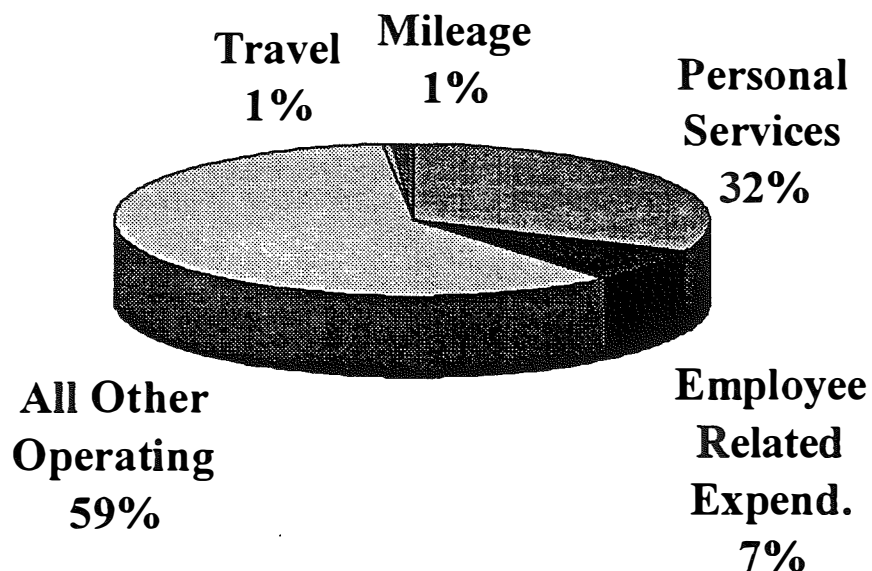


Figure 9. Environmental Education Project Budget (pie chart).



HERITAGE ENVIRONMENTAL EDUCATION  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$423,690.43

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Personal Services	134,390.10
Employee Related Expend.	30,503.71
All Other Operating	251,714.67
State Travel	2,471.50
<u>Mileage</u>	<u>4,610.45</u>
TOTAL	423,690.43

Figure 10. Environmental Education Project Budget (line item amounts).

ADMINISTRATIVE AND SUPPORT SERVICES PROJECT

This report provides information on all Jobs, Approaches, and Activities the Arizona Game and Fish Department (hereafter Department) conducted during State Fiscal Year 1996-97 (FY96-97) to accomplish objectives of the Administrative and Support Services Project.

I. JOB SPECIFIC INFORMATION

JOB 1: HERITAGE FUND PROGRAM ADMINISTRATION

A. Objective: Develop and implement a method of Heritage Program monitoring, agreements development, coordination and grants management, that is parallel to the Department's present Federal Grant-In-Aid Program, using existing standard rules and regulations when applicable; and annually ensure program, planning, granting, budget, and audit accountability for the Heritage Fund to the level at which a job is conducted.

B. Approaches and Activities:

1. Nineteen statewide grant application workshops were held in 10 cities in July and August 1996. Funds were available during FY97-98 in the following amounts and funding focus areas:

Urban Wildlife and Urban Wildlife Habitat	\$234,800
Public Access	\$224,500
Environmental Education	\$ 40,000
Schoolyard Grants	\$ 60,000
IIPAM	\$400,000

- a. We received 93 applications for external grants for 1997. We awarded 49 grants in April 1997 for first year expenditure in FY97-98. (More detailed grant information is included in Appendix II.)
- b. Rule-making was initiated to amend the Heritage Grant Application process to allow non-profit and not-for-profit agencies to be considered eligible applicants. In support of this effort, an Administrative Controls Evaluation document was developed and approved.

- c. Policy guidelines were developed for Department employees regarding the Heritage Fund Grant Program (see "Employee Guidelines for Participation in the Heritage Grant Program").
2. The Heritage Fund Administrator prepared and/or reviewed all Heritage Program narratives, job descriptions, and agreements, and all appurtenant documents to ensure project compliance with required standards and Department goals and objectives.
3. In addition to the required Commission related activities and project work plan reviews and approvals, all Commission budgets were loaded, new job codes were created where required, and updated job code sheets were circulated to new and existing employees with the attendant job titles where needed.
4. The State of Arizona Office of the Auditor General conducted a Performance Audit of the Department's Heritage Fund. This audit was released to the public on August 16, 1996.
5. In response to a recommendation from the Heritage Performance Audit, the Heritage Public Advisory Committee was created. Applications for membership were solicited, received, selected, and approved. We planned and coordinated three Committee meetings, in Phoenix, Tucson, and Flagstaff.
6. The annual indirect cost proposal was prepared, and Funds/Planning continued to monitor the expenditure of Heritage funds.
7. Heritage performance reports and other final reports were reviewed to determine that project objectives were met.
8. Commissioners were reimbursed for Heritage related travel.

#### JOB 2: HERITAGE FUND BUDGET SUPPORT/PREPARATION

- A. Objective: Ensure that all Heritage funds are budgeted and accounted for to the job level, using the Department's current job cost accounting and budgeting methods.
- B. Approaches and Activities:
  1. Project budgets were prepared at the job level, on an annual basis, and reviewed and updated monthly. In addition, seven amendments pertaining to Heritage budget or administration were taken before the Commission for public review and Commission approval in FY96-97, including annual budget requests for FY97-98 and FY98-99.

2. Project and grant expenditures were monitored for eligibility and applicability of costs on a monthly basis.
3. The Auditor General's Office completed the annual state audit.
4. Cost and job reports, fiscal information results, and data were provided to appropriate Department staff, budget, and Project Leaders on a quarterly basis, or otherwise as requested.

JOB 3: HERITAGE PLANNING SUPPORT

- A. Objective: Provide for annual feedback and monitoring of Heritage Program effectiveness, through periodic program reviews and surveys; and adjust, update, and integrate such data into Department strategic plan and work plan goals and objectives.
- B. Approaches and Activities:
  1. The Department's federally approved Responsive Management job of measuring public opinion was matched through Heritage with a 33 percent increase.
  2. A detailed review of the Department's mission and vision was completed, and a list of the Department's customers, products, and services was prepared. From this and other information, Performance Measures were developed.
  3. FY94-95 job evaluations were completed.
  4. The Responsive Management Coordinator worked with the Arizona Department of Transportation and Arizona State Parks to conduct a triennial survey of watercraft operators' usage patterns for fuel consumption. Other surveys completed included: Trends, Access Program, Law Enforcement Customers, and Flagstaff Area Public Meeting.

JOB 4: HERITAGE ACCOUNTING SUPPORT

- A. Objective: Enhance Department accounting capabilities to collect and reconcile expenditures and job costs, and make this information available to project leaders, budget unit supervisors, and management personnel; provide appropriate financial reporting to the Legislature on an annual basis; and ensure adequate annual fiscal accounting control and accountability for revenues, expenditures, and job costing associated with the Heritage Fund.

B. Approaches and Activities:

1. We prepared and analyzed financial reports that were developed from the Department cost-accounting system to manage budget allocations.
2. We developed and distributed reports and other financial data to budget unit supervisors and other Department personnel for budget management.
3. The three Heritage employees in Finance and Accounting Branch provide accounting support for the Department as follows:
  - a. The Reconciliation Technician reconciled expenditures between the internal accounting system and the statewide accounting system to ensure that all accounting transactions had been properly coded and posted.
  - b. The Payroll Technician position was upgraded to be a lead technician to assist with payroll and travel claim processing, preparing vehicle operating cost summaries, and reconciling per diem payments to ensure proper coding and posting of transactions.
  - c. The Accounts Payable Technician paid 25 percent of the Department's vendors.

JOB 5: COMPUTER SYSTEM PROGRAMMING ENHANCEMENT AND MAINTENANCE

A. Objective: Modify and enhance, through computer programming, the Department's Comprehensive Management System and Cost Accounting System to provide capabilities to evaluate jobs and program accomplishments; and support the Department's computer hardware and software, including Local Area Networks.

B. Approaches and Activities:

1. We provided staff support for the stand-alone and integrated computer systems.
2. We upgraded personal computers for support personnel, as necessary to comply with new Department hardware and software standards. We also provided technical support and supplies for the Local Area Network.

JOB 6: HERITAGE MOTOR POOL SERVICE

A. Objective: Enhance the Department's fleet management system, and provide adequate motor pool equipment repair.

B. Approaches and Activities:

1. The Vehicle Shop performed service on the Heritage motor pool fleet and conducted vehicle and equipment repair using Department staff and, when appropriate, outside vendors; equipped and modified new Heritage vehicles that replaced older vehicles in the Department fleet; repaired and maintained 74 vehicles from six Heritage motor pools; and installed an above-ground two-post hydraulic lift at the Vehicle Shop to increase maintenance efficiencies.

JOB 7: PRIMARY SUPPORT SERVICES AND PROCUREMENT FUNCTIONS

A. Objective: Expand the Department's ability to produce products and services, and procure services and products from vendors required by project leaders for implementation of the Heritage Program.

B. Approaches and Activities:

1. The Print Shop prepared printed material, including publications, reports, brochures, and other similar items that were used in conjunction with implementing Heritage Program activities. Using the large full-color press, we produced 72 Heritage print jobs totalling 2,143,845 impressions.
2. The Warehouse acquired, controlled, and distributed warehouse and supply items, and managed capital assets inventory.
3. Purchasing developed and solicited proposals and bids for acquisition of goods and services, and negotiated and administered contracts and contract procedures for all Department procurement activities.
4. Purchasing developed four Sole Source and one Emergency Contract (approved through the State Procurement office), as well as three solicitations, one Fax on Demand, one Request for Quote, and uncounted procurement consultations throughout the Department.
5. A Small Purchase Authorization Form was introduced to expedite procurement and payment of small purchases.

JOB 8: HERITAGE INFORMATION SUPPORT

A. Objective: Develop informational products related to wildlife issues; and improve and enhance the Department's public information programs that increase awareness and understanding of Heritage activities, wildlife issues, and the Department mission.

B. Approaches and Activities:

1. We wrote copy and submitted Heritage project photos for the 1997 Heritage calendar.
2. We completed a Fifth Year Heritage Anniversary *Arizona Wildlife Views* television show narrative highlighting Heritage-funded projects; it was aired on Channel 8 in Phoenix and Channel 6 in Tucson.
3. We attended a National Black-footed Ferret Recovery Team Outreach Conference in Denver, in March; developed a ferret brochure that will be distributed nationally by the outreach team; developed a "how to" list for obtaining media coverage for wildlife reintroduction efforts (reflective of our successful Heritage-funded black-footed ferret reintroduction media coverage); and attended the unveiling of ferret sculptures at the Wigwam Outlet Mall (in Phoenix; money tossed into the fountain was forwarded to the Department for use in ferret recovery efforts).
4. We provided new Heritage project photos for the Department's State Fairgrounds Wildlife Building display.
5. We produced a quarterly *Heritage Highlights* newsletter that has a mailing list of approximately 3000, including all state legislators.
6. We wrote copy for the Department's weekly *Wildlife Bulletin (Wildlife News)*, which is faxed to 250 media outlets, including radio, television, Arizona newspapers, and publications such as the *Los Angeles Times*, *Denver Post*, *Outdoor Life*, *Sports Afield*, and *Field and Stream*. We also wrote copy for a Heritage page on the Department's World-Wide Website, and wrote Heritage copy and provided photos for *Arizona Wildlife Views* magazine.
7. We put out localized press releases on the 19 statewide Heritage Grant Workshops.
8. We reviewed draft copies of various reports to ensure that the Department received appropriate recognition on Heritage-funded projects.
9. Heritage projects were highlighted via large photographs on a portable display, which was taken to wildlife fairs, conventions, and conferences. Heritage displays were also set up in the Department's (Phoenix office) front lobby, at the fairgrounds Wildlife Building (300,000 visitors annually), and in the six regional offices. Heritage information was also displayed in the showcase at the Capitol Building.

10. The 11-minute *Making a Difference* Heritage video and the 90-slide Fifth Anniversary Heritage slide show were again made available for public presentations by staff and to loan to teachers for classroom presentations.
11. We made Heritage presentations to the American Zoo Association and the Arizona Administrators Association-Careers Explorations Program.
12. We helped with media relations training sessions for new Wildlife Managers, making them news-conscious of Heritage-funded projects they may come in contact with.

JOB 9: HERITAGE AUDIO VISUAL SUPPORT

- A. Objective: Develop audio visual products related to wildlife issues; and improve and enhance the Department's public information programs that increase awareness and understanding of Heritage activities, wildlife issues, and the Department mission.
- B. Approaches and Activities:
  1. The Video Production Specialist position in Audio Visual Branch provided videography and editing support for the Department's television series (*Arizona Wildlife Views*) and other Heritage-funded productions. We met our video production schedule commitment for FY96-97. The format of the television shows produced in FY96-97 continued to be magazine style, whereby more subjects could be covered in the half-hour program. The round of shows included natural history vignettes on small animals, raptors, reptiles, migratory birds, watchable wildlife, sensitive habitats, sensitive species, urban wildlife, access projects, recreational fishing opportunities, and ongoing wildlife research projects.
  2. We continued third-party financing and maintenance of a Beta-SP video acquisition and editing system, which greatly improved broadcast quality of the *Arizona Wildlife Views* television show. The video camera systems were paid off in June 1997; the editing system will be paid off in June 1998.
  3. Technical assistance was provided to Heritage Grant Coordinators in updating the audio tracks for slideshows for Heritage Grant Workshops. Photographic support was provided for the special Heritage edition of *Arizona Wildlife Views* magazine and for the Heritage display at the Department's fairgrounds Wildlife Building. Technical assistance was also provided in production of videos for use in displays at the fairgrounds Wildlife Building.



JOB 10: HERITAGE COMMUNICATIONS SUPPORT

- A. Objective: Provide communications support to the Department's statewide radio dispatch network; and support the Department's field communications network.
- B. Approaches and Activities:
  - 1. For the majority of FY96-97, both Heritage-funded dispatch positions remained filled. Both individuals were fully trained and provided the assistance needed within the Communications Center to handle radio and telephone traffic.

JOB 11: HERITAGE PERSONNEL SUPPORT

- A. Objective: Provide support for the Department's Human Resources Office.
- B. Approaches and Activities:
  - 1. The Personnel Analyst: conducted monthly new employee orientations; conducted exit interviews for departing employees; and monitored Commercial Drivers' License (CDL) compliance for new CDL operators.
  - 2. The Personnel Analyst coordinated: mandatory drug/alcohol testing for CDL operators (and updated a database on same); the 1997 Employee Awards Ceremony; and preparation of the FY97-98 Affirmative Action Plan and mid and year-end Affirmative Action reports for FY96-1997.
  - 3. The Personnel Analyst provided employee training in: preventing and reporting Sexual Harassment; Ethics; Employee Performance Appraisal System; and Recruiting and Staffing Procedures.
  - 4. The Personnel Analyst participated in Total Quality training; helped begin implementing Total Quality in the Human Resources Office; and temporarily assumed Staffing and Human Resources Management System processing responsibilities while the Personnel Manager was involved in Total Quality training and implementation.

II. PROJECT BUDGET.

HERITAGE ADMIN. & SUPPORT SERVICES  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$638,945.45  
TOTAL BUDGET = \$710,253.00

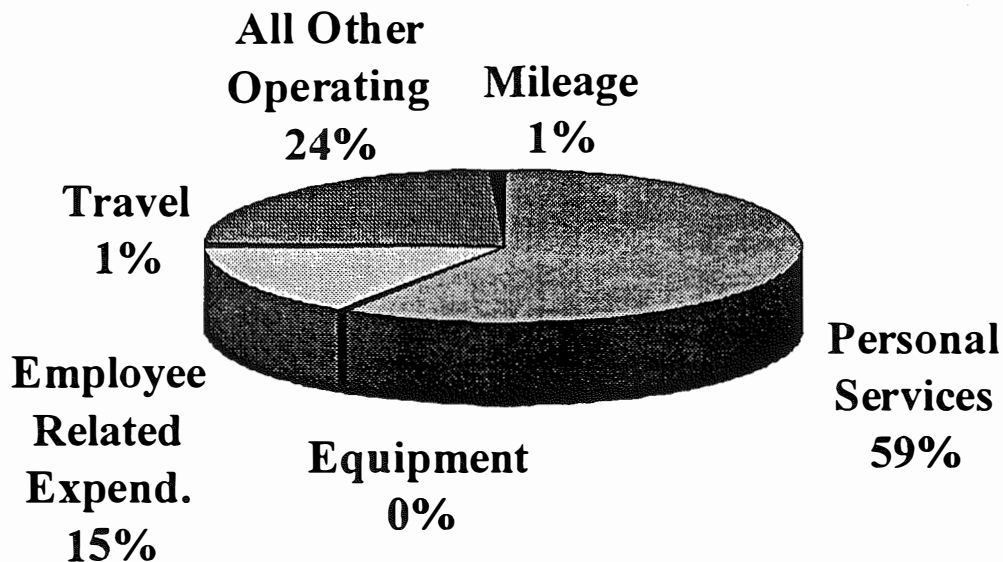


Figure 11. Administrative and Support Services Project Budget (pie chart).

HERITAGE ADMIN. & SUPPORT SERVICES  
FISCAL YEAR 1996-97  
TOTAL EXPENDITURES = \$638,945.45

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Personal Services	376,776.50
Employee Related Expend.	96,235.77
All Other Operating	151,992.47
State Travel	6,093.97
Equipment	2,730.90
<u>Mileage</u>	<u>5,115.84</u>
TOTAL	638,945.45

Figure 12. Administrative and Support Services Project Budget (line item amounts).

APPENDIX I: ADDITIONAL REPORTING REQUIREMENTS UNDER ARS 17-298 (G).

ARS 17-298 (G) requires the following seven items to be reported annually to the President of the Senate, Speaker of the House of Representatives, and the Committees on Natural Resources and Agriculture, or their successor Committees, in addition to the information presented in the preceding body of this report.

1. THE AMOUNT OF MONIES SPENT OR ENCUMBERED IN THE FUND DURING THE PRECEDING FISCAL YEAR FOR THE PURPOSE OF PROPERTY ACQUISITION.

During FY96-97, \$453,566.10 was spent on property acquisition and protection.

2. THE NUMBER AND LOCATION OF PARCELS OF PROPERTY ACQUIRED DURING THE PRECEDING FISCAL YEAR.

During FY96-97, 2476 acres were acquired or otherwise protected through lease or special land-use permit. This included 1448 acres at Whitewater Draw in Cochise County; 61 acres at Quigley Pond (Marlatt property) in Yuma County; and an increase from 320 acres to 967 acres at Arlington on the Gila River in Maricopa County, which was leased from the State Land Department (see map p. 75).

3. FOR PERSONAL AND REAL PROPERTIES ACQUIRED WITH FUND MONIES DURING THE PRECEDING FISCAL YEAR, THE AMOUNT OF PROPERTY TAX REVENUE PAID TO THIS STATE AND POLITICAL SUBDIVISIONS OF THIS STATE DURING THE LAST FULL TAX YEAR PRIOR TO ACQUISITION.

A total of \$2,707.86 was paid in property taxes during the last full tax year prior to acquisition. This includes \$2,131.00 paid on the Whitewater Draw property and \$576.86 on the Marlatt property.

The Arizona Game and Fish Commission is in the process of making payments in lieu of taxes for FY96-97. An estimated \$4,563.28 will be paid on lands purchased in previous years, of which an estimated \$3,202.83 will come from Heritage funds.

4. THE AMOUNT OF MONEY SPENT FROM THE FUND DURING THE PRECEDING FISCAL YEAR FOR EMPLOYEE PERSONAL SERVICES.

\$2,582,400

5. THE NUMBER OF FULL-TIME EMPLOYEES EMPLOYED IN THE PRECEDING FISCAL YEAR IN CONNECTION WITH PROPERTY ACQUISITION, INCLUDING SURVEY, APPRAISAL AND OTHER RELATED ACTIVITIES.

5426 hours were expended by (4) different employees during FY96-97. A total of \$140,444.43 was expended in personal services for those employees involved in surveying and buying property.

6. THE TOTAL NUMBER OF FULL-TIME EMPLOYEES EMPLOYED IN THE PRECEDING FISCAL YEAR FOR THE PROGRAMS LISTED IN SUBSECTIONS A THROUGH E OF THIS SECTION. (Note: the language in this Bill should have read "SUBSECTIONS A through F;" however, this report does reflect all Heritage employees, including those employed in the Public Access Program).

A&B) Identification, Inventory, Acquisition, Protection, and Management of Sensitive Habitat:	25.5 full-time employees
C) Habitat Evaluation and Protection:	16.0 full-time employees
D) Urban Wildlife:	19.5 full-time employees
E) Environmental Education:	5.0 full-time employees
F) Public Access:	2.0 full-time employees
G) Administration and Support:	19.0 full-time employees
H) Total Full-time Heritage-based Employees:	87.0 full-time employees

7. A LIST OF THE GRANTS AWARDED DURING THE PRECEDING FISCAL YEAR INCLUDING INFORMATION ON THE RECIPIENTS, PURPOSES AND AMOUNTS.

See Appendix II for list of grants awarded in FY96-97.

**Parcels Acquired in fiscal year 1996-97  
by the Arizona Game and Fish  
Commission with Heritage Funds**

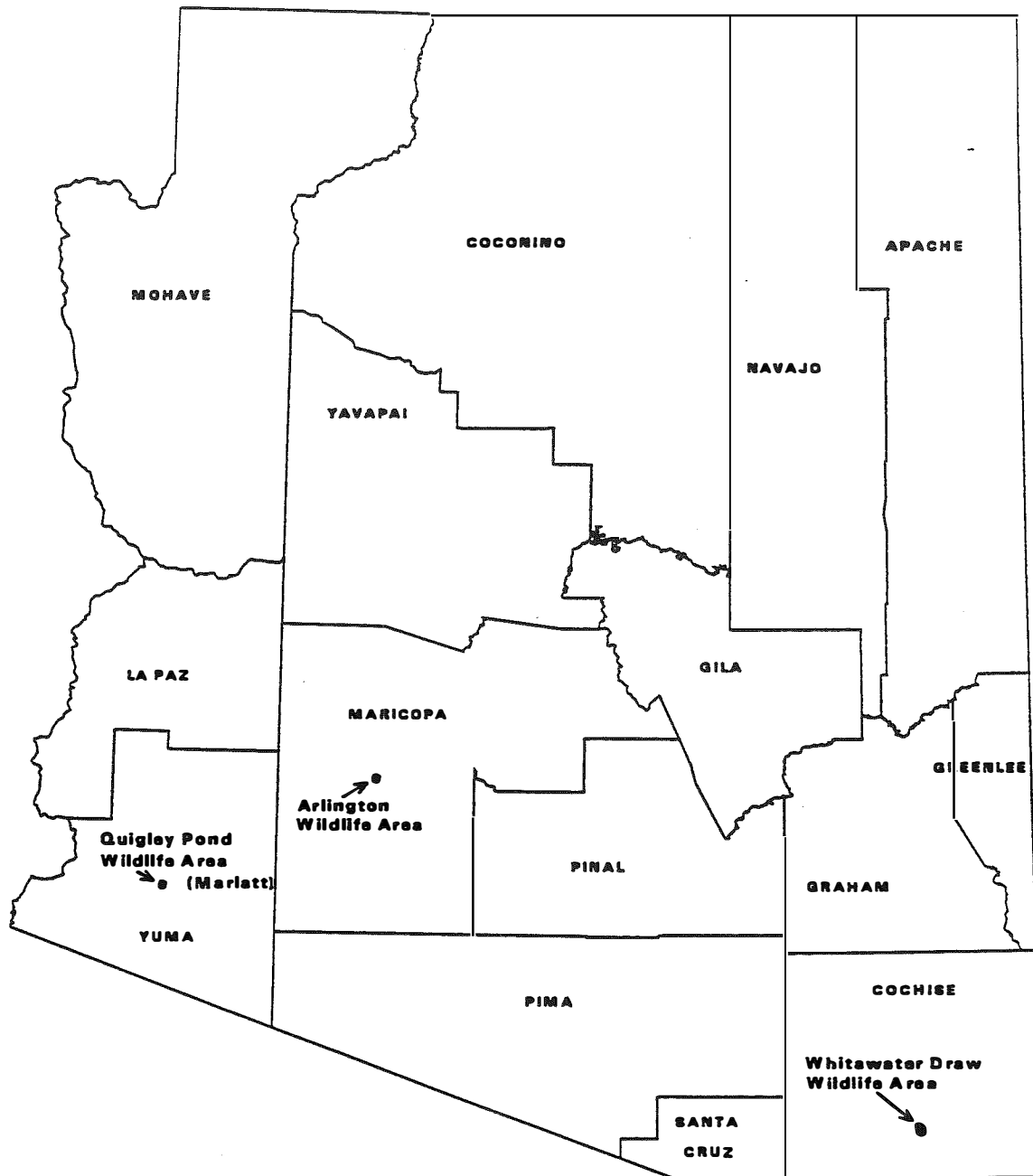


Figure 13. Location of parcels of property acquired during FY96-97.

APPENDIX II: LIST OF HERITAGE GRANTS AWARDED IN FY96-97.

# 1997 HERITAGE GRANT AWARDS

## Environmental Education

Project Number	Project Title	Agency Name/Department
1	E97001	Env. Biology Summer Field Course "BEARBUSTERS" Tempe Union High School District Corona Del Sol High School
2	E97002	Alta Vista Exploration Habitat Center "C.A.C.T.I." Washington Elementary School District Alta Vista School
3	E97003	Buena High School Env. Study Area Curriculum Sierra Vista Public Schools Buena High School
4	E97004	'Ahakhav Tribal Preserve Environmental Curriculum Dev. Colorado River Indian Tribes
5	E97007	Student-directed E.E. Program / Rattlesnakes Tucson Unified School District David T Smith Science Res. Ctr
6	E97010	Grand Canyon School to Work Restoration Project U. S. Department of Interior National Park Service



1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** Tempe Union High School District  
Corona Del Sol High School

**Project #** E97001

**Dollars Awarded:** \$ 5,235.00

**Project Title:** Env. Biology Summer Field Course "BEARBUSTERS"

**Project Contact:** Mike Trimble  
Science Teacher  
1001 E. Knox Road  
Tempe, AZ 85284  
602 752-8814

This project will encompass the development, implementation, and dissemination of a summer field program for use within the TUHS District and in-serviced for applications throughout the educational and scientific community. This program emphasizes issues relating to black bear and students will work alongside Al LeCount and the Hornocker Wildlife Research Institute team, developing investigations regarding ursine natural history and management of bear-human interactions. The student "BEARBUSTERS" team will investigate and provide educational assistance to campground/cabin community within Coronado National Forest. Students will develop a bear-human interaction management plan and the "BEARBUSTERS" Computer Fieldguide to Bears & Human Interactions, as well as present their research findings to a number of public forums. In addition, curriculum development for riparian studies at Date Creek and predator studies in the Huachucas and Four Peaks will be conducted on-site.

1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** Washington Elementary School District  
Alta Vista School

**Project #** E97002

**Dollars Awarded:** \$ 8,153.00

**Project Title:** Alta Vista Exploration Habitat Center "C.A.C.T.I."

**Project Contact:** Linda Fowler  
Librarian  
8710 N. 31st Avenue  
Phoenix, AZ 85051  
602 866-5100

The C.A.C.T.I. (Curriculum And Creative Teaching Innovations) project will bring supplemental environmental teaching materials to our campus to be used in conjunction with the Alta Vista Exploration Habitat Center which is currently under development. All included components in this project will enhance the educational environment our students will explore. We will be constructing our own version of a "bone box" as well as several animal and cacti "kits" to be used as pre-teaching or lab centers for our habitat area. The existing science curriculum will be enhanced by our outdoor environmental education program.

1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** Sierra Vista Public Schools  
Buena High School

**Project #** E97003

**Dollars Awarded:** \$ 4,206.00

**Project Title:** Buena High School Env. Study Area Curriculum

**Project Contact:** Jonathan Bealer  
Science Teacher  
3555 E. Fry Blvd.  
Sierra Vista, AZ 85635  
520 515-2800

This project will allow district staff (K-12) to develop curriculum for our new Environmental Study Area. This would encourage teachers at Buena High School and other schools (eight elementary and three middle schools) in the district to utilize this site. Participants would visit other successful sites to gather ideas. The funds would also enable state of the art equipment to be purchased to accomplish these ends. We would have a county-wide workshop for all interested teachers to obtain and try out the curriculum.

1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** Colorado River Indian Tribes

**Project #** E97004

**Dollars Awarded:** \$ 9,960.00

**Project Title:** 'Ahakhav Tribal Preserve Environmental Curriculum Dev.

**Project Contact:** Fred Phillips  
Project Manager  
Rt. 1 Box 23-B  
Parker, AZ 85344  
520 669-8831

The development of an environmental education curriculum for the 'Ahakhav Tribal Preserve will provide the Colorado River Indian Tribes and the Parker community with a vital resource in their efforts to preserve their natural resources. The curriculum will involve students, teachers, families, and other members of the community in the planning and provision of environmental education programs for students of all ages. The curriculum will emphasize the interaction of habitat and wildlife and provide a tool for learning experiences both inside and outside the Preserve. This curriculum will be the foundation of future programs offered by the Preserve, as well as allow the immediate implementation of many programs during the summer of 1997. An understanding of the importance of natural areas is vital to their preservation, and this curriculum will begin this learning process.

1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** Tucson Unified School District  
David T Smith Science Res. Ctr

**Project #** E97007

**Dollars Awarded:** \$ 7,946.00

**Project Title:** Student-directed E.E. Program / Rattlesnakes

**Project Contact:** Matthew Goode  
Principal Investigator  
2025 E. Winsett  
Tucson, AZ 85719  
520 617-7051

We propose to develop an environmental education program in conjunction with ongoing research on tiger rattlesnake ecology and conservation. This program will be a collaborative effort of Saguaro National Park and Tucson Unified School District Science Resource Center. Teachers and park volunteers will be trained to ensure that the program will be perpetuated into the future, even after AGFD funds are exhausted. The program will consist of a variety of student-driven activities arising from ecological research as it happens. This will provide them with a dynamic learning environment based on real-life situations. Because the program will be district-wide and the park is visited by millions, the project will reach a very large segment of the population.

1997 HERITAGE GRANT AWARDS

Heritage - Environmental Education

**Applicant:** U. S. Department of Interior  
National Park Service

**Project #** E97010

**Dollars Awarded:** \$ 4,500.00

**Project Title:** Grand Canyon School to Work Restoration Project

**Project Contact:** Frank Hayes  
Restoration Specialist  
P O Box 129  
Grand Canyon, AZ 86023  
520 638-7857

We propose establishing a partnership between the National Park Service (NPS) and the Grand Canyon Unified School District (GCUSD) to complete a "School to Work" (STW) habitat restoration project at Grand Canyon National Park. A STW program integrates academic learning with a community service project to develop broad workplace competencies. Students from Grand Canyon High School, with guidance from the NPS revegetation crew and GCUSD teachers, will develop, plan, organize, and implement the restoration project. Other GCUSD students will complete components of the project as directed by the high school students.

## 1997 HERITAGE GRANT AWARDS

**IIPAM (Identification, Inventory, Acquisition, Protection and Management of Sensitive Habitat)**

Project Number	Project Title	Agency Name/Department
1	197001	Hualapai Mexican Vole Studies on Hualapai Indian Res. Hualapai Tribe Hualapai Wildlife Mgmt. Dept.
2	197005	Redmond Cave Bat Gate U. S. Department of Agriculture Tonto National Forest
3	197009	Native Fish Habitat & Ecology: Experimental Stream App. U. S. Department of Agriculture Rocky Mountain Forest and
4	197010	Management of Scrub Grassland Habitat Arizona State University, Board of Regents Office of Research & Creative
5	197011	MHC Variation in Topminnows & Resistance to Parasitic Arizona State University, Board of Regents Department of Zoology
6	197015	Southwestern Willow Flycatcher Surveys Hualapai Tribe
7	197019	Microsatellite Variation in Massasauga Arizona State University, Board of Regents Office of Research and
8	197021	Flannelmouth Sucker Genetics in Grand Canyon Arizona State University, Board of Regents Office of Research and
9	197023	Bat Habitat Protection at the Betty Lee Cistern Mine U. S. Department of Interior Bureau of Land Management
10	197026	Field Test/Landscape Model/Mex. Spotted Owl Habitat Northern Arizona University, Board of Regents Colorado Plateau Research Sta.
11	197039	Cowbirds and Host Reproductive Success University of Arizona, Board of Regents School of Renewable Nat'l Res.
12	197040	Comp. Study Hunted / Unhunted Twin-Spotted Rattlesnake University of Arizona, Board of Regents Sponsored Projects Services

## 1997 HERITAGE GRANT AWARDS

IIPAM (Identification, Inventory, Acquisition, Protection and  
Management of Sensitive Habitat)

Project Number	Project Title	Agency Name/Department
13	197041	Bullfrog Impacts on Native Wetland Herpetofauna University of Arizona, Board of Regents School of Renewable Nat'l Res.
14	197042	Herpetological Survey of the Whetstone Mountains University of Arizona, Board of Regents School of Renewable Nat'l Res.



1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** Hualapai Tribe  
Hualapai Wildlife Mgmt. Dept.

**Project #** I97001

**Dollars Awarded:** \$32,306.00

**Project Title:** Hualapai Mexican Vole Studies on Hualapai Indian Res.

**Project Contact:** Ryan Riley  
Program Manager  
P.O. Box 300  
Peach Springs, AZ 86434-0300  
520 769-2255

This study will assess population status, describe habitat characteristics and examine the effects of forestry management activities on the endangered Hualapai Mexican Vole on the Hualapai Indian Reservation. We propose to install live trap transects and perform vegetation surveys in forest compartments before and after management activities including timber harvests and prescribe burns to estimate population size, distribution, habitat qualities and compare vole abundances within and outside forestry compartments. Finally, we will provide specimens for previously initiated genetic analysis aimed at defining the taxonomic status of the species of concern.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** U. S. Department of Agriculture  
Tonto National Forest

**Project #** I97005

**Dollars Awarded:** \$ 4,000.00

**Project Title:** Redmond Cave Bat Gate

**Project Contact:** Deborah Lutch  
Wildlife Biologist  
1009 E. Hwy 260  
Payson, AZ 85541  
520 474-7900

A bat gate will be installed on Redman (Redmond) Cave, located on the Pleasant Valley Ranger District of the Tonto National Forest. This cave is known to support a maternity roost of fringed Myotis (*Myotis thysanodes*). On the basis of five years of monitoring data, it appears that the number of bats at the roost is declining. Recreational use is thought to be the primary cause for the decline. A preliminary report (attached) has been done by a consultant to determine the best method to accomplish the project. The cave will require one gate positioned just inside the cave entrance. A seasonal closure will remain in effect following gating, so entry into the cave will be restricted from March - October.

1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** U. S. Department of Agriculture  
Rocky Mountain Forest and

**Project #** 197009

**Dollars Awarded:** \$23,250.00

**Project Title:** Native Fish Habitat & Ecology: Experimental Stream App.

**Project Contact:** John Rinne  
Research Fisheries Biologist  
2500 S. Pine Knoll Dr.  
Flagstaff, AZ 86001  
520 556-2181

Most information on native Arizona fishes has been obtained from the wild. Often, empirical and observational data need refinement and corroboration under controlled conditions. Laboratory experimentation, however, can readily be criticized as unnatural and artificial. This proposal is designed to 1) construct an outdoor, "natural" experimental stream environment and 2) conduct several experiments on native fish biology and ecology in the created, controllable environment. Multiple, replicated experiments on habitat use, interactions of native and introduced fishes, and response to flood events and drought in a near natural setting will be possible to conduct in this stream environment.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** Arizona State University, Board of Regents  
Office of Research & Creative

**Project #** I97010

**Dollars Awarded:** \$61,768.00

**Project Title:** Management of Scrub Grassland Habitat

**Project Contact:** Julie Stromberg  
Assistant Research Professor  
Box 871603  
Tempe, AZ 85287-1603  
602 965-0864

This research plan will evaluate the potential of abandoned agricultural fields for restoration to wildlife habitat provided by giant sacaton (*Sporobolus wrightii*) grasslands and scrublands. Giant sacaton communities harbor a wide array of wildlife, including several species listed by the Arizona Game and Fish Department as sensitive elements in need of habitat enhancements, or as resource issues. Sacaton grasslands were abundant in the southwest before the turn of the century but today cover less than 5% of their historical extent as native vegetation was cleared for agricultural use. Thousands of acres of agricultural fields on former grassland-scrubland have been abandoned and are lying fallow. To establish guidelines and management strategies that will enhance recovery of wildlife habitat on these abandoned agricultural fields, we will determine the ecological variables and process regulating and influencing existing and former giant sacaton communities.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** Arizona State University, Board of Regents  
Department of Zoology

**Project #** I97011

**Dollars Awarded:** \$44,867.00

**Project Title:** MHC Variation in Topminnows & Resistance to Parasitic

**Project Contact:** Timothy Kim  
Ph. D. Candidate

Tempe, AZ 85287-1501  
602 965-4556

A critical threat to endangered species is exposure to pathogens introduced by non-native species. This research will provide useful information for the conservation of the endangered Gila topminnow and increase the general knowledge of host/parasite genetics which is critical for future conservation efforts. The purpose of this project is to: (1) Assess the genetic diversity of MHC genes in the four topminnow stocks maintained at ASU and in 15 inbred lines. (2) Determine the resistance of topminnows from the stocks to the common guppy parasite, Gyrodactylus. (3) Determine the extent of MHC related resistance within populations. (4) Determine the relative effects of MHC genotypes and inbreeding on parasite resistance. Recommendations will be made for the future management of the Gila topminnow.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** Hualapai Tribe

**Project #** 197015

**Dollars Awarded:** \$14,706.00

**Project Title:** Southwestern Willow Flycatcher Surveys

**Project Contact:** Ryan Riley  
Wildlife Biologist/Manager  
P.O. Box 179  
Peach Springs, AZ 86434-0179  
520 769-2255

This study will assess population status, distribution and describe habitat requirements of the endangered Southwestern Willow Flycatcher on the Hualapai Indian Reservation. We propose to conduct willow flycatcher surveys at 12 designated sites from Separation Canyon to Scorpion Springs along the Colorado River in the Grand Canyon. If detected, we will estimate abundance, distribution and nesting habitat requirements of the species of concern.

1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** Arizona State University, Board of Regents  
Office of Research and

**Project #** I97019

**Dollars Awarded:** \$19,900.00

**Project Title:** Microsatellite Variation in Massasauga

**Project Contact:** Michael Douglas  
Full Curator

Tempe, AZ 85287-1603  
602 965-3571

This project will evaluate genetic variability, levels of inbreeding and divergence in currently isolated populations of desert massasauga, a state endangered species, using microsatellite DNA loci. These genetic parameters, (along with natural history and demographic data from a previous IIPAM Heritage Fund study) will be used to critically evaluate population viability. Such parameters are crucial to analysis of status and generation of management recommendations for remaining viable massasauga populations in Arizona.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** Arizona State University, Board of Regents  
Office of Research and

**Project #** I97021

**Dollars Awarded:** \$30,000.00

**Project Title:** Flannelmouth Sucker Genetics in Grand Canyon

**Project Contact:** Michael Douglas  
Full Curator

Tempe, AZ 85287-1603  
602 965-3571

Genetic diversity of threatened flannelmouth sucker (*Catostomus latipinnis*) will be assessed in upper/middle Grand Canyon by comparing 20 adults/juveniles each from 6 populations [Lee's Ferry (RM -4.1); Paria (RM 1); Little Colorado (RM 61.5); Shinumo (RM 108.5); Kanab (RM 143.5); Havasu (RM 156.8)]. All 240 fish will be sequenced at 3 mtDNA loci (ND4L, D-loop, and ATPase). Distinctiveness of juveniles and adults will be tested within -/among populations. Data are critical to management of both suckers and trout at Lee's Ferry.



1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** U. S. Department of Interior  
Bureau of Land Management

**Project #** I97023

**Dollars Awarded:** \$ 6,070.00

**Project Title:** Bat Habitat Protection at the Betty Lee Cistern Mine

**Project Contact:** Susanna Henry  
Wildlife Biologist  
2555 Gila Ridge Road  
Yuma, AZ 85365  
520 317-3211

We would like to protect an important bat roost in the Copper Mountains on the Barry M. Goldwater Air Force Range from human disturbance. This bat roost has been identified as a priority site for protection in a survey of mines and bats completed in 1994. The roost is used by California leaf-nosed bats (*Macrotus californicus*) and little brown bats (*Myotis* spp.). The protection would consist of two steel bat-accessible gates inside the entrances of two horizontal mine adits. The project would ensure that the bats remain undisturbed while providing safety both to public visitors and to military personnel.

1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** Northern Arizona University, Board of Regents  
Colorado Plateau Research Sta.

**Project #** I97026

**Dollars Awarded:** \$25,286.00

**Project Title:** Field Test/Landscape Model/Mex. Spotted Owl Habitat

**Project Contact:** David Willey  
Research Specialist  
Box 5614  
Flagstaff, AZ 86011  
520 556-7466

We will conduct field tests of our landscape model that predicts the distribution of suitable breeding habitat in canyonlands type landscape in northern Arizona. We will use field surveys (point calling stations) to assess spotted owl occupancy within three habitat types: prime breeding habitat, marginal habitat, and non-breeding habitat.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** 197039

**Dollars Awarded:** \$11,640.00

**Project Title:** Cowbirds and Host Reproductive Success

**Project Contact:** Michael Morrison  
Adjunct Associate Professor  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-8075

This project will enhance the ability of AGFD personnel to restore declining populations of Threatened and Native Nongame Wildlife. This will be accomplished by providing (1) determination of the direct effects that cowbird removal has on the rate of nest parasitism and host reproductive success in riparian forests, (2) documentation of the cost/benefit ratio of initiating a cowbird control program as part of a riparian-habitat restoration program, and (3) evaluation of restoration sites for cowbird parasitism and determination of the necessity of cowbird control programs for these sites. The Bill William and Havasu National Wildlife Refuges will serve as study sites. This project represents a cooperative effort between AGFD, Bureau of Reclamation and U.S. Fish and Wildlife Service.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** University of Arizona, Board of Regents  
Sponsored Projects Services

**Project #** 197040

**Dollars Awarded:** \$37,127.00

**Project Title:** Comp. Study Hunted / Unhunted Twin-Spotted Rattlesnake

**Project Contact:** Matthew Goode  
Principal Investigator  
Sun Bldg  
Tucson, AZ 85721  
520 626-6230

This study will examine the effect of collecting activities on twin-spotted rattlesnakes, a protected montane species with a very limited distribution. Our hunted population will be the talus slides of Barfoot Park, a nationally known collecting locality. We will compare the abundance, demographics, survival, and activity between Barfoot and relatively unhunted populations of this snake in more-remote areas of the Chiricahua Mountains. We will quantify hunting pressure through analysis of habitat alteration, time-lapse photography, and observations. We will use radio-telemetry, mark-resighting and analysis of prey (mtn. spiny lizards) to determine differences between populations.

1997 HERITAGE GRANT AWARDS

Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** I97041

**Dollars Awarded:** \$37,724.00

**Project Title:** Bullfrog Impacts on Native Wetland Herpetofauna

**Project Contact:** Carol Wakely  
Business Manager  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-7261

This is a proposal for ecosystem management to benefit native Chiricahua leopard frogs, Mexican garter snakes, as well as threatened and endangered fishes at and near San Bernardino NWR (SBNWR). Native frogs and garter snakes are declining in southeastern Arizona, due in large part to introduced species, especially bullfrogs, which are particularly difficult to eradicate. Due to an exotic parasite in native fishes at SBNWR, we will have the unique opportunity to fence and dry ponds, re-establish new fenced ponds, and repopulate these solely with native species. Other project aspects (additional bullfrog removal, native species monitoring, cooperation with ranchers) will also continue. This work has funding collaboration of AGFD, USFWS, and USGS (Biological Survey). It contributes to the debate regarding causes of frog declines, and will exemplify a new kind of ecosystem management for arrays of native species.

1997 HERITAGE GRANT AWARDS

**Heritage - IIPAM (Identification, Inventory, Acquisition,  
Protection and Management of Sensitive Habitat)**

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** I97042

**Dollars Awarded:** \$49,870.00

**Project Title:** Herpetological Survey of the Whetstone Mountains

**Project Contact:** Dale Turner  
Graduate Student  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-5508

This project will inventory the herpetofauna of the Whetstone Mountains, focusing primarily on the 70-square-mile block of Forest Service land. It will include gathering information about all reptile and amphibian species found, and will provide distribution and population status of all special-status species, including up to six species from the Threatened Native Wildlife list and up to 11 species from the Forest Service Sensitive Species list. Methods include extensive and intensive field surveys, along with a review of existing collection data.

## 1997 HERITAGE GRANT AWARDS

Public Access
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Project Number	Project Title	Agency Name/Department
1	P97001	Unit 10 Access Map Arizona Game & Fish Department Region 3
2	P97002	Barrier-Free Trail - Desert Outdoor Center Maricopa County Recreation Services Department
3	P97003	Barrier-Free Trail - McDowell Mountain Regional Park Maricopa County Recreation Services Department
4	P97004	Rattlesnake Barrier-Free Dock U. S. Department of Agriculture Tonto National Forest
5	P97007	Reservation Lake Parking Area and Boat Ramp White Mountain Apache Tribe Game and Fish Department
6	P97008	Construction of 3 Boat Ramps - Ft. Apache Indian Res. White Mountain Apache Tribe Game and Fish Department
7	P97010	Bear Creek Riparian Enhancement - Phase 1 U. S. Department of Agriculture Coronado National Forest

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** Arizona Game & Fish Department  
Region 3

**Project #** P97001

**Dollars Awarded:** \$10,000.00

**Project Title:** Unit 10 Access Map

**Project Contact:** Tim Pender  
Wildlife Manager  
5325 N. Stockton Hill Rd.  
Kingman, AZ 86401  
520 422-3304

The Unit 10 Access Map is a compilation of information gathered from a number of maps, ranchers, locals, and staff. Presently, there is no single map that covers all of Game Management Unit 10. The map will be a great benefit to the consumptive and non-consumptive users of GMU 10. The initial printing of this map is a pilot project for statewide game management unit mapping. The map will be sold statewide.



1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** Maricopa County  
Recreation Services Department  
**Third Party:**

**Project #** P97002

**Dollars Awarded:** \$49,825.00

**Project Title:** Barrier-Free Trail - Desert Outdoor Center

**Project Contact:** Bob Skaggs  
Trails Planner  
3475 W. Durango Street  
Phoenix, AZ 85009  
602 506-2930

Construction of trail to barrier-free specifications and installation of interpretive displays as part of the Desert Outdoor Center facilities at Lake Pleasant Regional Park. The trail will be approximately 6,000 feet (1.1 mi) in length and will provide recreational and educational opportunities for all visitors and participants attending the DOC. Construction will follow specifications in the Maricopa County Trails Manual and The Americans with Disabilities Act, as applicable.

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** Maricopa County  
Recreation Services Department

**Project #** P97003

**Dollars Awarded:** \$18,550.00

**Project Title:** Barrier-Free Trail - McDowell Mountain Regional Park

**Project Contact:** Julie Allbrooks  
Grant Preparer  
3475 W. Durango Street  
Phoenix, AZ 85009  
602 506-2930

Construction of a barrier-free trail at McDowell Mountain Regional Park. The constructed trail will be built according to specifications set in the Maricopa County Trails Manual and the Americans with Disabilities Act, as applicable. The trail will be approximately 1,700 feet in length and will provide recreational and educational opportunities for all visitors to the park. The trail location and educational opportunities are for all visitors to the park. The trail location offers panoramic views of the Four Peaks, McDowell Mountain, Verde River, Upper Sonoran Desert and the 1995 Rio Fire. There will be interpretive displays along the trail highlighting the interaction of wildlife, vegetation and fire in the Upper Sonoran Desert ecosystem.

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** U. S. Department of Agriculture  
Tonto National Forest

**Third Party:**

**Project #** P97004

**Dollars Awarded:** \$30,000.00

**Project Title:** Rattlesnake Barrier-Free Dock

**Project Contact:** Todd Willard  
Fisheries Biologist  
7171 E. Cave Creek Rd.  
Carefree, AZ 85377  
602 488-3441

Construction of barrier-free floating fishing dock. This project is part of the Bartlett Warmwater Fish Habitat Improvement Project which is a comprehensive plan to place fish habitat structures in 39 sites within the lake. Rattlesnake Recreation Site is in the final phase of construction which includes: ramadas, grills, flush toilets, additional parking, and potable water. The Cave Creek District constructed a hard surfaced barrier-free trail to the dock entrance two years ago. The trail construction was made possible by a previous Heritage Grant #P93021. The Rattlesnake Recreation Site and dock will be the first barrier-free facilities on the Cave Creek Ranger District.

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** White Mountain Apache Tribe  
Game and Fish Department

**Project #** P97007

**Dollars Awarded:** \$20,700.00

**Project Title:** Reservation Lake Parking Area and Boat Ramp

**Project Contact:** Kelly Meyer  
Fish Biologist  
P O Box 220  
Whiteriver, AZ 85941  
520 338-4385

A boat ramp and parking area is needed at Reservation Lake. We propose making a new parking area (150 X 150), an 800 foot access road and a 60 foot concrete ramp. This facility will be east of the present store.

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** White Mountain Apache Tribe  
Game and Fish Department

**Third Party:**

**Project #** P97008

**Dollars Awarded:** \$15,100.00

**Project Title:** Construction of 3 Boat Ramps - Ft. Apache Indian Res.

**Project Contact:** Kelly Meyer  
Fish Biologist  
P O Box 220  
Whiteriver, AZ 85941  
520 338-4385

Boat ramps are needed at Big Bear, Cyclone and Hurricane Lakes. We propose constructing 60 foot concrete ramps at all lakes. Ramps at Big Bear and Cyclone will need fill brought in to raise the ramp to an appropriate grade.

1997 HERITAGE GRANT AWARDS

Heritage - Public Access

**Applicant:** U. S. Department of Agriculture  
Coronado National Forest

**Third Party:**

**Project #** P97010

**Dollars Awarded:** \$74,878.00

**Project Title:** Bear Creek Riparian Enhancement - Phase I

**Project Contact:** Cathy Kahlow  
Recreation Staff  
300 W. Congress  
Tucson, AZ 85701  
520 378-0311

This project will improve riparian conditions while permitting public access to a portion of Bear Creek in the Huachuca Mountains. Included in the project are construction of two (6 to 8 car) parking areas, installation of access gates, construction of fence to restrict vehicle travel and livestock use, installation of 500 feet of roadside barriers, placement of log reinforced steps, rehabilitation of compacted areas and placement of information signs.

## 1997 HERITAGE GRANT AWARDS

Schoolyard Grants
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Project Number	Project Title	Agency Name/Department
1	S97002	Globe Hills Habitat/Environment Studies Globe Unified School District Copper Rim Elem. School
2	S97004	SCC Wildlife Demonstration Gardens Maricopa Community College District Scottsdale Community College
3	S97005	Winslow High School Schoolyard Habitat Winslow Unified School District Winslow High School
4	S97007	A School Site to Save the Future Mammoth-San Manuel Public Schools Gardner Middle School
5	S97008	Desert Harbor Wildlife Habitat Peoria Unified School District Desert Harbor Elem. School
6	S97009	Mountain View Outdoor Study Area Washington Elementary School District Mountain View Elem. School
7	S97010	Tsaile School Mini Habitat Study Areas Chinle Unified School District Tsaile Public School
8	S97011	Hendrix Outdoor Study Area (HODSA) Mesa Public School District Hendrix Junior High School
9	S97014	"Young Naturalist Garden" Altar Valley School District Mary E. Dill Primary School

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Globe Unified School District  
Copper Rim Elem. School

**Project #** S97002

**Dollars Awarded:** \$ 5,644.00

**Project Title:** Globe Hills Habitat/Environment Studies

**Project Contact:** Pamela Castner  
Gifted Education Coordinator  
501 Ash Street  
Globe, AZ 85501  
520 425-3211

"Globe Hills" project will be available for all grade levels and any subjects that are relevant to the area. The community and other school districts in the area will be encouraged to use the facilities. The facilities consist of a Habitat Trail that will wind down a hill of native cactus, wild flowers and shrubs. At the base of the hill will be an outdoor classroom and observation area with log benches. This area will be used for research, workshops, lectures and seminars on habitat / environment. A bridge will cross the wash leading to the established "Round Mountain Park" where additional habitat research can be collected. All data will be processed and computed on a computer located in the Copper Rim Library where the necessary software will be stored. This computer will be set aside for scientific studies.



1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Maricopa Community College District  
Scottsdale Community College

**Project #** S97004

**Dollars Awarded:** \$ 7,458.00

**Project Title:** SCC Wildlife Demonstration Gardens

**Project Contact:** Roy Barnes  
Professor of Biology  
9000 E. Chapparal Road  
Scottsdale, AZ 85250-2614  
602 423-6034

This project includes the construction of a 3-part "Wildlife Demonstration Gardens" on the campus of Scottsdale Community College. The project will include the construction of new and the remodeling of older xeriscaped areas of the SCC campus to: 1) benefit native wildlife species; 2) promote native plant species and biodiversity; 3) serve as an outdoor laboratory for biology classes, and 4) provide a self-guided tour experience for the citizens of Scottsdale, AZ.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Winslow Unified School District  
Winslow High School

**Project #** S97005

**Dollars Awarded:** \$ 5,000.00

**Project Title:** Winslow High School Schoolyard Habitat

**Project Contact:** Doug Watson  
Science Department Chairman  
P O Box 580  
Winslow, AZ 86047  
520 289-4939

This is to be an Arizona schoolyard habitat designed, built, and managed by high school science students. It will feature a pond and stream (aquatic environment) as well as landscaping with native Arizona plants. Students will raise fish, monitor the environment, and make necessary changes to keep organisms and the ecosystem in balance. This habitat will be used to teach the students at Winslow Jr. High and local elementary schools about Arizona's ecosystems.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Mammoth-San Manuel Public Schools  
Gardner Middle School

**Project #** S97007

**Dollars Awarded:** \$ 3,427.00

**Project Title:** A School Site to Save the Future

**Project Contact:** Linda Archuleta  
Science Teacher 7th Grade  
P O Box 406  
San Manuel, AZ 85741  
520 385-2335

The goal of this proposal is to turn an existing walled courtyard area into a habitat for desert plants, desert wildlife and people of the school and community. The ultimate environmental goal is to teach the young who will grow into knowledgeable adults that take responsibility for preserving the wildlife desert ecology. Cavity bird houses, and bat houses will reduce the high number of species killed needlessly due to human intervention around the school. The desert courtyard will serve as a desert plant nursery and safe haven for desert insects, birds, amphibians and reptiles. The desert courtyard will be the focal point for desert ecology instruction and preservation for students and community members.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Peoria Unified School District  
Desert Harbor Elem. School

**Project #** S97008

**Dollars Awarded:** \$10,000.00

**Project Title:** Desert Harbor Wildlife Habitat

**Project Contact:** Jane Coady  
Principal  
15585 North 91st Avenue  
Peoria, AZ 85382  
602 486-6200

In collaboration with the City of Peoria, a one-acre parcel of land adjacent to the park has been donated to Desert Harbor Elementary to develop an outdoor desert wildlife habitat. In addition to a tree-shaded outdoor classroom area, the habitat will include a pathway circling through two main ecosystems: riparian and Sonoran desert terrain. The riparian area will include a waterfall and 40' stream leading to a 20' x 30' pond with appropriate plants and animals for the zone. The remainder of the acre will be composed of desert terrain hills and representative flora and fauna of the Sonoran desert. Various plants will be identified by signs throughout the habitat with both common and scientific names. A student habitat club has been organized to research, design, construct, and maintain this project. Students will continue to conduct research to determine which native plants attract particular animals and insects. Students will be trained to serve as docents providing informative tours.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Washington Elementary School District  
Mountain View Elem. School

**Project #** S97009

**Dollars Awarded:** \$ 3,300.00

**Project Title:** Mountain View Outdoor Study Area

**Project Contact:** Dianna Bonney  
Teacher  
1502 W. Mountain View Road  
Phoenix, AZ 85021  
602 866-5232

The proposed Mtn. View Outdoor Study Area will be an open-air classroom-lab in which students may study Sonoran Desert habitats and ecosystems. This 3-part project involves students in renovating an existing cactus garden, building a mock archaeological site, and converting a bermuda area to riparian-type habitat. Upper grade students are currently engaged in Phase I renovations of cactus garden; repairing paths, trimming cacti, planting trees. Phase II will have students constructing stone-walled "Hohokam ruins" in Spring, 1997. Phase III will be the proposed riparian habitat, including a dry wash of river rock and granite, two wooden plank crossings, and planting of trees and shrubs typically found in desert washes.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Chinle Unified School District  
Tsaile Public School

**Project #** S97010

**Dollars Awarded:** \$ 6,870.00

**Project Title:** Tsaile School Mini Habitat Study Areas

**Project Contact:** Linda Peterson  
Teacher/Director of Dev.  
P O Box 587  
Chinle, AZ 86503  
520 724-3331

Four mini habitats with interpretive signage will be constructed: a pond, a wetland, a canyon wall and an area of typical high open dryland. The pond area is approximately 60' by 75' and the wetland area will extend from the pond for about 100 to 120 feet. The "canyon floor" will be landscaped with cottonwood trees and shrubs native to the floors of local canyons. The "canyon floor" will broaden into an area populated by plant species found at the mouth of a canyon with a stream. An outdoor amphitheater will be in this area. A wide variety of species will be served by the habitat. Upon completion, the habitats will serve as learning labs for: 1) all K-8 students who attend Tsaile Elem. School, 2) an extension campus for Navajo Community College to use in teaching science methods courses, and 3) parents and the general public to attend workshops and classes teaching traditional Navajo cultural wisdom in the use of native plants as well as environmental awareness and action planning to preserve or rehabilitate the land.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Mesa Public School District  
Hendrix Junior High School

**Project #** S97011

**Dollars Awarded:** \$10,000.00

**Project Title:** Hendrix Outdoor Study Area (HODSA)

**Project Contact:** Larry Langstaff  
Science Teacher  
1550 W. Summit Place  
Chandler, AZ 85224  
602 345-2971

On an area about 110' x 110' on the west side of our school, we will design, construct and maintain a desert habitat for plants and animals. Science, social studies, and agriculture classes will construct the site. Research and observation in the future will be done by all science classes and any other subject areas in the school that show an interest in the area. Once baseline data is recorded, the site will be used to compare continuous growth and change of plants and animals in the area. Knowledge about planting, adaptations, and interrelationships of desert plants and animals will develop in all students involved in the site.

1997 HERITAGE GRANT AWARDS

Heritage - Schoolyard Grants

**Applicant:** Altar Valley School District  
Mary E. Dill Primary School

**Project #** S97014

**Dollars Awarded:** \$ 7,900.00

**Project Title:** "Young Naturalist Garden"

**Project Contact:** Patricia Riggs  
Principal  
HCR01 Box 130  
Tucson, AZ 85731  
520 822-5132

The Mary E. Dill Primary School will spearhead the development of a "Young Naturalist Garden" where young children will be introduced to their natural surroundings through the integration of regular curriculum with natural surroundings. Curriculum will be developed and community involvement will be encouraged. The completed garden will provide not only an educational opportunity for students, staff and community, but will also provide a serene place honoring nature and the area's ecological system.



## 1997 HERITAGE GRANT AWARDS

Urban Wildlife and Urban Wildlife Habitat
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Project Number	Project Title	Agency Name/Department
1	U97001	Green Valley Park, Lake Signage Town of Payson
2	U97002	Chuckwalla Lizards in Urban Mountain Preserves Arizona State University, Board of Regents Office of Research & Creative
3	U97004	Distribution & Habitat of Roadrunners in Tucson University of Arizona, Board of Regents School of Renewable Nat'l Res.
4	U97005	Ecology of Urban Coyotes in Tucson, AZ University of Arizona, Board of Regents School of Renewable Nat'l Res.
5	U97006	Wildlife Inventory of Sweetwater Wetlands University of Arizona, Board of Regents School of Renewable Nat'l Res.
6	U97007	Atturbury Wash Wildlife Sanctuary Interpretive Dev. City of Tucson Parks & Recreation Department
7	U97008	San Pedro House Urban Wildlife Landscaping U. S. Department of Interior Bureau of Land Management
8	U97010	Mesquite Bosque & Urban Wildlife Habitat University of Arizona, Board of Regents College of Agriculture
9	U97011	Cheshire Park Habitat Pond City of Flagstaff
10	U97012	Raptor Electrocution Workshop U. S. Department of Energy Western Area Power Admin.
11	U97013	Red Mountain Park Environmental Kiosk City of Mesa Parks, Recreation and Cultural
12	U97014	Attracting Desert Birds: A Practical Approach University of Arizona, Board of Regents School of Renewable Nat'l Res.

# 1997 HERITAGE GRANT AWARDS

Urban Wildlife and Urban Wildlife Habitat
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Project Number	Project Title	Agency Name/Department
13	U97015	Rattlesnakes and Urban Development: A Management Plan University of Arizona, Board of Regents Sponsored Projects Services

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** Town of Payson

**Project #** U97001

**Dollars Awarded:** \$11,530.00

**Project Title:** Green Valley Park, Lake Signage

**Project Contact:** William Schwind  
Parks and Recreation Director  
303 N. Beeline Highway  
Payson, AZ 85541  
520 474-5242

Develop and install interpretive signs around the lake system throughout Green Valley Park denoting the rules and regulations of the urban fishing program as well as information about the specific species of fish within the lakes.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** Arizona State University, Board of Regents  
Office of Research & Creative

**Project #** U97002

**Dollars Awarded:** \$31,070.00

**Project Title:** Chuckwalla Lizards in Urban Mountain Preserves

**Project Contact:** Brian K. Sullivan  
Associate Professor  
Box 871603  
Tempe, AZ 85287-1603  
602 543--602

The proposed project will provide data on the density, home size, and habitat usage of chuckwalla lizards (*Sauromalus*) occurring within two mountain preserves in Maricopa County: Lookout Mountain Preserve and South Mountain Park. Observations on population levels will provide vital information on the status of these lizards, and radio-telemetry data will allow a characterization of home range size and habitat usage in relation to habitat quality. This will allow for future monitoring of these populations in the face of increasing urbanization and potential pressure from reptile collectors, and provide a baseline against which any shifts in population structure and habitat quality can be judged.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** U97004

**Dollars Awarded:** \$ 6,000.00

**Project Title:** Distribution & Habitat of Roadrunners in Tucson

**Project Contact:** Carol Wakely  
Business Manager  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-7261

The influence of urban development on wildlife populations is a relatively new aspect of wildlife research and management. The Tucson Basin has experienced rapid and widespread growth in recent years. Despite the massive changes in landscape patterns, many wildlife species continue to live within or adjacent to Tucson. The greater roadrunner (*Geococcyx californianus*) is one such species. I propose to use call surveys, nest searches, and assistance from local birding groups and residents to identify areas of occupation by roadrunners in and around Tucson, to use (GIS) data to examine land-use patterns and compare human-created and natural features within roadrunner territories, and to develop a predictive model to determine the natural features and tolerance limits to human occupation that best describe roadrunner habitat within an urban-suburban environment. This information will be useful in understanding the habitat requirements of roadrunners, and urbanization and its effects on wildlife populations.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** U97005

**Dollars Awarded:** \$21,928.00

**Project Title:** Ecology of Urban Coyotes in Tucson, AZ

**Project Contact:** Martha Grinder  
Graduate Student  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-3361

In recent years, coyotes have become abundant inhabitants of urban centers such as Tucson. No studies have documented the ecology of these canids in such nontraditional habitats. I propose to investigate aspects of the ecology of urban coyotes in Tucson. My primary objective is to determine home-range size and habitat use within the home-range by radiocollaring resident coyotes throughout Tucson. My second objective is to assess the occurrence and prevalence of some diseases in urban coyotes by taking blood samples from all trapped coyotes, and analyzing the samples for evidence of disease. Finally, I propose to devise a long-term monitoring scheme that can be used to evaluate changes in the relative abundance of urban coyotes.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** U97006

**Dollars Awarded:** \$14,500.00

**Project Title:** Wildlife Inventory of Sweetwater Wetlands

**Project Contact:** Douglas Henley  
Graduate Student  
325 Biological Sciences East  
Tucson, AZ 85721  
520 575-6474

This project will investigate and document the diversity of wildlife species utilizing the newly created Sweetwater Wetlands Treatment Facility in Tucson, Arizona. Furthermore, it will determine density estimates for breeding and wintering birds using bird counting points; determine abundance estimates for small mammals, reptiles and amphibians; describe baseline conditions at the site prior to construction; compare general wildlife usage patterns between areas receiving concentrated public visitation and those areas receiving little or no visitation; and establish permanent monitoring points and transects for long-term survey projects.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** City of Tucson  
Parks & Recreation Department

**Project #** U97007

**Dollars Awarded:** \$ 5,862.00

**Project Title:** Atturbury Wash Wildlife Sanctuary Interpretive Dev.

**Project Contact:** Luis Lara, Jr.  
Landscape Architect  
900 S. Randolph Way  
Tucson, AZ 85716  
520 791-4873

The Atturbury Wash is one of the few remaining riparian areas left within the city of Tucson and we feel an urgency in preserving this area as the beginning steps of building a bird and animal sanctuary. Lincoln Regional Park is the home to a multitude of wildlife threatened by the human use and misuse associated with urbanization. This sanctuary will provide a safe, comfortable haven for the animals and community to enjoy simultaneously. It will provide an 'outdoor' experience for the novice and the more experienced outdoor person. The interpretive goal of this project is to introduce humans to the proper way to interact with their natural environment in a coexistent and non-destructive manner. The trail will provide, through the interpretive signs requested in this grant application, a self guided tour of the unique riparian habitat that will include birds, animals, cacti and vegetation. The objective of these signs is for the education of the user who is not familiar with riparian areas and associated wildlife.



1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** U. S. Department of Interior  
Bureau of Land Management

**Project #** U97008

**Dollars Awarded:** \$16,675.00

**Project Title:** San Pedro House Urban Wildlife Landscaping

**Project Contact:** Dorothy Morgan  
Outdoor Recreation Planner  
1763 Paseo San Luis  
Sierra Vista, AZ 85635  
520 458-3559

Native plants that are beneficial to wildlife will be planted in the vicinity of the San Pedro House bookstore and adjacent picnic area and trail head. The area will be used to demonstrate to the public how very attractive landscaping can also be beneficial to wildlife and use little water.

## 1997 HERITAGE GRANT AWARDS

### Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
College of Agriculture

**Project #** U97010

**Dollars Awarded:** \$ 5,975.00

**Project Title:** Mesquite Bosque & Urban Wildlife Habitat

**Project Contact:** Cynthia Flynn  
Director  
4210 N. Campbell Avenue  
Tucson, AZ 85719  
520 626-5181

'Our Yard' -- A Landscape Learning Center, is to be developed as an outdoor classroom with the goal of illustrating Cooperative Extension landscape and conservation programs to the general public, incorporating a sustainable public landscape compatible with our arid climate that includes the innovative use and regeneration of natural resources. The intent is to create a stimulating environment with changeable exhibits and self-directed experiential centers for all ages. Research, public education, and aesthetic quality are all important considerations. In addition to the Mesquite Bosque & Urban Wildlife display, permanent demonstrations will include a recycling garden, a climate modification exhibit, a soil erosion control exhibit and a xeriscape demonstration garden.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** City of Flagstaff

**Project #** U97011

**Dollars Awarded:** \$13,000.00

**Project Title:** Cheshire Park Habitat Pond

**Project Contact:** Michael Conner  
Parks Project Manager  
211 W. Aspen  
Flagstaff, AZ 86001  
520 779-7690

The project provides for the construction of three (3) viewing/sitting platforms located adjacent to an access trail overlooking the pond and associated marsh area. The placement of two (2) habitat havens (pole platform nesting structures) will be located in the middle of an increased pond area and the planting of berry-producing vegetation will provide additional screening between the pond, trail and viewing sites. The placement of three (3) interpretive signs along the trail, adjacent to the platforms identifying the existing flora and fauna, and expressing wildlife viewing tips and etiquette will increase public awareness, appreciation, and enjoyment of the urban wildlife habitat. The grant application requests funding to develop the interpretive component of the project while the City's match funds will develop the increased pond area (existing dam modifications) and the trail aspects of the project.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** U. S. Department of Energy  
Western Area Power Admin.

**Project #** U97012

**Dollars Awarded:** \$33,651.00

**Project Title:** Raptor Electrocutation Workshop

**Project Contact:** John Holt  
Env. Manager  
615 South 43rd Avenue  
Phoenix, AZ 85009  
602 352-2592

Develop a phased multi sponsored electrocutation prevention program which focuses on protecting urban raptor resources and risks and liability for utility companies. The first phase of this program which will be implemented in 1997 is an urban raptor electrocutation and risk management workshop. This workshop is designed to bring utility companies, resource management agencies and stakeholders together to discuss how to most effectively reduce urban raptor mortalities and reduce utility company cost and liability.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** City of Mesa  
Parks, Recreation and Cultural

**Project #** U97013

**Dollars Awarded:** \$15,000.00

**Project Title:** Red Mountain Park Environmental Kiosk

**Project Contact:** Bob White  
Parks & Rec. Administrator  
125 North Hobson St.  
Mesa, AZ 85203  
602 644--219

To construct and install an environmental kiosk at Red Mountain Park in Mesa. This kiosk will enhance and interpret the wildlife habitat zone within Red Mountain Park to benefit native species. The kiosk will help educate students from neighboring schools and other park patrons, which will foster appreciation and wise stewardship of wildlife resources. The kiosk is phase one of a long-term plan to develop teaching, research, and interpretive amenities at the park. Regular information updates for the kiosk and future phases will be accomplished in partnership with classes at Red Mountain High School and various state agencies.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
School of Renewable Nat'l Res.

**Project #** U97014

**Dollars Awarded:** \$14,152.00

**Project Title:** Attracting Desert Birds: A Practical Approach

**Project Contact:** Bill Mannon  
Professor  
325 Biological Sciences East  
Tucson, AZ 85721  
520 621-7283

A collaborative effort with Tucson Audubon Society working in partnership with the School of Renewable Natural Resources, University of Arizona and over forty commercial, nonprofit, academic, federal, and state agencies in Tucson and Phoenix to accomplish this project to develop, produce, and distribute a concisely written, scientifically-based, and regionally appropriate brochure which will help the public make informed decisions about whether to feed birds, what to feed them, when and how to feed responsibly.

1997 HERITAGE GRANT AWARDS

Heritage - Urban Wildlife and Urban Wildlife Habitat

**Applicant:** University of Arizona, Board of Regents  
Sponsored Projects Services

**Project #** U97015

**Dollars Awarded:** \$45,457.00

**Project Title:** Rattlesnakes and Urban Development: A Management Plan

**Project Contact:** Matthew Goode  
Principal Investigator  
Sun Bldg  
Tucson, AZ 85721  
520 626-6230

The goal of this study is to develop a comprehensive, spacially-explicit management plan for the tiger rattlesnake (*Crotalus tigris*) in urban and suburban areas. In southern Arizona, this species largely occurs in foothill areas that also are prime locations for residential development. Using radiotelemetry, mark-recapture, diet and habitat analyses and other methods, we will examine interactions between rattlesnakes, rodents, and humans in natural areas compared to areas of medium-and low-density housing. Our ultimate goal is to gain information on the ecology of this species that will provide land managers with specific methods useful in promoting coexistence of humans and rattlesnakes in urban areas.