

Wildlife 2006

The Arizona Game and Fish Department's
Wildlife Management Program Strategic Plan
for the Years 2001-2006



Arizona Game and Fish Department
2221 West Greenway Road
Phoenix, Arizona 85023-4399

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Preface

The Arizona Game and Fish Commission (Commission) and Department (Department) serve the people of Arizona as steward of the State's wildlife. These resources are a public trust, managed for the benefit of present and future generations. Therefore, the needs and concerns of Arizona's citizens form the foundation of *Wildlife 2006*. To establish that foundation, we must measure and consider the attitudes and opinions of the public. Conversely, the public must understand both the short-term and long-term nature of our mission (see page 1), and the conflicts inherent to managing wildlife resources for a public that is not usually of a single mind.

The Commission and Department are responsible for conserving, enhancing, and restoring Arizona's wildlife resources and habitats through protection and management programs, and providing wildlife resources for the enjoyment, appreciation, and use of people. *Wildlife 2006* describes the strategies through which we intend to carry out the wildlife portion of this mission from 2001 through 2006.

Wildlife management is influenced by many factors. Some are beyond the Commission's or the Department's control, including climatic fluctuations, changes in human demographics, and public preferences. Due to the often unexpected and unpredictable nature of these factors, we recognize that even the best plan is subject to change.

Wildlife 2006 is no exception. Changes to *Wildlife 2006* may be requested by the Commission, by the Department, or by members of the public throughout the six-year life of the plan. This Strategic Plan was developed with input from the public. Any proposed changes will also be presented to the public for further comment.

For copies of this plan, or to provide comment on it, please see the instructions on page 91.

We appreciate your interest in wildlife conservation and look forward to hearing from you.

Wildlife 2006 Planning Team
Arizona Game and Fish Department

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Wildlife 2006

The Arizona Game and Fish Department's Wildlife Management Program Strategic Plan for the Years 2001-2006

Introduction

This Strategic Plan, *Wildlife 2006*, reflects the preferences of Arizona's citizens as they relate to management of Arizona's wildlife and wildlife-oriented recreation. It also reflects the biological principles involved in managing Arizona's wildlife.

Wildlife 2006 identifies what the Arizona Game and Fish Commission and Department expect over the next six years from our Wildlife Management Program. It includes specific strategies and objectives for each of the program's three subprograms: 1) Game Management, 2) Sportfish Management, and 3) Nongame and Endangered Wildlife Management. These strategies and objectives identify what we hope to accomplish, and provide guidelines for how we will manage wildlife. In short, they define what we expect from ourselves and our cooperators, and what the public can expect from us. This plan's strategies and objectives will be the driving forces behind the annual work plans (operational plans) that will guide our daily activities.

Wildlife 2006 is a living link between the past and the future. The Department has a long tradition of providing recreational opportunities for the hunting and angling public. We also have a rich and successful history in wildlife conservation. As we strive to maintain and enhance programs for traditional stakeholders, we must also embrace relatively new and emerging interests such as wildlife watching, wildlife photography, and other less traditional recreational activities. *Wildlife 2006* will be especially crucial to ensuring that a mutually beneficial and enjoyable blend of the old and the new is achieved.

The Department Mission

The Department's mission is to conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Wildlife Management Program Goals

The Commission and Department have management authority for the wildlife of the State, but share stewardship responsibility for wildlife habitat with many partners. The Wildlife Management Program emphasizes partnerships with land and water management agencies, property owners, lessees, and all levels of government to promote cooperative habitat management that leads to mutual benefits for all wildlife recreationists and for Arizonans whose culture and livelihood depend on productive use and care of grassland and forest ecosystems.

The goals of our Wildlife Management Program are to: provide fish and wildlife benefits and compatible public uses through diverse and cooperative wildlife management, while avoiding adverse impacts to habitat; protect wildlife populations, habitats, and public health and safety; and increase public awareness and understanding of wildlife resources and the Department.

Commission and Department Authorities

Arizona Revised Statutes (A.R.S.) Title 17 directs the responsibility for maintenance and management of the State's wildlife resources to the Commission and Department.

A.R.S. 17-102:

- Most wildlife in Arizona is the property of the State.

A.R.S. 17-231: Through the Commission, the Department may:

- Establish policies and programs for the management, preservation, and harvest of wildlife.
- Establish hunting, trapping, and fishing rules and prescribe the manner and methods which may be used in taking wildlife.
- Enforce laws for the protection of wildlife.
- Develop and distribute information about wildlife and activities of the Department.

The Department's Wildlife Management Program, the focal point of *Wildlife 2006*, establishes policies and projects for management, conservation, and recreational use of wildlife. It also establishes rules for hunting, fishing, and trapping; prescribes methods that may be used in taking wildlife; and establishes services necessary to carry out the provisions of A.R.S. Title 17. This program is responsible for enforcing laws to protect wildlife and wildlife resources, resolving access issues for wildlife-oriented recreation and resource protection, and disseminating information about wildlife, wildlife-related issues, and Department activities.

A Commitment to Partnerships

The Commission and Department are committed to doing the public's business in public, with participation by the public. Conservation and management of Arizona's fish and wildlife resources, both of which are public trust responsibilities, clearly are the public's business. Thus, this Strategic Plan is based on a simple philosophical commitment: the Department will carry out the Strategies by which we will meet the Challenges described herein, and accomplish our wildlife goals, through partnerships.

What does "partnership" mean to us? It means that we will strive to identify, and reach out to, those who are and those who might be interested in or affected by the issue at hand. It means that we will work with those partners to find common ground that ensures wildlife needs are addressed in collaborative (cooperative) fashion, with an eye on the future as well as the present and past. It means that we will work within the letter of the law, and the spirit of the law, using

the best science available, but temper our actions and decisions with the knowledge that we, and wildlife, share this landscape with many other species, and many other people.

Perhaps above all, a commitment to partnerships means that we expect problems to emerge, conflicts to surface, and disagreements to arise. However, we believe that through logic, reason, face-to-face interaction, and factual information, we will find ways to resolve them. We understand that wildlife conservation and recreation are but two “uses” of an intensively committed landscape, and we will strive to find their rightful place in full recognition of the “multiple use” ethic that drives public lands management in this democratic republic.

In other words, a commitment to partnerships means that we will try our best to find “win-win” solutions to problems, and we will be respectful, forthright, and honest. It means that if we do fail to find common ground, it will not be for lack of effort on our part.

To recognize this commitment to partnerships, throughout this document we will strive to use “partners” and partnerships without modifiers, without specifying which interest groups might be among the partners or partnerships in a given situation. Similarly, we will strive to use other terms without limiting them. For example, we may use “recreationists,” without specifying whether they are consumptive or nonconsumptive, hunters or birdwatchers, hikers or anglers. We will use the inclusive “government” or “all levels of government,” rather than specifying each time that we mean federal, state, local, tribal, and sometimes even foreign governments. Where more specificity is required, we will use more specific terms. However, that will not change our commitment to being inclusive, to building partnerships, to working with partners.

With whom will we partner? The list is almost infinite: archers, anglers, bait-bucket anglers, birders, birdwatchers, boaters, businesses of any kind, cane pole and tournament anglers, concessionaires, conservationists, environmentalists, farmers, flyfishers, governments of any kind, guides and outfitters, hikers, hunters, industry of any kind, miners, nature photographers, off-road vehicle users, organizations of any kind, primitive weapons hunters, ranchers, students, teachers, tourism interests, trappers, “varmint” callers, wildlife watchers. In short, anyone. We are fully committed to considering and exploring every conceivable opportunity to work constructively with anyone, when wildlife interests will be well served.

This commitment to partnerships is long-standing, but, like anyone else, we can always “talk the talk” and “walk the walk” even better. And so we will.

The Arizona Game and Fish Department is the only State agency with the legal mandate to manage all Arizona wildlife, but it is only one of many agencies involved in natural resource management. Our partnerships with agencies, all levels of government, property owners and leaseholders, and private organizations are intended to ensure that wildlife and wildlife recreationist needs are addressed with other resource needs and land uses.

Much of Arizona's wildlife management takes place through partnerships and planning with other agencies, especially those with responsibility for managing habitat and land uses. The Department reviews, revises, and, as appropriate, renews these commitments in accordance with

the signed agreements with our partners. Examples of commitments and interagency plans that may affect implementation of this Strategic Plan include:

Bureau of Land Management: Habitat Management Plans (Note: these are being phased out in favor of Ecosystem Management Plans)

U.S. Fish and Wildlife Service: Refuge Management Plans and Recovery Plans

U.S. Forest Service: Forest Plans; Land and Resource Management Plans; Arizona Wildlife and Fisheries Comprehensive Plan

Various Entities: Memoranda of Understanding or Cooperative Agreements

Arizona's borders do not confine our partnerships. Conservation of some species can only be accomplished through cooperation with neighboring states and countries. Some of our migratory birds and bats require partnerships with even more distant entities. Longstanding efforts by government and private cooperators to conserve North America's waterfowl are well known, and highly successful. More recently, Canada and several Central and South American countries have joined with Mexico, Arizona, and our neighboring states in efforts to manage songbirds and other "neotropical migrants" that may only winter or breed here in Arizona, or perhaps just stop over briefly during spring or fall migration. Similar national and international conservation efforts are just beginning for amphibians, reptiles, and bats.

A Glossary

While evaluating the public comment on prior drafts of this plan, it occurred to us that some of the language in this document is foreign to our readers, and even some of the common English words were subject to widely disparate interpretations. Thus, we have included a Glossary as an Appendix to this document. Please refer to it when you wonder what a particular word means.

A Focus on Wildlife

Arizona's tremendous wildlife diversity is a reflection of the State's topographic and climatic diversity. It also reflects the State's position at the junction of the four American deserts (Chihuahuan, Great Basin, Mohave, and Sonoran), and at the terminus of the temperate Rocky Mountains and the tropical-subtropical Sierra Madre of Mexico. More than 800 species of fishes, amphibians, birds, reptiles, and mammals occur here year-round, as seasonal residents, or migrants (see Table 1). Most are native, some are not. Some are hunted or fished, most are not. Many of our native animals occur widely elsewhere, others do not. The ecological value of these animals, the attraction they hold for the public, and the factors influencing their populations are the driving forces shaping this plan.

Arizona's wildlife resources are often greatly affected by human activities. Likewise, Arizonans are often greatly affected by wildlife. The impacts can be beneficial or detrimental to wildlife, recreationists, or residents of areas impacted by wildlife. The impact of each human activity often differs from one species of wildlife to another; an activity benefiting one may harm another. Similarly, a species of wildlife may have a positive impact in one area, a negative impact in another. Impacts may also vary with the seasons, or in response to weather. Wildlife management is the art and science of balancing the desires of the public with the biological needs of wildlife to ensure the greatest good for the greatest number of species, while adequately protecting each species for the enjoyment of people.

Fortunately, Arizona has a long legacy of successful wildlife management. *Wildlife 2006* will help guide management responses to future challenges, building on successes of the past, and avoiding mistakes that have been made. Clearly there are many successes on which to build.

Table 1. Species of Arizona wildlife. Non-native species include (a) those that are not native to Arizona but which are native elsewhere on this continent, and (b) true exotics—those that are not native to North America. Note: Arizona's native crustaceans and mollusks are too poorly known for their numbers to be included in this table.		
	Native	Non-native
Fish		
Freshwater	30	50
Saltwater	2	0
Amphibians	26	4
Reptiles	103	4
Birds		
Raptors	42	0
Nonraptors	460	5
Mammals	134	11
Total	797	74

Indeed, the effectiveness of wildlife management efforts to date can best be measured by the species of wildlife still thriving within Arizona's borders and the spectrum of wildlife-based recreational opportunities available. Restoration efforts have been a big part of our wildlife success story, as species such as bighorn sheep, deer, elk, and the peregrine falcon have now recovered from virtual elimination.

To achieve the greatest return for the time and money invested, wildlife management is now largely focused on land uses and habitat. Improving forest and range management, mitigating impacts from mining and urbanization, and ensuring adequate water will be crucial to the success of wildlife management. Cooperation with public and private landowners and recreationists will continue to help ensure that they are involved in developing wildlife management decisions. Also, increased attention will be placed on outreach to the "silent majority," who affect wildlife management through their decisions on local and statewide issues. The Department will strive to ensure, however, that sound wildlife management always prevails.

Although this plan has many management elements that appear to be, and often are, species-specific, the Department is committed to integrating its wildlife program into management of ecosystems and broader landscapes. A basic principle of ecology and ecosystem management is that biological systems composed of more species (increased diversity) are more stable and productive; therefore, they are better able to withstand environmental perturbations. Many species serve as biological barometers of ecosystem health, indicating changes in habitat quality and biological diversity. Ecosystem management cannot be successful without integrated conservation of individual species and of the habitat or biological community as a whole. Understanding species-specific needs, and meeting them, in the context of ecosystem management is essential to optimal management of wildlife resources.

Scoping, Drafting, and Approving the Plan

The planning process for *Wildlife 2006* began with *Wildlife 2000*. Social research surveys, customer assessments, and evaluation of past progress also helped shape *Wildlife 2006*. The Department solicited public input in April and May 2000 on the challenges and strategies listed in *Wildlife 2000*. This input was used to develop the challenges and strategies in *Wildlife 2006*. The first full draft of *Wildlife 2006* was made available for public comment on July 31, 2000. Public meetings were held throughout Arizona in August and September 2000, to gather more public comment. The plan was also discussed at five Arizona Game and Fish Commission meetings (August, September, October, and November 2000 and January 2001). All input on the plan was evaluated, and discussed with the Commission in public session. The plan was modified as appropriate to reflect Commission guidance and direction.

The over-riding goal of this Strategic Plan is to best meet the needs of the biological resource, while remaining in balance with many different, often conflicting, public desires and the Department's limited resources. Not everyone's desires or comments will result in changes to this plan, but everyone's comments were fully considered before the final plan was adopted.

The Commission approved *Wildlife 2006* on January 19, 2001. The U.S. Fish and Wildlife Service Region 2 Office of Federal Aid approved it on March 20, 2001.

General Challenges and Strategies

In pursuit of its mission, the Department will address the following Challenges and Strategies through *Wildlife 2006*. These Challenges are common to all species of wildlife, whether game or nongame, sportfish or native fish, abundant or rare. These Strategies define in general terms how the agency will address the Challenges through annual or biennial operational plans (work plans) within the agency's three wildlife subprograms: game management, sportfish management, and nongame and endangered wildlife management. Thus, the Challenges and the Strategies are also reflected in the three wildlife subprogram sections later in this document. For example, the agency's commitment to diverse partnerships (Challenge 5, with multiple Strategies), serves as an umbrella for a variety of typically more detailed, species-specific and other strategies in the game management, sportfish, and nongame and endangered wildlife subprograms. By not restating the Challenges and Strategies in each section, we have reduced the length of this document appreciably.

Whether and how any given Strategy is implemented will, however, be contingent upon available funding, biological factors, weather, and other constraints, and in some cases will require agreements with governmental and/or nongovernmental cooperators.

Challenge 1. Public Service, Planning, and Funding

The Department must manage Arizona's wildlife resources as a public trust, through activities that are efficient, effective, well-planned, collaborative, and appropriately funded, with ample opportunities for public participation in planning, implementation, and evaluation.

Strategies

- A. Maintain the agency-wide commitment to excellence in the Department's Wildlife Management Program, through: continuous process improvement, data-based decisions, efficiency in operations, delegation of authority, collaborative conflict resolution, common sense, and commitment to public service.
- B. Enhance public awareness of the Department's stewardship responsibility for Arizona's wildlife resources; the agency's goals, objectives, activities, and accomplishments; and wildlife-related issues.
- C. Build partnerships to address wildlife resource issues effectively and efficiently, in a cooperative, coordinated, and proactive manner that strives toward consensus-driven results.
- D. Conduct the Wildlife Management Program, while recognizing that efforts to meet resource needs may sometimes be tempered by societal values or by availability of fiscal resources: through a collaborative, consensus-driven approach to conflict resolution; with respect for property rights and the authorities and responsibilities of other government agencies; and without inappropriately impacting other uses of public lands.

- E. Implement *Wildlife 2006* through a Comprehensive Management System that includes strategy-specific objectives and approaches in operational plans to set priorities for the agency's three wildlife subprograms.
- F. Implement strategies from the Department's *Off-Highway Vehicle Strategic Plan* and *Watercraft Strategic Plan* to meet goals and objectives that are relevant to *Wildlife 2006*.
- G. Maintain a skilled and culturally diverse work force through aggressive recruitment and retention, and provide employees with professional growth and career progression opportunities.
- H. Maintain staffing levels in the three wildlife subprograms that are adequate to ensure effectiveness and efficiency, and periodically evaluate them to identify current and future needs.
- I. Supplement existing staff through the use of volunteers, and provide opportunities for volunteers to enhance their skills and knowledge while they help the Department accomplish its mission.
- J. Supplement existing staff with external expertise through contracts, grants, internships, interagency personnel exchanges, etc.
- K. Provide Department employees and volunteers with the training and resources necessary to implement *Wildlife 2006* successfully.
- L. Periodically evaluate subprogram funding needs by determining base program and enhancement project needs for all work units.
- M. Identify and develop new sources of funding to provide program stability, buffer against inflation, and meet the needs of an expanding human population.
- N. In October 2002, 2004, and 2006, report to the public on each wildlife subprogram's accomplishments relative to the Challenges and Strategies in *Wildlife 2006*, and public satisfaction with subprogram performance.
- O. By December 2006, complete a *Wildlife 2012* Strategic Plan.

Challenge 2. Wildlife Information

The Department must ensure that the biological information on which wildlife conservation and recreation decisions are based is: accurate, current, readily available; used to fully implement the multiple-use concept of managing public lands; and available to use in stewardship of private lands.

Strategies

- A. Evaluate the quality and availability of wildlife information and improve both by increasing the efficiency, effectiveness, and scientific rigor of collection and analysis methods.
- B. Collaboratively develop and implement standardized techniques and protocols for wildlife inventory, survey, population modeling, monitoring, harvest, and for habitat assessment and monitoring.
- C. Develop and maintain manual and computerized management information systems to efficiently and effectively store, retrieve, and analyze data.
- D. Gather information on wildlife distribution, abundance, ecology, and natural history, and conduct research on wildlife issues, including disease, habitat requirements, taxonomy, and responses to management actions and land uses, and relate the findings to current or recommended management strategies.
- E. Cooperate with public and private entities in gathering and using wildlife management information.
- F. Identify trends in wildlife distribution, abundance, and harvest.
- G. Recommend actions to protect and manage wildlife, wildlife habitats, and wildlife-based recreation.
- H. Provide training to enhance staff proficiency in all areas of wildlife information collection, management, application, and dissemination.
- I. Disseminate wildlife information to the public.

Challenge 3. Wildlife Management

The Department must ensure that wildlife management decisions reflect sound science, and full consideration of relevant biological and social values.

Strategies

- A. Develop and implement scientifically-sound wildlife management guidelines for all species of wildlife that need such guidelines, including harvested species and non-harvested species that need intensive management.
- B. In accordance with Department guidelines, when appropriate and economically feasible, enhance or reestablish wildlife populations within historically-occupied range.
- C. Maintain, improve, and restore habitats to help meet wildlife population management objectives that are consistent with wildlife recreation and conservation values.
- D. Solicit voluntary cooperation from property owners and lessees of public lands in striving to accomplish wildlife management objectives.
- E. Proactively consider the effects of wildlife management decisions on other species, public recreation, other land uses, cultural resources, socioeconomic values, and relevant resource-use groups.
- F. Continue moving from single-species planning toward ecosystem-based planning, in cooperation with external partners.
- G. Prohibit introduction of non-native species of wildlife, unless consistent with other wildlife management objectives.
- H. Develop and implement programs to minimize resource conflicts, such as wildlife-livestock competition, depredation, disease transmittal, and the impacts of non-native wildlife and feral animals.
- I. Integrate urban wildlife activities into the three wildlife subprograms and develop them to better meet human and resource needs.
- J. Promote public awareness of wildlife management issues.

Challenge 4. Wildlife Habitat

The Department must strive to work collaboratively to ensure that habitat is protected and managed to meet wildlife objectives.

Strategies

- A. Develop and implement effective protocols to determine and monitor the quality and value of wildlife habitat.
- B. Maintain and promote wildlife habitat conservation, habitat enhancement, and land protection programs for urban areas and rural areas. On non-Department lands, achieve wildlife objectives by providing information and guidance to land management agencies and other vested interests (e.g. lessees, concessionaires), and through voluntary stewardship agreements and conservation easements with property owners. When other land protection mechanisms have proven infeasible or inappropriate, the Department may purchase properties.

Note: by Commission policy, the Department purchases property only from willing sellers. The Department pays in-lieu taxes for such acquisitions.

- C. Advocate for, and where possible secure, instream flows and impoundment minimum-storage levels sufficient to sustain viable populations of aquatic, riparian, and wetland-dependent wildlife.
- D. Advocate for, and where possible participate in, watershed restoration to improve wildlife habitat.
- E. Monitor and evaluate the impacts of public lands uses on wildlife habitat, and the impacts of wildlife on habitat.
- F. Provide technical guidance and information to parties undertaking land and water development projects on public lands that might affect wildlife resources, to help them avoid impacts to wildlife and habitat. Where negative impacts to wildlife and habitat cannot be avoided, work with the project sponsors and permitting agencies to develop plans to mitigate, or where necessary compensate, for wildlife and habitat losses.
- G. Promote habitat improvements to resolve or reduce resource use and user conflicts.
- H. Evaluate, maintain, restore, enhance, and protect wildlife habitat on all Department-owned or managed properties.
- I. Develop and implement processes to adopt and refine management plans for all Department-owned and managed properties.
- J. Maintain Department wildlife-related facilities in proper operating condition.

- K. Increase public awareness of habitat issues, and provide information and expertise to communities, regional development interests, and the public regarding the impact of expanding human populations in Arizona on wildlife habitat and the needs of wildlife on both small (local) and large (landscape) scales.
- L. Solicit voluntary cooperation from property owners and lessees of public lands in striving to accomplish wildlife habitat objectives.
- M. Strive to develop incentive-based opportunities for private partners to engage in wildlife habitat conservation projects.

Challenge 5. Partnerships

The Department must meet Arizona's wildlife needs through inclusive partnerships that recognize wildlife as a public trust, and the Department as trust steward.

Strategies

- A. Collaboratively address wildlife-related issues and meet public needs for wildlife protection, management, and recreation.
- B. Develop agreements with local governments for cooperative management of urban and rural lands and waters, and those in annexed areas, that are important to wildlife and to wildlife-based recreation, including hunting and fishing.
- C. Cooperate with other states, tribes, and other countries to develop and implement conservation strategies that help ensure restoration and long-term viability of wildlife native to Arizona.
- D. Cooperate with the public, other agencies, property owners, and lessees to promote public and agency awareness of access and trespass issues relative to wildlife recreation and management activities.
- E. Promote methods to minimize wildlife conflicts on agricultural and other private properties, and to enhance public awareness of property rights as they relate to wildlife conservation and wildlife-related recreation.

Challenge 6. Laws and Legal Considerations

State and federal laws, regulations, and policies must be sufficient to protect and conserve wildlife and wildlife habitat, and sustain and enhance ample public recreation opportunities.

Strategies

- A. Maintain a liaison with the Legislature to review potential and pending legislation, and to maximize opportunities to cooperate with others in identifying and working toward mutually agreeable goals and objectives.
- B. Work with all levels of government, enforcement agencies, constituent groups, and the public to develop and increase awareness of laws, rules, and policies that protect wildlife and wildlife habitat, and which enhance wildlife recreation opportunities.
- C. Cooperate with entities developing non-wildlife oriented regulations, such as zoning ordinances, to maximize compatibility with wildlife management and wildlife recreation objectives.
- D. Evaluate existing wildlife and wildlife-related laws, regulations, and policies to determine whether they are still needed, are effective, or need to be changed.
- E. Identify areas of the State where laws, regulations, or policies established by other entities impede wildlife habitat maintenance or improvement, and develop and implement strategies to achieve the desired objectives.
- F. Coordinate with the State Attorney General's Office to minimize the basis for litigation against the Department and Commission, or to enforce their statutory authority when necessary.
- G. When laws, regulations, and/or policies are deemed by the Commission to be insufficient, evaluate and recommend alternative remedies, including fostering legislative reform, arbitration, mediation, and/or litigation.

Challenge 7. Law Enforcement

The Department must enforce wildlife-related laws and regulations to protect wildlife and wildlife habitat, protect public health and safety, and sustain ample recreation opportunities.

Strategies

- A. Use law enforcement patrols, officer visibility, officer contact, and information and education programs to enhance public awareness and knowledge of wildlife-related laws and regulations as a means of improving voluntary compliance.
- B. Develop and implement enforcement strategies and techniques, including use of patrols and volunteers, to increase deterrence, detection, and apprehension of violators, improve compliance rates, and enhance constituent involvement and public awareness.
- C. Cooperate with enforcement and land or resource management agencies in Arizona, other states, and other countries to implement and enforce wildlife-related laws, regulations, and policies.
- D. Provide training to Department employees, volunteers, and cooperating law enforcement agencies regarding wildlife-related laws, regulations, and policies.
- E. Maintain an enforcement records database, and provide employee training in its use, to help carry out the Department's mission.
- F. Evaluate wildlife-recreationist related vandalism and trespass on public and private lands, and implement information, education, and enforcement measures to address problems.
- G. Evaluate the effectiveness of wildlife-related laws, regulations, policies, and law enforcement efforts.

Challenge 8. Wildlife Recreation

The Department must provide ample public recreation opportunities for the full spectrum of wildlife-related recreationists, consistent with wildlife conservation values.

Strategies

- A. Conduct surveys of public participation in wildlife-related recreation, and quantify rates and economic values for active and passive participation.
- B. Enhance opportunities for the public to enjoy wildlife, and promote responsible wildlife-based recreation.
- C. Encourage participation by youths, females, and other under-represented groups in hunting, fishing, other wildlife recreation programs, and shooting sports.
- D. Plan for appropriate interactions between hunters, anglers, trappers, and other wildlife users or enthusiasts when developing wildlife management programs.
- E. Identify lands and waters that are closed to public access, or that do not have sufficient access, and work with interested parties to meet wildlife management, recreation, and other access needs, without causing unacceptable impacts to wildlife or habitat and without infringing on property rights.
- F. Enact or promote closures on public lands as necessary to protect wildlife values, while providing compatible recreation opportunities.
- G. Work with all levels of government and other partners to minimize conflicts among recreationists.
- H. Increase public awareness of access needs, the public's rights to access, access etiquette, and the rights of property owners to restrict access to their lands.
- I. Strive to maintain and enhance access to wildlife recreation sites by promptly addressing concerns of private individuals who provide public access to or through the lands they own or lease.

Challenge 9. Public Information and Education

The Department must reach out to the public to communicate accurate, timely information that promotes public awareness, understanding, and enjoyment of wildlife, wildlife issues, and wildlife-related recreation opportunities, and to obtain information about public attitudes and public preferences regarding the wildlife resource and related conservation, education, and recreation issues.

Strategies

- A. Meet the needs of the diverse public by enhancing the Department's commitment to information and education as a management strategy.
- B. Increase public awareness, appreciation, and understanding of Arizona's wildlife as a public trust, and the Department's role as steward of that public trust.
- C. Increase public support for the Department's mission and programs, and to increase and stabilize revenue bases.
- D. Increase the abilities of Department employees and volunteers to communicate effectively with the public.
- E. Monitor public attitudes on wildlife protection, management, and recreation opportunities and issues.
- F. Evaluate the effectiveness of programs in transferring agency values, information, education, and skills to the public.

Game Management Subprogram

In America's past, hunting was a widespread recreational pursuit, and sometimes a necessity. Today, hunting provides a unique link to our past. As our society becomes increasingly urban, outdoor recreation patterns are changing. During the last quarter of a century, even though the total number of hunters has increased, the percentage of the population that hunts has decreased. An understanding of demographics and preferences of Arizona hunters is crucial to establishing hunt objectives and guidelines. Equally crucial is offering diverse opportunities to all Arizona residents to experience and appreciate Arizona's hunting heritage.

The Arizona Hunter

To collect information necessary for this Strategic Plan, the Department mailed surveys in July 2000 to a randomly selected sample of 2000 purchasers of 1999 hunting licenses (211 surveys were returned as "undeliverable"). At the time of response summarization for this document, 702 (39.2%) surveys had been received. Most of the data from this survey are labeled "2000." Some questions, however, were designed to collect information on hunter activities during the previous year, and the results are labeled "1999." Similar to 1993, age, sex, and state residency were derived from a sample of 1999 hunting license receipts. Unless indicated otherwise, data are from residents and non-residents combined.

In addition to the information necessary for the Strategic Plan, the survey was designed to collect data that could be used for trend comparison with data collected during similar surveys in 1987 and 1994. All surveys included residents and non-residents in proportion to their occurrence in the hunting population. Arizona population statistics were taken from the Arizona Department of Economic Security's Internet website (<http://www.de.state.az/>).

Sales of Arizona hunting licenses reached a high in 1986. The Department provided limited opportunity to harvest two deer during this period. After 1986, hunting license sales declined until a low was reached in 1992. Several factors may have contributed to this decline: poor deer and quail hunting, application deadline for the draw shortened by a week, archery javelina was added to the draw, and an increase in the cost of hunting licenses in 1990. From 1992 to 1993, hunting license sales jumped 12.4 percent (Fig. 1). Small game hunters appear to be responsible for much of this increase, as their numbers increased approximately 11,300 (13.6%), based on the annual small game hunter questionnaire. The number of applications submitted in drawings increased by 5.7 percent in 1993, indicating that the number of hunters who bought licenses to hunt big game probably increased as well. Arizona hunting license sales continued to increase to the present, with a slight drop in 1996 and 1997. This drop may have been a customer response to poor hunting conditions for all species, especially deer, quail, and dove. In 1998, deer were added to the bonus point system, allowing unsuccessful deer applicants in 1999 to begin accumulating points. This may have reversed the drop in hunting license sales that occurred in 1996 and 1997.

The percentage of Arizona residents who purchased hunting licenses has decreased since 1993, with only 3.4 percent of Arizonans purchasing a hunting license in 1999 (Fig. 2). This decrease is a reflection of Arizona's population increasing, while the number of resident hunters remained stable.

The proportion of non-resident to resident hunting license purchasers was 12.2 percent in 1999, an increase from 9.9 percent in 1993 and the 10.0 percent reported in 1990 (Fig. 3).

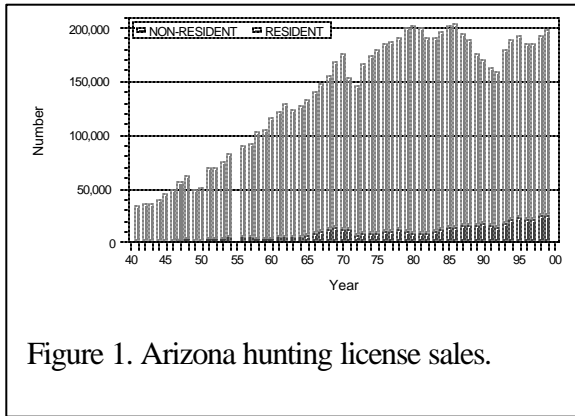


Figure 1. Arizona hunting license sales.

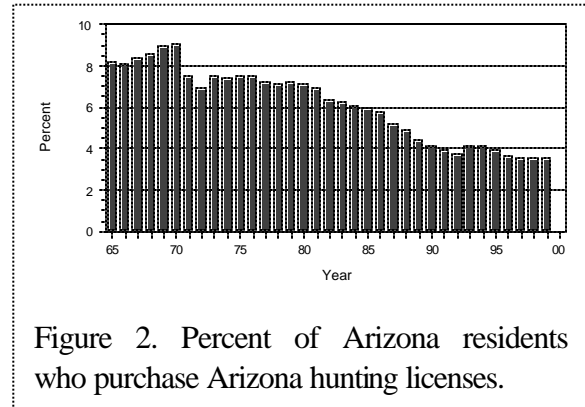


Figure 2. Percent of Arizona residents who purchase Arizona hunting licenses.

Women continue to comprise only a small proportion of hunters, 6.4 percent in 2000 versus 6.1 percent in 1994 and 6.9 percent in 1987. Ages reported on samples of licenses continued to increase during 1987-2000. Mean ages shifted upward from 36.8 in 1987 and 37.8 in 1993 to 44.7 in 1999. This shift is evident on comparison of age-class composition (Fig. 4). The "population pyramid" continues to become more top-heavy, indicating declining recruitment of young hunters. This is corroborated by the fact that fewer hunters in recent years indicated harvest of small game by junior hunters on their annual small game questionnaires.

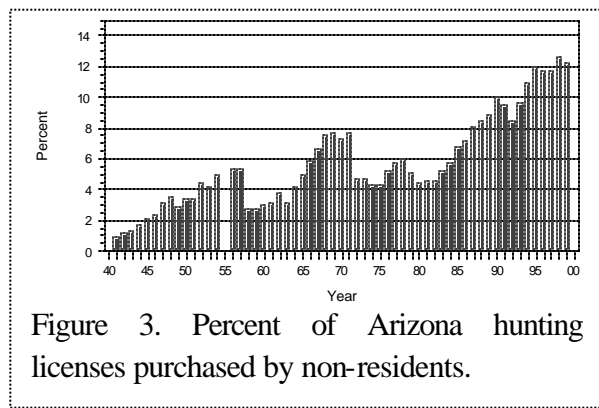


Figure 3. Percent of Arizona hunting licenses purchased by non-residents.

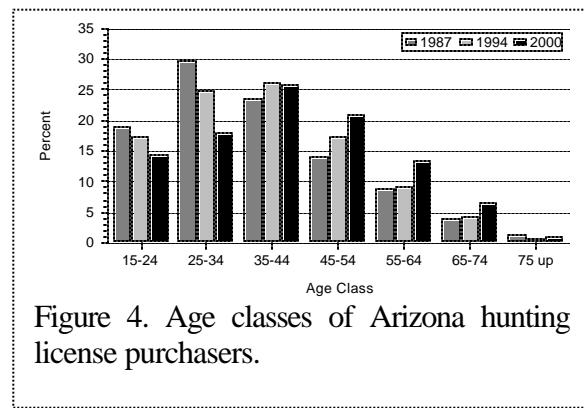


Figure 4. Age classes of Arizona hunting license purchasers.

Years of residency for Arizona resident hunters shifted back to the middle age classes during 1994 to 2000. Education level of Arizona hunters appears to have remained stable from 1987 to 2000 with 59.4 percent of respondents completing trade school or some level of college.

The population size of communities in which hunters reside shifted slightly toward communities of less than 100,000 in 2000. Membership in hunting and conservation organizations remained relatively stable during 1987-2000. Subscription rates to the Department's *Arizona Wildlife Views* magazine more than doubled from 12.3 percent in 1987 to 27.5 percent in 1994 but dropped to 17.1 percent in 1999. The percentage that subscribed to the Department's Newsletter continued to decline from 5.0 percent in 1987 and 4.0 percent in 1994 to 3.1 percent in 1999. The percentage of hunters who had completed the Arizona Hunter Education course increased from 32.8 percent to 34.2

percent during 1994-2000. Adding deer to the bonus point system, which awards a permanent bonus point to hunters who complete the Arizona Hunter Safety course, was probably a factor in this increase. The rate of completion of other states' hunter education courses continued to increase (16.7% in 1987, 20.5% in 1994 to 27.1% in 2000). In 2000, 61.3 percent of Arizona hunters had completed a hunter education course, an increase of 8.0 percent from 1994.

The percentage of hunters who contributed to the Nongame Wildlife Checkoff on their Arizona State Tax Form continued to decline from 31.8 in 1987, to 30.1 in 1994, to 20.1 in 1999.

Survey responses indicated a slight decrease in participation in most outdoor activities from 1994 to 2000.

When asked why they purchased their licenses, respondents in 2000 indicated they preferred to hunt big game and small game equally.

The percentage of hunters who purchased tags for archery deer, archery turkey, bear, and lion increased from 1993 to 1999 (permit-tags became required for fall turkey and archery javelina hunts in 1991 and 1992, respectively). Fee increases in 1989 for bear and lion tags were probably largely responsible for the decline from 1987 to 1993 sales for these tags.

The percentage of hunters who applied in hunt draws decreased for deer and javelina while increasing or remaining the same for all other species during 1987-1999. Of those who purchased a 1999 hunting license, 80.8 percent responded that they hunted during that year. These hunters were asked how satisfied they were with their hunting experience in Arizona. Of the 1999 hunting license purchasers, 66.7 percent scored their experience as a seven or greater, with 10 indicating extremely satisfied. The majority of hunting licenses holders who actually hunted in 1999 and scored their experience as a five or less, gave "unsuccessful hunt/didn't bag any game" and "not enough animals" as the main reasons for the lower score.

There was no consistent pattern in the percentages of hunters who reported that they usually hunt various small game and migratory bird species. Interestingly, hunters must interpret "usually" to mean hunting at least once every several years, because rates of hunt participation for various species were greater from this survey than from the small game hunter questionnaires. For example, there were only 309 sandhill crane permits issued in 1999. When the 1.4 percent of respondents who said they usually hunt sandhill crane is expanded to the number of 1999 small game hunters (97,122), there are 1360 hunters "usually" hunting sandhill crane.

Weapon ownership increased slightly in almost all categories, with the ownership of archery tackle almost doubling, during 1987-2000. Previous questionnaires indicate rates of ownership of most types of weapons are higher for big game hunters than for hunters in general.

The person who introduced respondents to hunting remained relatively the same from 1987 to 2000. Those who introduce others to hunting are almost entirely male. Only two of 689 (0.2%) hunters with valid responses indicated that a female introduced them to hunting.

The majority of respondents were introduced to hunting by age 14 for all three survey periods. On average, expectations for hunt success during 1987-1994 remained the same, with most respondents indicating two hunters out of a camp of four should be successful. Since actual hunt success, in general, is less than 50 percent and to avoid inflating hunter expectations, the question was modified in 2000. On average, expectations for hunt success in 2000 were 31.2 percent and 37.1 percent, depending on the species. Actual hunt success changed little during this time; actual hunt success was less than expected for deer and spring turkey, as expected for javelina, and exceeded expectations for antelope and elk.

The percentage of hunters who felt that the density of roads in their hunt area was too high increased slightly from 1994 to 2000. Of these hunters, the majority in all three years felt that roads should be closed to protect habitat and reduce hunter densities. Though a majority of hunters felt that access problems in their hunting area had remained the same, a third indicated they had been increasing. When asked where access problems were the most serious, the highest percentages of respondents in 2000 said the southeast and central parts of the state. These percentages dropped from 1994.

During 1987-2000, survey responses indicated that the number of times during the last year that a Department employee had been encountered in the field remained approximately the same. In 2000, 16.7 percent of respondents indicated that they contacted a Department office before hunting; this was an increase from 12.2 percent in 1994.

When given a choice of two methods of restricting archery hunts, respondents to all three surveys had a much higher preference for limiting hunters than for shortening seasons. When asked about restrictions on other hunt methods, hunters seemed to be more opinionated in 1994 than in 1987 or 2000, as indicated by the lower rate of non-response in 1994. The greatest preferences for restriction or elimination in 2000 were shown for the use of ATVs and snowmobiles. Respondents were more lenient in their interpretation of which weapon types should be classified as primitive weapons.

Similar to 1987 and 1994, survey respondents in 2000 were more likely to choose rifle as their weapon of preference. However, an increased preference for archery came at the expense of rifle, with preferences for other weapons remaining stable. Rates of first choice hunt application appear to approximate hunter preferences.

Though less than ten percent of respondents or members of their family would qualify and apply for a disabled hunter permit in 2000, 55.6 percent would agree to opening big game seasons two days earlier for big game hunters with disabled permits. The majority of hunters in 2000 favored having special big game hunts only for juniors aged 10-14 and disabled hunters. Respondents favored having special big game hunts only for juniors aged 10-14 at 61.7 percent with only 41.7 percent favoring the special hunts for juniors aged 10-17.

Beginning with this survey, specific questions were asked regarding the Department's Juniors-Only Hunter Program. Sixty percent of respondents were in favor of allocating a percentage of big game permits to juniors-only hunts. The average allocation given was 9.1 percent.

The Department currently offers juniors-only big game hunts for deer, antelope, elk, turkey, and javelina. In 2000, the Commission allocated 2 percent of all deer permits, 2.5 percent of general

and muzzleloader antelope permits, and 5 percent of antlerless elk permits to juniors-only. Of the respondents in favor of allocating a percentage of big game permits to juniors-only hunts, 52.5 percent indicated the allocation was just right, with another 43.4 percent indicating it was too low. The majority of respondents in favor of allocating permits to juniors-only hunts were in favor of providing the opportunity for all species except bighorn sheep.

When asked if juniors-only hunts should occur at the same time as a general hunt, or at separate times (where, at the same time provides the junior with an increased opportunity to be drawn and at separate times provides special privileges for juniors such as fewer people in the field), respondents favored offering the juniors-only hunts at a separate time (62.7%).

Summary and Conclusions

Reversing a steady decline from 1987 to 1992, sales of hunting licenses have increased each year with a slight drop in 1996 and 1997 (Fig. 1). Probable causes for this increase were improved prospects for small game hunting and the bonus point system for some big game species. The long-term outlook for hunting license sales does not look encouraging. The average age of hunters continues to increase, while the number of young hunters continues to decline despite special efforts to recruit them. Special license (youth combination), special hunts (juniors-only big game hunts and juniors-only afternoon dove hunts), and special hunter education programs have not increased the percentage of young hunters as hoped. In fact, without these programs the percentage might have been much lower.

In most respects, characteristics and opinions of hunters in 2000 were similar to those of hunters in 1987 and 1994. They remain heavily male and middle-aged with average or slightly higher levels of education.

Since the first survey in 1987, Arizona hunters have aged slightly and increased their length of Arizona residency. A larger percentage has completed the Arizona Hunter Education course and subscribes to *Arizona Wildlife Views* magazine. Participation in camping, hiking, and birdwatching seems to have increased. With the bonus point system in place, hunters are apparently applying in the draw more faithfully. Rates of weapon ownership have increased slightly, and use of archery equipment for hunting has almost doubled. Expectations for hunt success range between 30 percent and 40 percent for big game species. Present day hunters seem to favor various potential hunt restrictions less except for restrictions on the use of ATVs and snowmobiles, and are broader in their interpretation of what a primitive weapon is. Though few hunters would qualify as disabled, most hunters would agree to an earlier opening of big game hunts for disabled hunters.

Mission, Goals, and Objectives

Mission: Protect and manage game wildlife populations and their habitats to maintain the natural diversity of Arizona, and to provide game wildlife oriented recreation opportunities for present and future generations.

Goals:

1. Maintain, enhance, and restore (when appropriate and economically feasible) populations of game wildlife to provide for recreation opportunities, including wildlife viewing.
2. Minimize adverse impacts to wildlife and wildlife resources, and strive to resolve human/wildlife conflicts.
3. Increase public awareness of Arizona's game wildlife, its management, and hunting and viewing opportunities.

Objectives:

1. Provide hunting recreation for 190,000 or more hunters annually (190,000 combination licenses and hunting licenses were sold to Arizona resident, junior, and non-resident hunters in 1998, the most recent year for which records are complete).
2. Achieve a 60 percent satisfaction rating among Arizona's hunting public (i.e. 60% of Arizona's hunters indicating they were satisfied with their hunting experience over the past year).
3. Provide Arizona's diverse publics with information and education about game animals and hunting.

Notes: The general *Challenges* and *Strategies* listed earlier in this plan are also addressed for game species in other documents, such as W-53-M (Game Management) Federal Aid Narratives, Annual Work Plans, Game Species Management Guidelines, and Arizona Hunt Management Guidelines.

Each species account in the Game Management Section includes a paragraph on "status," followed by a species-specific or group-specific "goal" and several "strategies." The *Strategies* are often reiterations of the *Challenges* or *Strategies* addressed in the earlier section of this plan. Here they are tailored to these species.

The status descriptions in these game species accounts have been updated for *Wildlife 2006*. Minor revisions have also been made to the species-specific goals, objectives, and strategies. Reviewers should compare the status descriptions against the goals, objectives, and strategies for a given species to recommend any changes they believe are appropriate.

Game Surveys

The Department is required by statute to establish programs for the management of game species for both hunters and non-hunters. The demand for Arizona's game resources generally exceeds the supply. Careful regulation of take is imperative, particularly with respect to ungulates. Regulation of the annual harvest requires an inventory of the game resource and an estimate of the harvest of each species. These data constitute basic information needed to formulate hunting harvest limits and season lengths. This information is also published to provide hunters and non-hunters with a reasonable chance of success in either hunting or observing game commensurate with the available supply and biological welfare of the particular species. This information is also needed by wildlife managers and land administrators to make decisions to regulate the size of the wildlife resource in balance with available habitat, and to make decisions that affect management of forests and rangelands for multiple users.

The Department conducts routine annual and semi-annual surveys for different species of wildlife using a variety of survey techniques (including, where feasible to do so, aerial line, transect, and block surveys). These surveys are conducted to document occurrence and estimate numbers of particular species of wildlife, relative ratios of animals based on sex and age, and recruitment success for a given Game Management Unit.

The Department frequently uses helicopters and fixed-wing aircraft to survey deer, pronghorn, elk, bighorn sheep, javelina, buffalo, and waterfowl on a statewide basis. Where feasible, aerial line transect and block surveys are used to estimate populations. Surveys conducted from fixed-wing aircraft are flown at approximately 70 miles-per-hour, and at least 200 feet above ground level, while observers in the aircraft record the number, age, and sex of the animals surveyed. Surveys conducted from helicopters are flown at approximately 40 miles-per-hour, at a minimum of 200 feet above ground level. Low-level operations are conducted only on the portions of flights occurring over habitat in which the species being surveyed is likely to occur. These habitats include most vegetation associations occurring in Arizona.

Estimating Game Population Numbers

The Department estimates statewide populations of deer, elk, and pronghorn using models that are based on simple life-table calculations. These models determine the population size necessary for estimated annual removal of animals (harvest and non-hunt mortality) over a series of years to produce observed effects on male:female ratios. The principle is that hunts for male animals reduce male:female ratios below those found in non-hunted populations, and the extent of this reduction is dependent upon the size of the harvest and of the population size. Information required for this model is (1) surveyed male:female and juvenile:female ratios for each year in the simulation, (2) harvest estimates for each year, (3) estimates of average annual non-hunt mortality rates for adult males, adult females, and juveniles, and (4) an initial estimate of the number of adult males and females in the population at the time of the first survey.

For elk and pronghorn, the model calculations are as follows (the sequence is slightly different for deer because they are surveyed after the hunting seasons):

1. The pre-hunt population estimate of the first year is divided into adult males, adult females, and juveniles based on the survey ratios collected at that time.
2. Hunter-related mortality is deducted, producing a post-hunt population estimate.
3. Non-hunt mortality for the entire year is estimated for each of the three population segments and subtracted.
4. Juveniles (now yearlings) are added into the adult population on a 50 male:50 female basis. The resulting numbers are the next year's pre-hunt population estimate.
5. Calculations begin again at Step 1 for the next year, using the population estimates from Step 4.

This process is repeated for each year in the simulation. Each time that Step 1 is completed, the male:female ratio calculated in the model is compared to the male:female ratio from field surveys. The difference indicates how closely the simulated data match the survey data. If the values are similar, it is assumed that the model is accurately estimating populations. If they are not, values of unknown variables (initial populations and non-hunt mortality rates) are adjusted until the ratios from the simulation approximate those from annual surveys.

For all game species identified in this Strategic Plan, management objectives were developed by considering historical harvest levels and hunter participation rates and then projecting reasonable ranges that are likely to be met within the 6-year period of the plan. These ranges consider: changes in population levels due to climatic conditions (i.e. small game) or to active population management (i.e. bighorn sheep and pronghorn); changes in harvest strategies (i.e. black bear and mountain lion); or concerns related to habitat condition (i.e. elk).

Big Game Species

Mule Deer

Status and Use

Estimates for the statewide population in 1999 are as follows: 110,000 post-hunt adults (Fig. 5); 60,000 mi² of occupied habitat, including 2400 mi² classified as high quality habitat; 8100 animals harvested (Fig. 6) during 249,500 hunter days; and 16,420 archery hunters and 64,969 first choice applicants for 33,569 authorized permits. Mule deer numbers fluctuate annually due to weather, habitat, predation, competition, and many other factors. Note: these estimates do not include tribal lands or National Parks.

Goal

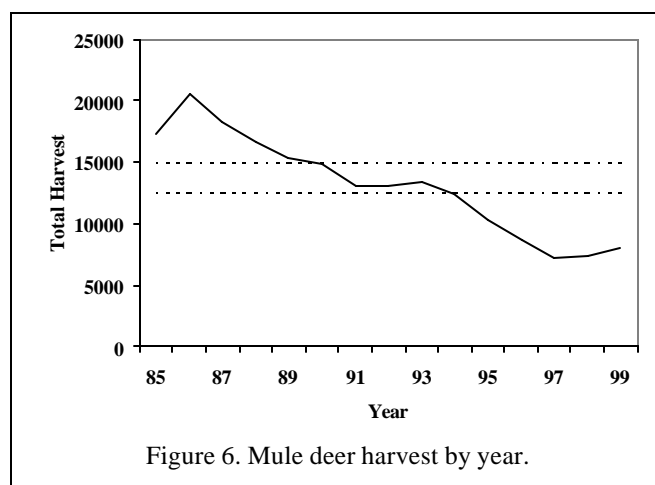
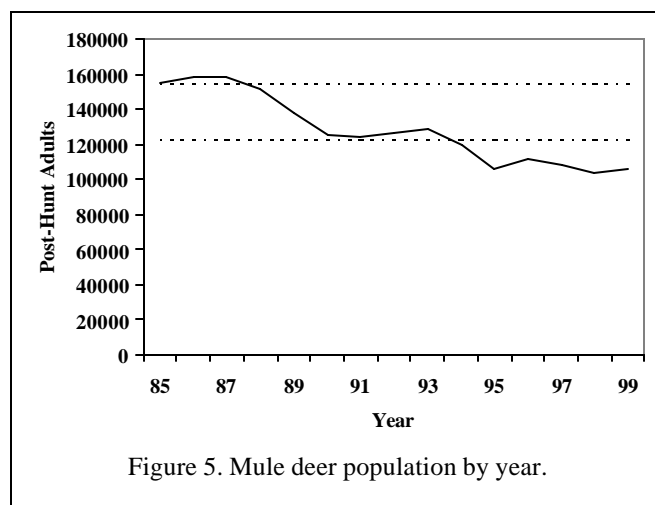
Maintain mule deer populations at levels that provide diverse recreational opportunities.

Objectives

1. Maintain a statewide population of 123,000 to 154,000 post-hunt adult mule deer.
2. Maintain annual harvest at 12,500 to 15,000 mule deer.
3. Provide recreational opportunity for 70,000 to 83,000 hunters per year.
4. Provide 310,000 to 340,000 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Use standardized surveys and population and hunt modeling to assist in permit recommendations. Base harvest objectives on population targets and habitat objectives.
2. Issue permits considering hunter access and demand rates for various weapon types.
3. In Game Management Units 12A, 12B, 13A, 13B, 36B, 45A, 45B, and 45C, offer buck hunting opportunities that emphasize harvest of older age class animals, reduced



hunter densities, and higher hunter success. Specific mule deer management guidelines for these units will be included in an “Alternative Mule Deer Management Plan.”

4. Improve the condition of declining or low density herds through habitat improvement, research, conservative hunt management, or predator management.
5. Coordinate with the Arizona Department of Transportation to determine the extent of vehicle-deer collisions and to identify possible mechanisms by which to reduce the incidence or severity of such collisions.
6. Coordinate with land management agencies, property owners, and lessees to mitigate land uses that are detrimental to mule deer.
7. Manage and enhance habitats through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

White-tailed Deer

Status and Use

Estimates for the statewide population in 1999 are as follows: 80,000 post-hunt adults (Fig. 7); 9000 mi² of occupied habitat, including 900 mi² classified as high quality habitat; 3600 animals harvested (Fig. 8) during 87,840 hunter days; and 3850 archery hunters and 30,573 first-choice applicants for 15,797 authorized permits. Note: these estimates do not include tribal lands or National Parks.

Goal

Maintain white-tailed deer populations at levels that provide diverse recreational opportunities.

Objectives

1. Maintain a statewide population of 85,000 to 95,000 post-hunt adult white-tailed deer.
2. Maintain annual harvest at 5000 to 6000 white-tailed deer.
3. Provide recreational opportunity for 21,000 to 24,000 hunters per year.
4. Provide 80,000 to 100,000 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Use standardized surveys and population and hunt modeling to assist in permit recommendations.
2. Manage white-tailed deer independently of mule deer, to the extent practicable.
3. Issue permits in consideration of hunter access, season structures, and demand rates for various weapon types.
4. Coordinate with land management agencies, property owners, and lessees to mitigate land uses that are detrimental to white-tailed deer.
5. Manage and enhance habitats through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

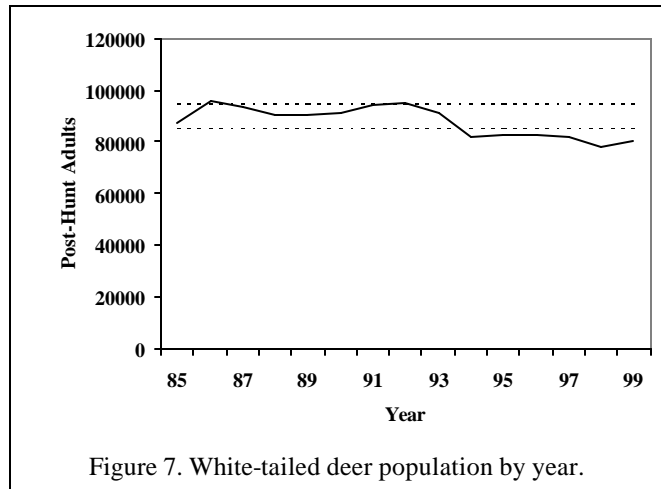


Figure 7. White-tailed deer population by year.

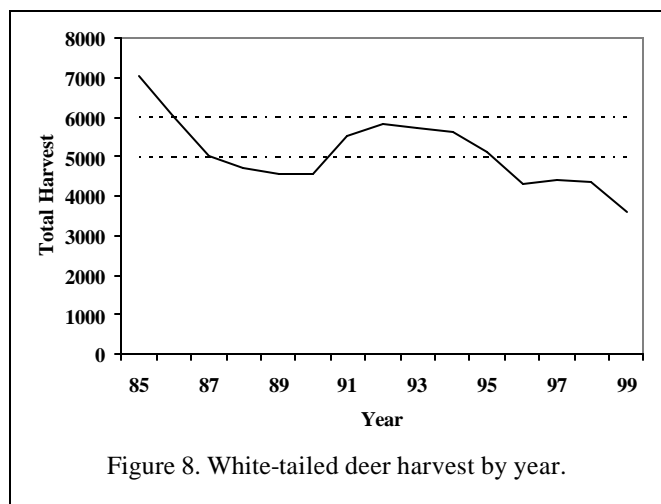


Figure 8. White-tailed deer harvest by year.

Pronghorn

Status and Use

Estimates for the statewide population in 1999 are as follows: 8000 post-hunt adults (Fig. 9); 21,000 mi² of occupied habitat, including 250 mi² classified as high quality habitat; 570 animals harvested (Fig. 10) during 4800 hunting days; and 20,411 first choice applicants for 1190 authorized permits. Note: these estimates do not include tribal lands or National Parks.

Goal

Maintain pronghorn populations at levels that provide diverse recreational opportunities.

Objectives

1. Maintain a statewide population of 8250 to 10,000 post-hunt adults.
2. Maintain annual harvest at 600 to 800 pronghorn.
3. Provide recreational opportunity for 1200 to 1600 hunters per year.
4. Provide 4500 to 6000 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.
6. Restore the historical range in Arizona by repopulating through transplants.

Species-Specific Strategies

1. Manage and enhance habitat through partnerships with public agencies, property owners, lessees, and conservation organizations.
2. Improve conditions of declining or low-density herds through research, conservative hunt management, supplemental transplants, and predator management.
3. Establish self-sustaining pronghorn populations at all transplant sites.
4. Identify important habitats for populations and determine where protection and improvement are possible, in cooperation with land management agencies, property owners, and lessees.
5. Use population and hunt modeling to assist in permit recommendations.
6. Provide hunter recreation that stresses the quality of the hunting experience.

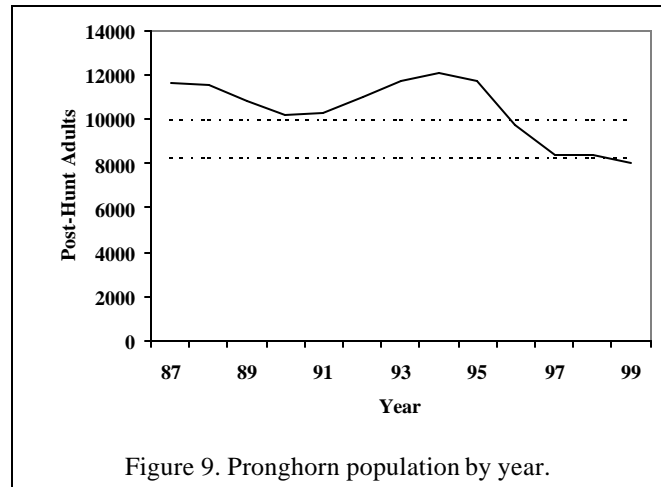


Figure 9. Pronghorn population by year.

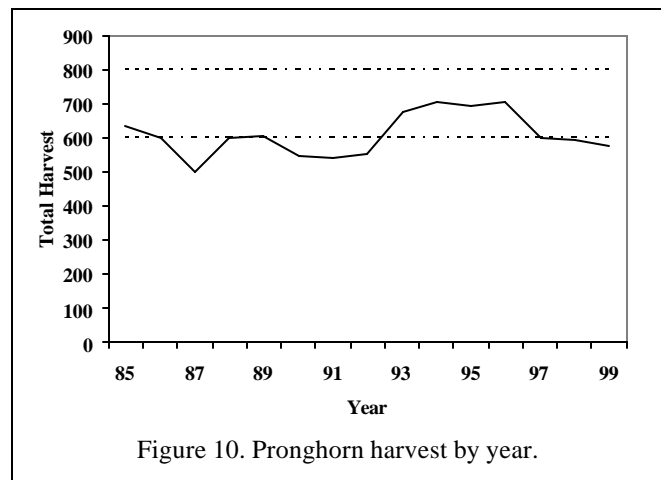


Figure 10. Pronghorn harvest by year.

Elk

Status and Use

Estimates for the statewide population in 1999 were as follows: 26,000 post-hunt adults (Fig. 11); 7800 mi² of occupied habitat, including 1300 mi² classified as high quality habitat; 9800 animals harvested (Fig. 12) during 101,100 hunter days; and 94,835 first choice applicants for 23,346 authorized permits. Note: these estimates do not include tribal lands or National Parks.

Goal

Maintain elk populations at levels that provide diverse recreational opportunities, while minimizing substantiated depredation complaints.

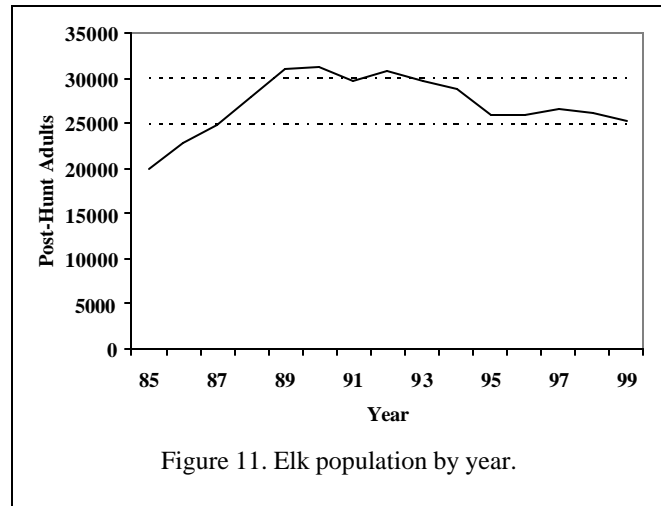


Figure 11. Elk population by year.

Objectives

1. Maintain a statewide population of 25,000 to 30,000 post-hunt adult elk. Address local issues in Regional Operational Plans that may impact localized populations, despite current statewide population levels.
2. Maintain annual harvest at 7500 to 12,000 elk.
3. Provide recreational opportunity for 16,000 to 25,000 hunters per year.
4. Provide 70,000 to 110,000 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Design hunt recommendations that address population management objectives and substantiated depredation complaints.
2. Use standardized surveys and population and hunt modeling to assist in permit recommendations. Base management on population targets, herd units, and habitat objectives.
3. Develop cooperative action plans, including monitoring, with property owners, lessees, and land management agencies to minimize elk-livestock interactions.

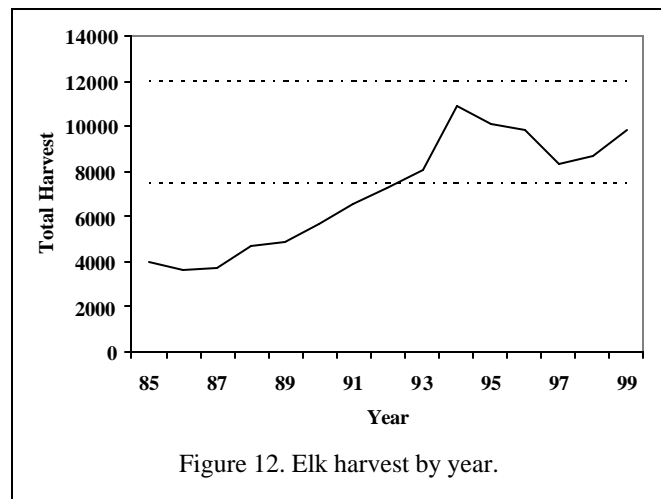


Figure 12. Elk harvest by year.

4. Coordinate with tribal authorities for elk management.
5. Issue permits in consideration of demand rates for various weapon types.
6. Local Habitat Partnership Committees will identify ways to manage and enhance elk habitat through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations, and help maintain communication among individuals interested in elk management.
7. Use Regional Elk Operational Plans, which will be reviewed annually by the Commission, to direct elk management goals and objectives.
8. Develop a standardized survey protocol that produces survey-generated population estimates.
9. Coordinate with the Arizona Department of Transportation to determine the extent of vehicle-elk collisions and to identify possible mechanisms by which to reduce the incidence or severity of such collisions.
10. Update elk distribution maps within the Department's Geographic Information System databases.

Turkey

Status and Use

Estimates for the statewide turkey population in 1999 are as follows: 7800 mi² of occupied habitat, including 940 mi² classified as high quality habitat; 1930 turkeys harvested (Fig. 13) during 32,500 hunter days (fall 1999 season = 980 turkeys harvested during 18,400 hunter days; spring 2000 season = 950 bearded turkeys harvested during 14,100 hunter days); 11,322 first choice applicants for 5015 authorized spring permits; 9077 applicants for 4260 fall permits; and 2133 archery tags. Note: these estimates do not include tribal lands or National Parks.

Goal

Maintain turkey populations at levels that provide diverse recreational opportunities, and maintain and enhance turkey habitat through cooperation with land management agencies.

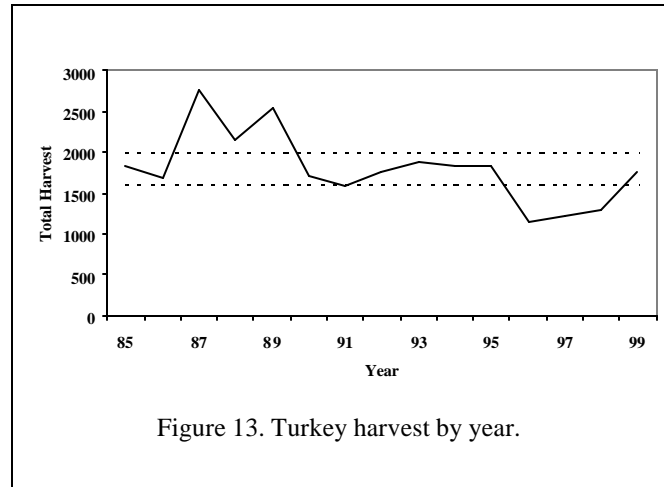


Figure 13. Turkey harvest by year.

Objectives

1. Provide hunter recreation opportunity based on turkey population status and habitat quality.
2. Maintain a harvest of 1600 to 2000 turkeys.
3. Provide recreational opportunity for 10,000 to 14,000 hunters per year.
4. Provide 36,000 to 45,000 hunter days per year.
5. Maintain existing occupied habitat, with an emphasis on contiguous medium and high quality habitat.
6. Maintain the range of all subspecies in Arizona by repopulating historical range through transplants; emphasize reintroduction of Gould's turkey.

Species-Specific Strategies

1. Use the turkey habitat scorecard to identify and priority rank where efforts are needed to improve habitat quality in cooperation with land management agencies, property owners, and lessees.
2. Establish self-sustaining populations at all new transplant sites.
3. Provide hunter recreation that stresses the quality of the hunting experience.
4. Use population status evaluations to determine hunt structure and permit numbers.

Javelina

Status and Use

Estimates for the statewide population in 2000 are as follows: 35,000 mi² of occupied habitat, including 2200 mi² classified as high quality habitat; 7230 animals harvested (Fig. 14) during 87,200 hunter days; 18,277 first choice applicants for 19,935 authorized firearms permits; and 8828 first choice applicants for 9650 archery permits. Note: these estimates do not include tribal lands or National Parks.

Goal

Maintain javelina populations at levels that provide diverse recreational opportunities, while minimizing substantiated depredation and nuisance complaints.

Objectives

1. Maintain a statewide population of 35,000 to 45,000 javelina.
2. Maintain annual harvest at 6500 to 8500 javelina.
3. Provide recreational opportunity for 27,500 to 32,500 hunters per year.
4. Provide 90,000 to 110,000 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Evaluate the Department's Nuisance Javelina Procedures and offer recommendations for retention or change.
2. Issue permits in consideration of demand rates for various weapon types.
3. Manage and enhance habitats through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

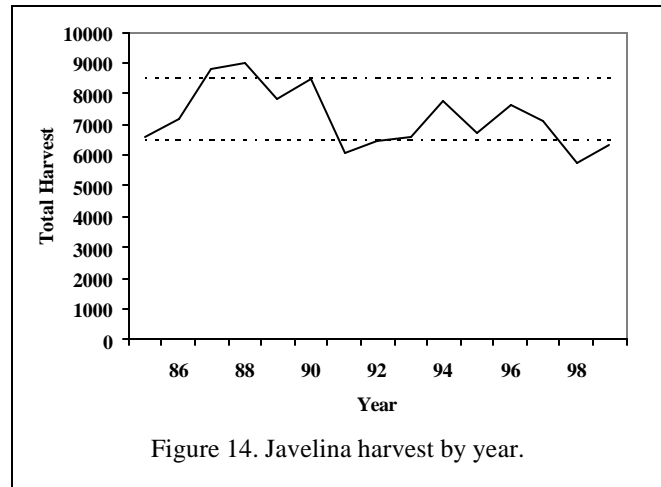


Figure 14. Javelina harvest by year.

Bighorn Sheep

Status and Use

Estimates for the statewide population in 1999 are as follows: 6500 bighorn sheep; 8500 mi² of occupied habitat, including 170 mi² classified as high quality habitat; 104 animals harvested (Fig. 15) during 745 hunter days; and 8408 first choice applicants for 111 authorized permits. Note: these estimates do not include tribal lands or National Parks, Memorials, or Monuments, but do include Lake Mead and Glen Canyon National Recreation Areas.

Goal

Increase bighorn sheep populations and provide diverse recreational opportunities.

Objectives

1. Increase the bighorn sheep population to 7500.
2. Maintain annual harvest at 100 to 120 bighorn sheep.
3. Provide recreational opportunity for 110 to 140 hunters per year.
4. Provide 550 to 750 hunter days per year.
5. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.
6. Maintain the existing range of all subspecies in Arizona, and repopulate historical range through transplants.

Species-Specific Strategies

1. Use population modeling to assist in permit recommendations. Base management on population characteristics, herd units, and habitat potential.
2. Establish self-sustaining populations at all new transplant sites.
3. Evaluate transplant sites for Rocky Mountain bighorn sheep and implement further transplants as appropriate.
4. Provide hunter recreation that stresses the quality of the hunting experience and harvest of older age class rams.
5. Cooperate with land management agencies, property owners, and lessees to reduce adverse interactions between bighorn sheep, feral animals, and domestic livestock.
6. Manage and enhance habitats, specifically including development of new and maintenance of existing water catchments, through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

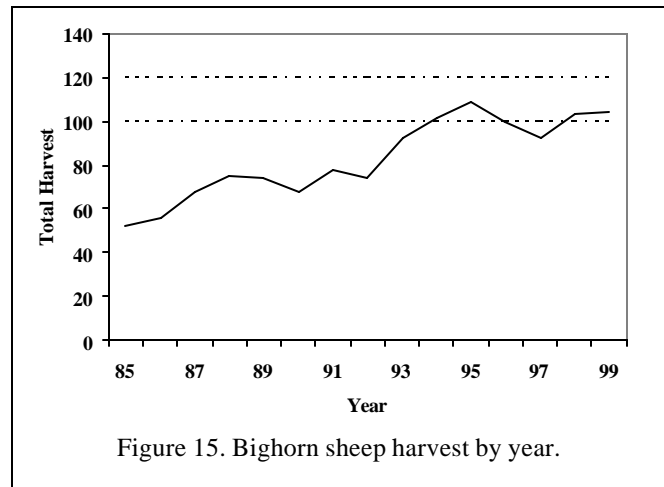


Figure 15. Bighorn sheep harvest by year.

Buffalo¹

Status and Use

Estimates for the statewide population in 1999 are as follows: 206 buffalo on the Department's Houserock Valley Wildlife and Raymond Ranch Wildlife Area; 75,000 acres of occupied habitat (including two State and federal grazing allotments); 38 animals harvested (Fig. 16) during 147 hunter days; and 1380 first-choice applicants for 49 authorized permits. Note: these estimates do not include tribal lands or National Parks, Memorials, Monuments, or Recreation Areas.

Goal

Maintain buffalo populations at levels that provide diverse recreational opportunities.

Objectives

1. Maintain a statewide population of 200 to 300 buffalo.
2. Maintain annual harvest at 40 to 60 buffalo.
3. Provide recreational opportunity for 50 to 80 hunters per year.
4. Provide 125 to 325 hunter days per year.
5. Provide wildlife viewing opportunities for 800 visitors per year at the Department's Houserock Valley Wildlife Area and Raymond Ranch Wildlife Area.

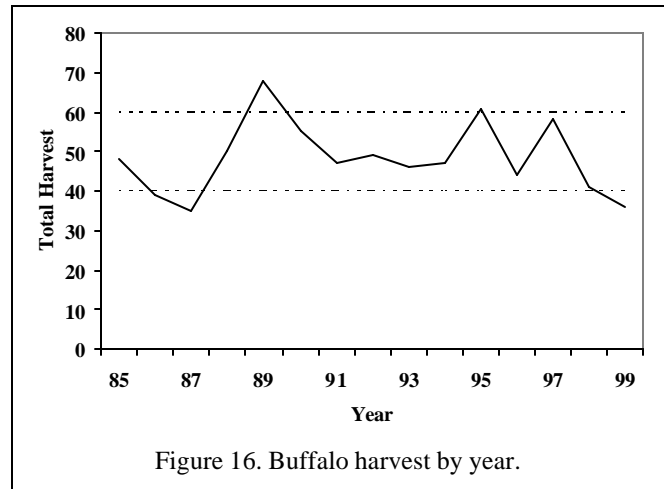


Figure 16. Buffalo harvest by year.

Species-Specific Strategies

1. Maintain herds at levels consistent with good range management practices.
2. Provide a variety of quality hunt and recreational viewing opportunities.
3. Integrate management of other species into the goals of buffalo management.
4. Increase wildlife watching opportunities.
5. Manage and enhance habitats through partnerships with public agencies, property owners and lessees, and wildlife conservation organizations.

¹This document uses the common name for this species that is used in A.R.S. 17, Commission Orders, and the Department's publications on hunting seasons, rather than the name used by the American Society of Mammalogists, "American bison."

Black Bear

Status and Use

Estimates for the statewide population in 1999 are as follows: 2500 black bears; 12,600 mi² of occupied habitat, including 2300 mi² classified as high quality habitat; and 4046 permits sold and 181 animals harvested (Fig. 17). Note: these estimates do not include tribal lands or National Parks.

Goal

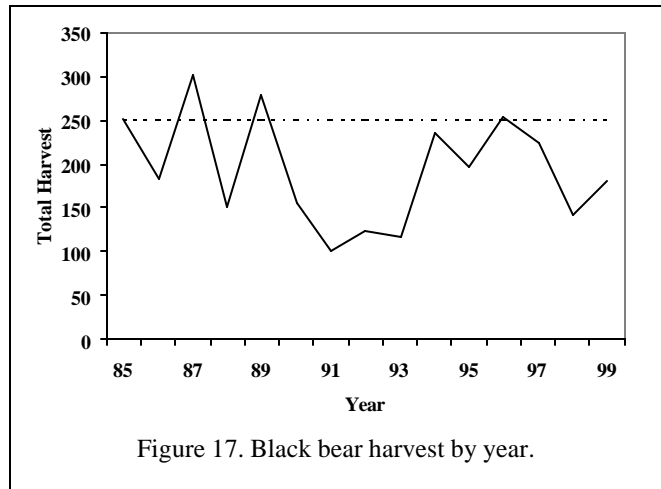
Manage the black bear population, its numbers and distribution, as an important part of Arizona's fauna. Provide bear hunting and other related recreational opportunities.

Objectives

1. Maintain an annual harvest of no more than 125 female bears (including depredation take), with a total harvest of 250 or more bears (including males).
2. Provide recreational opportunity to 4000 to 7000 hunters per year.
3. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Maintain a complete database from all harvest sources through a mandatory check-out system, including age, sex, kill location, etc., to develop population trend information. Conduct a hunter questionnaire biannually.
2. Identify important habitats for bear populations and ensure protection, and improvement where possible, through cooperation with land management agencies and landowners.
3. Implement hunt structures to direct harvest emphasis toward the male segment of the bear population.
4. As bear hunt areas become defined, determine population numbers and characteristics on a hunt-area basis.
5. Cooperate with land management agencies to reduce conflicts between bears and humans, and increase public awareness of bears and their habitat, to reduce nuisance problems.
6. Implement hunt structures to direct harvest emphasis towards areas with high bear populations and where depredation and nuisance complaints are substantiated.



Mountain Lion

Status and Use

Estimates for the statewide population in 1999 are as follows: 2500 mountain lions; 62,000 mi² of occupied habitat, including 10,700 mi² classified as high quality habitat; and 6826 permits sold and 246 animals harvested (Fig. 18).

Note: these estimates do not include tribal lands or National Parks.

Goal

Manage the mountain lion population, its numbers and distribution, as an important part of Arizona's fauna. Provide mountain lion hunting (including hunting with dogs) and other related recreational opportunities.

Objectives

1. Maintain annual harvest at 250 to 300 mountain lions (including depredation take).
2. Provide recreational opportunity for 3000 to 6000 hunters per year.
3. Maintain existing occupied habitat and maintain the present range of mountain lions in Arizona.

Species-Specific Strategies

1. Maintain a complete database from all harvest sources, through a mandatory check-out system, including age, sex, kill location, etc. to index population trend.
2. Conduct a hunter questionnaire biannually.
3. Evaluate the management implications of population and relative density estimates.
4. Implement hunt structures to increase and direct harvest emphasis toward areas with high lion populations, and where depredation complaints are substantiated, and evaluate the effectiveness of these efforts.
5. Determine population numbers and characteristics on a hunt-area basis.
6. Increase public awareness of mountain lions and their habits, to reduce conflicts with humans.
7. Implement the Department's Predation Management Policy.

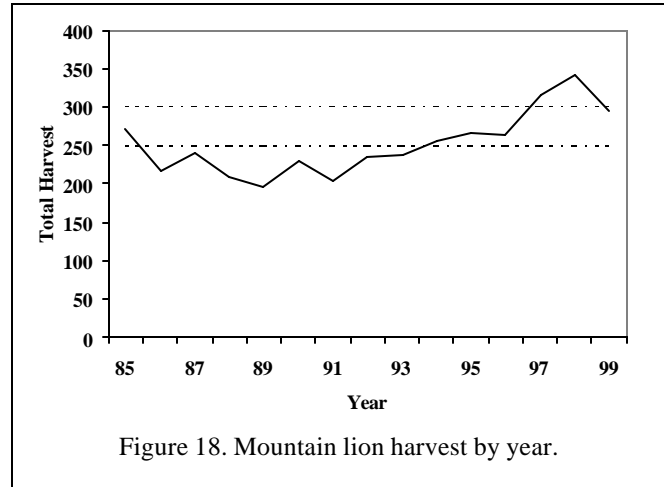


Figure 18. Mountain lion harvest by year.

Small Game Species

Status

Arizona's small game species include cottontail rabbits, tree squirrels, upland game birds (quails, chukar, grouse, and pheasants), and migratory game birds (ducks, geese, swan, sandhill cranes, coot, gallinule, common snipe, mourning and white-winged doves, and band-tailed pigeon). One or more of these species occur in virtually all vegetation types throughout Arizona, from the highest mountains to the lowest plains; forests, wetlands, and deserts; and farmlands, cities, and wilderness.

The determining factor controlling small game numbers in Arizona is the quality and quantity of habitats, which in turn often reflects climatic variations. This plan emphasizes small game management through monitoring, preservation, and manipulation of habitats.

Supply and Demand

Many small game animals have adapted to human presence. White-winged and mourning doves nest in Phoenix and Tucson, gray and Abert's squirrels frequent feeders in Payson, and waterfowl graze suburban golf courses virtually statewide. This close association of small game animals and the human residents of Arizona provides many opportunities for hunting and for wildlife photography, observation, and study.

Small game species represent a resource that is generally under-used by hunters. Use levels often are correlated with rainfall cycles, because small game abundance drops in periods of drought. The number of hunters in the field is also affected by concern for zoonotic diseases, although not all of these concerns are well founded. Although rabbits sometimes do carry plague and tularemia, these diseases are not often conveyed to humans. Rabbits and tree squirrels are also widely perceived by the public to carry hantavirus. However, studies conducted by the Centers for Disease Control suggest that if these mammals do carry the virus, it is not common in them. Deer mice are far more likely to harbor hantavirus than rabbits or tree squirrels.

Nevertheless, the public is concerned about the possibility of exposure to diseases that are, or may be, carried by small game animals. Thus, the Department is developing information to help alleviate these concerns so the public can more fully appreciate and enjoy the outdoor recreation represented by small game mammals. The information will include precautions to take while hunting or camping, to minimize any health risk.

Small game hunting opportunity is the combination of areas open, season length, and bag limit. Supply is the amount of hunter opportunity the small game resource can provide on a sustained yield basis. The supply of hunting opportunity for small game species continues to exceed the demand placed on it by hunters.

For most small game species strategic plans, supply is not quantified because the breeding populations are unaffected by hunting. The Department will monitor the response of small game species to hunting and will restrict hunting pressure if hunting is found to adversely affect

breeding populations. However, determining the size of small game populations is difficult at best. These populations respond quickly to changing environmental conditions. When conditions are favorable, populations increase. When the reverse is true, populations decrease.

A "typical" small game animal with a well-defined reproductive season also has a predictable annual population cycle (Fig. 19). The population is lowest just before the young are born. It is highest when the ratio of the young being born to the number dying is greatest. The period when young appear may last for several days to many weeks, even throughout the spring and summer. The duration depends on the species, weather, condition of the adult(s), and food availability. These factors also affect birth rates and mortality rates. Juvenile mortality tends to be higher than adult mortality.

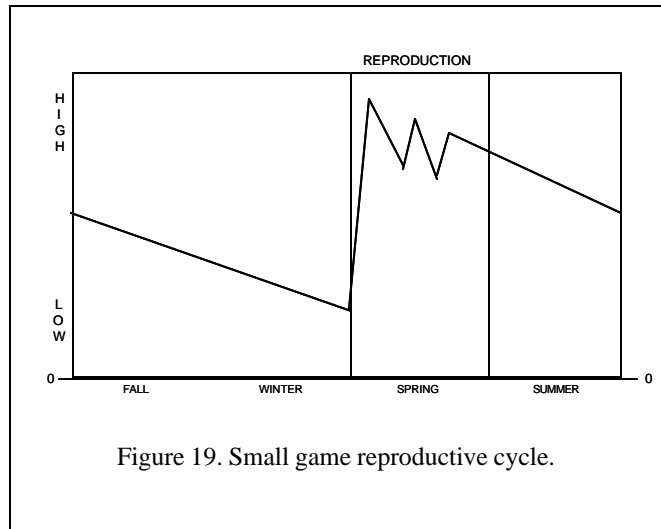


Figure 19. Small game reproductive cycle.

The population continues to fluctuate as the young are born and die. Eventually, the young stop appearing, adult and juvenile mortality continue, and the population begins decreasing. How high the population is after the annual natality period ends also depends on how many adults have young, the species' reproductive potential, condition of the adults, weather, and food availability.

Small game mortality results from a very long list of causes, such as predation, starvation, disease, hunting, and accidents. Thus, populations are dynamic and cycle annually. If conditions are good, the population cycles upward. If conditions are bad, the population cycles downward.

Small game populations can take advantage of favorable environmental conditions faster than larger animals. Small game animals usually have high reproductive potential. Under favorable conditions, their populations may increase by as much as 200 to 600 percent in a single breeding season.

The number of individuals in the population at the onset of the reproductive period influences how high the population can go. The number of individuals reaching this age is dependent on how many survive, which is dependent on environmental conditions and reproductive success during the previous year. This is why, when two or three years of favorable years occur back-to-back, small game population levels can become very high. The reverse is also true: if two or three bad years occur together, the population declines (see Gambel's and scaled quail graphs, Figs. 24, 25). In turn, the number of hunters afield is a direct response to the real or perceived abundance of small game animals.

The objectives of the following plans emphasize the availability of hunting opportunity, not the actual use. The number of hunters, the number of days they hunt, and the number of animals they take per day is dependent on the number of animals available.

The small game accounts that follow are based on data from 1985-99. Also, please note that: (a) the Department has restricted hunting pressure on doves by opting for reduced shooting hours during the September season and continues to closely monitor sandhill crane hunts; and (b) the Department will continue to actively manage and acquire waterfowl production areas within the State, through revenues provided by an Arizona waterfowl stamp.

Tree Squirrels

Status and Use

Arizona's four native species of tree squirrels occur in forests and well developed riparian deciduous forests. They occupy about 7800 mi² of habitat, of which more than 60 percent is in National Forests. During the 1999 season approximately 86,450 tree squirrels were harvested (Fig. 20), providing about 46,900 days of hunting recreation (Fig. 21).

The Mount Graham red squirrel is an endangered species that occurs only in the Pinaleno Mountains of southeastern Arizona. This area is closed to the take of red squirrels.

Goal

Maintain or enhance tree squirrel habitat through cooperation with land management agencies. Continue to allow for recreation, economic, aesthetic and educational uses.

Objectives

1. Maintain annual harvest at 50,000 to 100,000 tree squirrels.
2. Maintain hunter success rate at 1.5 to 2.1 squirrels per day.
3. Provide 25,000 to 50,000 hunter days per year.
4. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.
5. Maintain the range of all subspecies in Arizona.

Species-Specific Strategies

1. Develop standardized surveys to inventory populations and evaluate existing habitat.
2. Develop tree squirrel habitat evaluation scorecards to assess habitat conditions.
3. Coordinate with land management agencies to mitigate other land uses that are detrimental to tree squirrels.

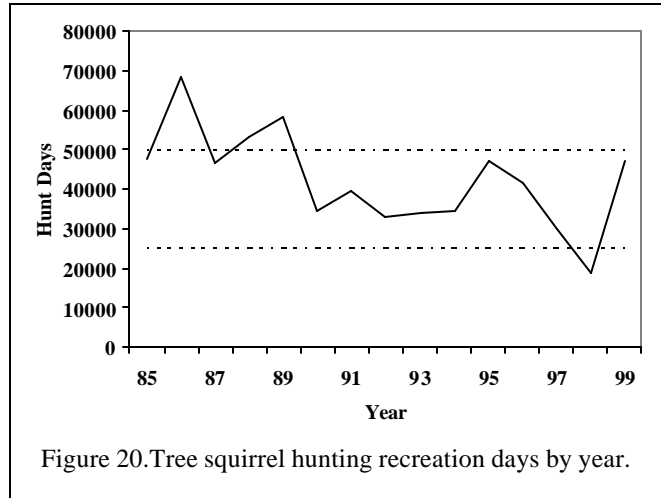


Figure 20. Tree squirrel hunting recreation days by year.

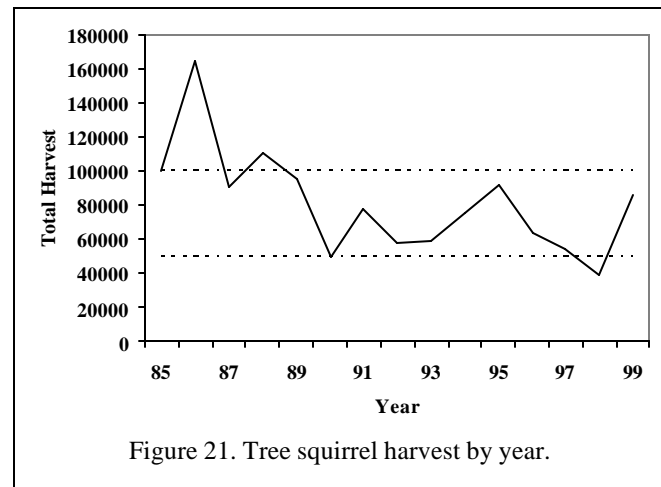


Figure 21. Tree squirrel harvest by year.

Cottontail Rabbits

Status and Use

Three species of cottontail rabbits occur in Arizona. They occur throughout most habitats in the State, occupying about 135,000 mi² (14% State, 20% USFS, 15% BLM). Their populations are highly unstable, and subject to wide fluctuations due to weather patterns. These fluctuations are reflected in hunting statistics. During the 1999 season, approximately 62,000 cottontails were harvested (Fig. 22), providing about 61,750 days of hunting recreation (Fig. 23).

Goal

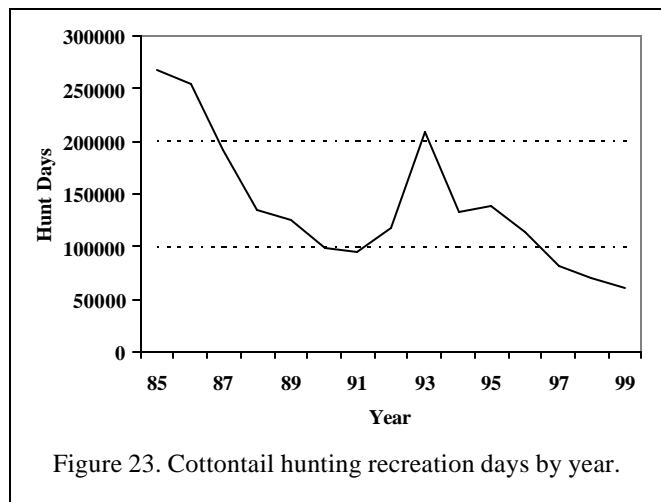
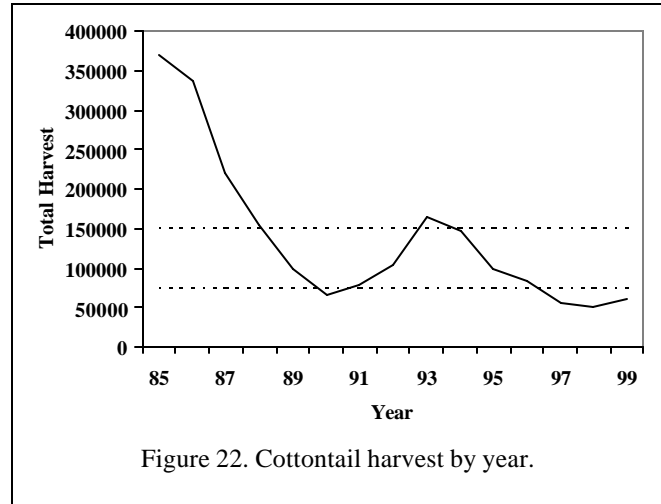
Maintain or enhance cottontail hunting opportunity by improving access to existing habitat, coordinating with other agencies to improve habitat, and protecting primary cottontail habitat from development.

Objectives

1. Maintain annual harvest at 75,000 to 150,000 cottontails.
2. Maintain hunter success rate at 0.8 to 1.2 cottontails per day.
3. Provide 100,000 to 200,000 hunter days per year.

Species-Specific Strategies

1. Enhance hunter opportunities in proximity to metropolitan areas.



Gambel's Quail and Scaled Quail

Status and Use

Gambel's quail is Arizona's most abundant non-migratory game bird. It occurs in the southwestern two-thirds of the State, on about 67,000 mi² of habitat (22% BLM, 20% private, 18% State, and 13% USFS). It comprises about 90 percent of the total annual quail harvest. The scaled quail is found in the southeastern Arizona grasslands, occupying about 9000 mi² of habitat (40% State, 40% private). During the 1999 hunting season, about 761,250 Gambel's and scaled quail were harvested (Fig. 24), providing about 284,570 days of hunting recreation (Fig. 25). These two species overlap almost completely in habitat. Hunters may encounter mixed flocks with both species. The two species are currently managed together for season dates and bag limits.

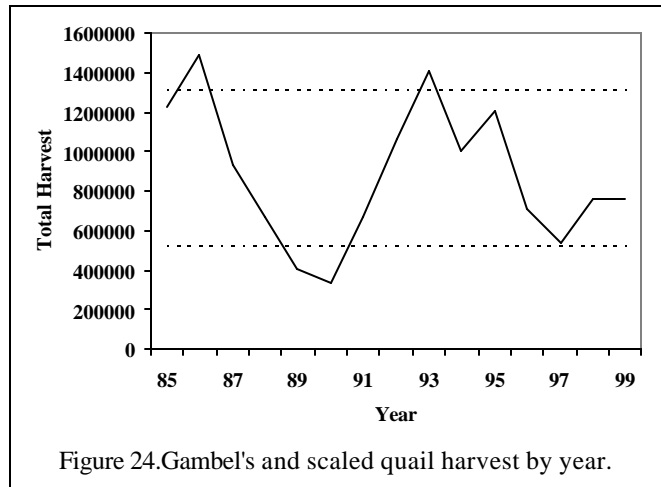


Figure 24. Gambel's and scaled quail harvest by year.

Goal

Maintain or enhance current levels of Gambel's and scaled quail hunting opportunity by improving access to existing habitat, and coordinating with other agencies to improve habitat, and protect primary Gambel's and scaled quail habitat from development.

Objectives

1. Maintain annual harvest at 524,000 to 1,314,000 Gambel's and scaled quail.
2. Maintain hunter success rate at 2.2 to 3.5 birds per day.
3. Provide 222,000 to 392,000 hunter days per year.

Species-Specific Strategies

Gambel's Quail

1. Develop standardized surveys to inventory populations and evaluate existing habitat.
2. Coordinate with land management agencies to ensure that livestock grazing of quail habitat is within allowable-use guidelines that provide quail with adequate food and cover.
3. Collect data to estimate demand and harvest more accurately.
4. Develop species-specific objectives for Gambel's quail.

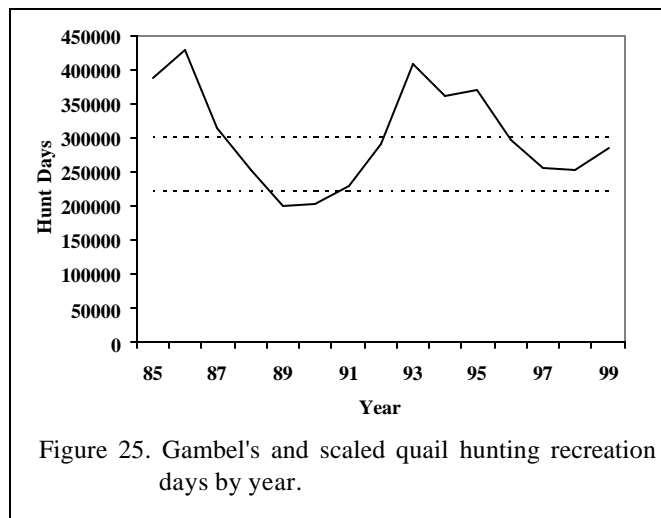


Figure 25. Gambel's and scaled quail hunting recreation days by year.

Scaled Quail

1. Develop standardized surveys to inventory populations and evaluate existing habitat.
2. Coordinate with land management agencies to ensure that livestock grazing of quail habitat is within allowable use guidelines that provide quail with adequate food and cover.
3. Support research into scaled quail population levels, distribution, and habitat requirements.
4. Collect data to estimate demand and harvest more accurately.
5. Develop species-specific objectives for scaled quail.

Mearns' Quail²

Status and Use

Mearns' quail primarily occur in the woodlands and wooded grasslands of the mountains of southeastern Arizona. They occupy about 3700 mi² of this habitat (61% USFS). In 1999, approximately 29,000 Mearns' quail were harvested (Fig. 26), providing about 25,500 days of hunting recreation (Fig. 27).

Goal

Maintain or enhance Mearns' quail habitat through cooperation with land management agencies. Continue to allow for recreation, economic, aesthetic, and educational uses.

Objectives

1. Maintain annual harvest at 20,000 to 35,000 Mearns' quail.
2. Maintain hunter success rate at 1.3 to 2.0 Mearns' quail per day.
3. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

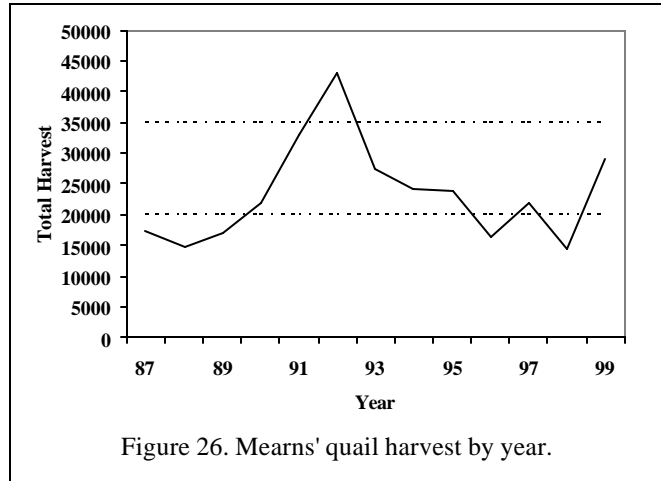


Figure 26. Mearns' quail harvest by year.

Species-Specific Strategies

1. In cooperation with public and private partners, develop guidelines, using the most recent Department research, for Mearns' quail population and habitat management.
2. Coordinate with the Coronado National Forest to ensure that Mearns' quail population potential is achieved through enforcement of current Department standards and guidelines for high quality habitat until new Department standards and guidelines are established.
3. Support research into the effects of large-area overstory removal (trees and shrubs, including manzanita, oak, and juniper) on Mearns' quail population levels and distribution.

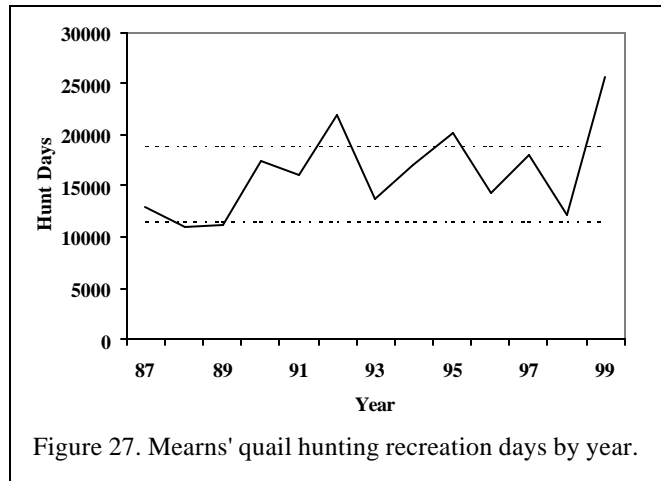


Figure 27. Mearns' quail hunting recreation days by year.

² This document uses the common name for this species that is used in A.R.S. Title 17, Commission Orders, and the Department's publications on hunting seasons, rather than the name used by the American Ornithologists' Union, "Montezuma quail."

4. Evaluate the potential for habitat and population enhancement of Mearns' quail in areas of central Arizona with Madrean vegetation, and implement management actions as appropriate.
5. Collect data to estimate demand and harvest more accurately.

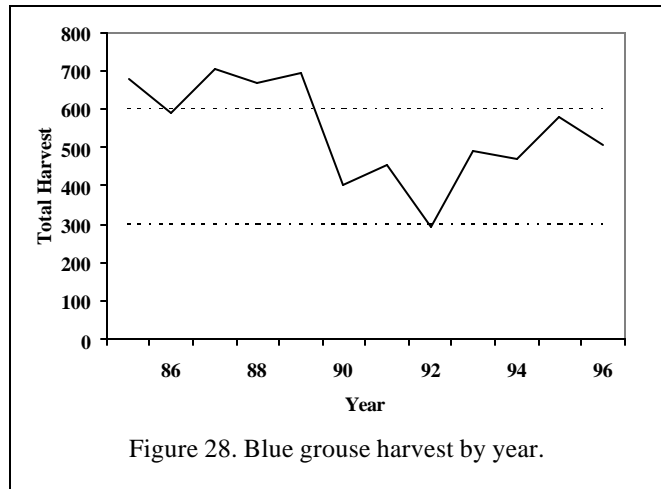
Blue Grouse

Status and Use

In Arizona, blue grouse are restricted to the White Mountains, San Francisco Mountains, and Kaibab Plateau. They occupy about 990 mi² of habitat (90% USFS). In 1996, approximately 500 blue grouse were harvested (Fig. 28), providing about 2250 days of hunting recreation (Fig. 29). The Game Bird Questionnaire, used to obtain hunter and harvest data for blue grouse, was discontinued in 1997. The Migratory Bird Stamp program will provide such data in the future.

Goal

Maintain or improve blue grouse habitat through cooperation with land management agencies. Continue to allow for recreation, economic, aesthetic, and educational uses.

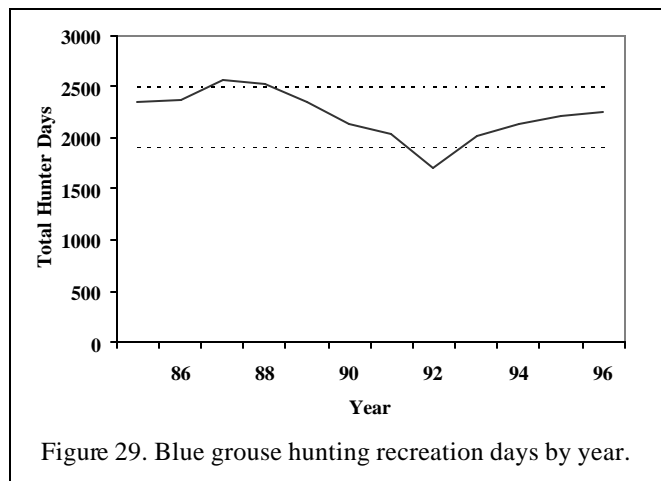


Objectives

1. Maintain annual harvest at 300 to 600 blue grouse.
2. Maintain hunter effort at 0.2 to 0.3 birds per day.
3. Provide 1900 to 2500 hunter days per year.
4. Maintain existing occupied habitat, with emphasis on retention of medium and high quality habitat.

Species-Specific Strategies

1. Coordinate with land management agencies to ensure that livestock grazing in blue grouse habitat is within allowable use guidelines that provide grouse with adequate food and cover.
2. Coordinate with land management agencies to encourage timber cuts to create small openings and stimulate herbaceous growth and berry production.



White-winged Dove and Mourning Dove

Status and Use

Arizona's white-winged doves and mourning doves have been influenced by human activities more than any other small game species in the State. Ninety-five percent of all Arizona mourning dove band recoveries between 1967 and 1975 were from the Arizona breeding population. The white-winged dove harvest consists exclusively of birds reared within the State. In 1999, 142,200 white-winged doves and 1,314,800 mourning doves were harvested (Figs. 30, 31), providing 371,400 days of hunting recreation (Figs. 32, 33).

Goal

Maintain or enhance populations of white-winged and mourning doves as important parts of Arizona's fauna while providing recreational opportunity to as many individuals as possible. This requires promoting land management practices that benefit wildlife, and either conducting or supporting research in areas where additional information is needed.

Objectives

1. Maintain annual harvest at 80,000 to 165,000 white-winged and 820,000 to 1,500,000 mourning doves.
2. Maintain daily hunter success rates at 1.2 to 1.6 white-winged doves and 4.7 to 5.7 mourning doves per day.
3. Provide 65,000 to 120,000 white-winged dove hunter days per year, and 160,000 to 280,000 mourning dove hunter days per year.
4. Within federal season frameworks, maximize hunting opportunities for all white-winged and mourning dove hunters, with special emphasis on youth and female hunters.

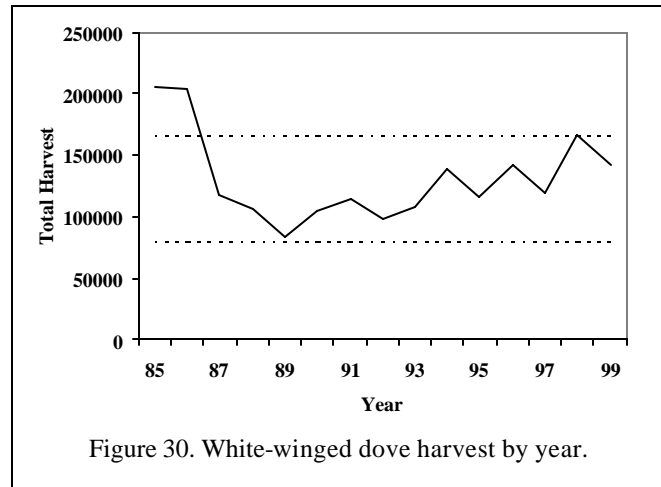


Figure 30. White-winged dove harvest by year.

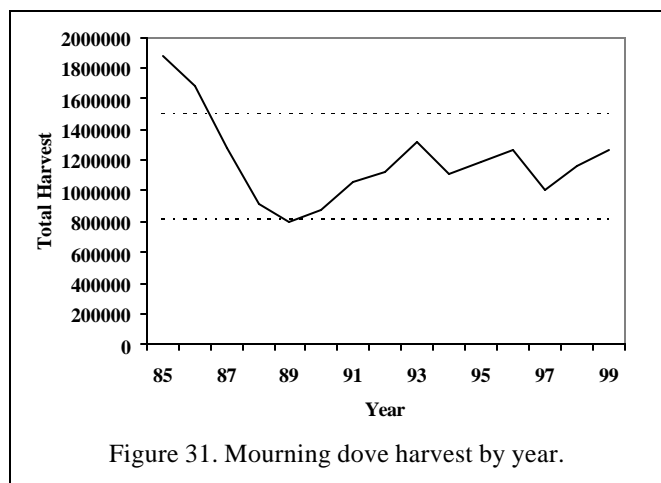


Figure 31. Mourning dove harvest by year.

Species-Specific Strategies

1. Maintain existing population surveys, including the annual Call Count Surveys.
2. Continue developing a program to involve public and private farmers in planting food plots and nesting habitats.
3. Implement hunt structures that maintain and enhance dove populations. When populations have recovered to allow for additional harvest, bag limits and seasons should be liberalized. The framework recommendations should be specified in the Pacific Flyway Management Plan for the Western White-winged Dove.
4. Improve dove populations through management agreements or land purchases to retain quality nesting and feeding habitat.

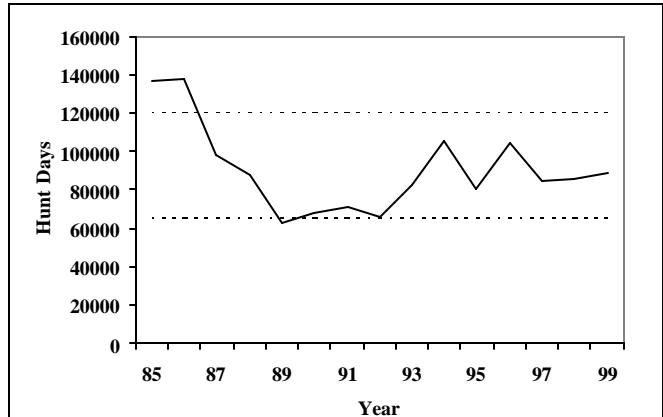


Figure 32. White-winged dove hunting recreation days by year.

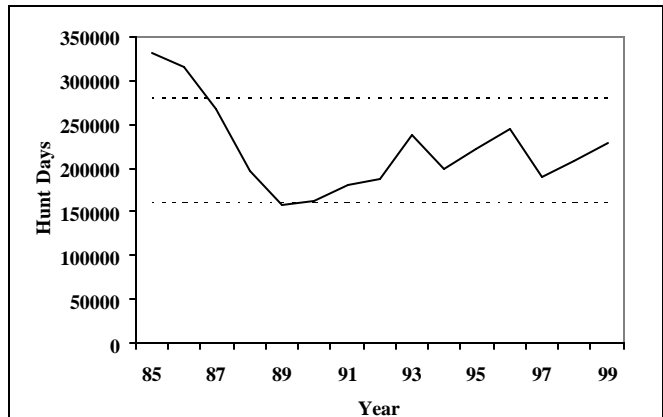
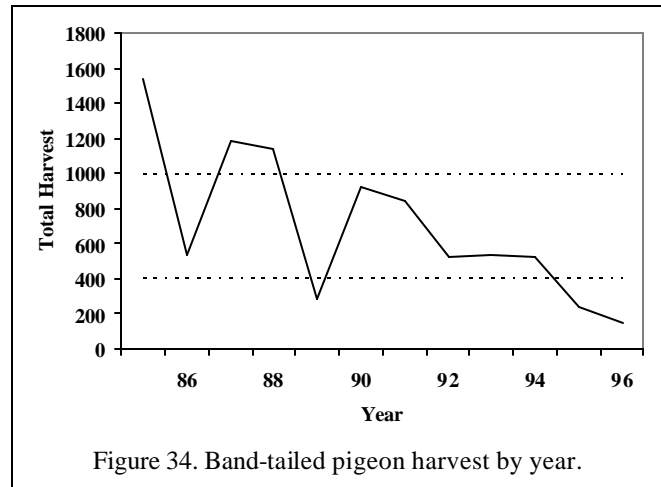


Figure 33. Mourning dove hunting recreation days by year.

Band-tailed Pigeon

Status and Use

Band-tailed pigeons in Arizona are found in coniferous forests, oak-juniper woodland, and chaparral of the eastern two-thirds of the State, about 38,000 mi² (40% USFS, 16% State, 16% private, 7% BLM). Their numbers in specific locations vary from year to year, depending on food supply. In 1996, 150 band-tailed pigeons were harvested (Fig. 34), providing 650 days of hunting recreation (Fig. 35). The Game Bird Questionnaire which was used to obtain hunter and harvest data for band-tailed pigeon was discontinued in 1997. The Migratory Bird Stamp program will provide such data in the future. Note: the Western Management Unit for the band-tailed pigeon is currently re-drafting the management plan for this species.



Goal

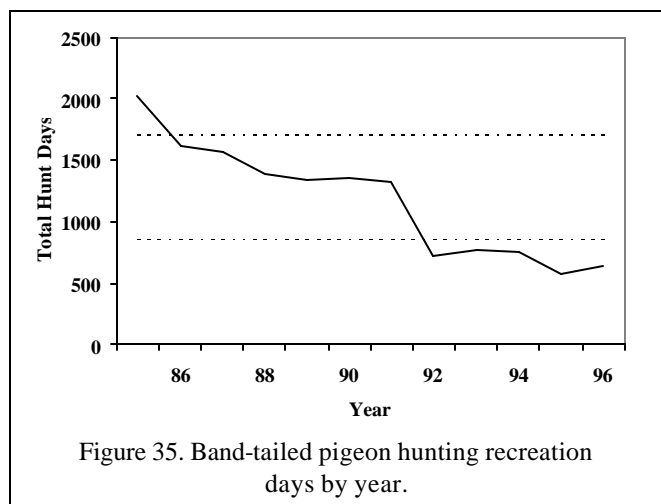
Maintain or enhance band-tailed pigeon habitat through cooperation with land management agencies, and continue to allow for recreation, economic, aesthetic, and educational uses.

Objectives

1. Maintain annual harvest at 400 to 1000 band-tailed pigeons.
2. Maintain hunter success rate at 0.4 to 0.8 band-tails per day.
3. Provide 850 to 1700 hunter days per year.
4. Maintain existing occupied band-tailed pigeon habitat, with emphasis on medium and high quality habitat.

Species-Specific Strategies

1. Coordinate with land management agencies to mitigate land uses detrimental to band-tailed pigeons.
2. Re-institute a trapping and banding program, and develop and maintain a database for the information gathered.
3. Create a database of identified critical breeding areas.
4. Evaluate season dates and length of season.



Waterfowl

Status and Use

Most waterfowl that migrate through or winter in Arizona nest in the Great Basin area of the Inter-Mountain West. An important factor in determining waterfowl numbers is the condition of wetlands during migration. Waterfowl abundance in Arizona does not necessarily reflect national or flyway population levels. Through the 1980s, drought conditions afflicted major duck production areas and caused population declines. Conditions improved in 1993 and 1994. In 1999, 42,000 ducks and 5200 geese were harvested in Arizona (Figs. 36, 37), providing 32,800 days of hunting recreation (Fig. 38). Disturbance by water-oriented recreationists reduces the availability of production and wintering habitat. Note: the Department participates as a member state in the Pacific Flyway Study Committee and Council. Where species management overlap exists, the Pacific Flyway Council coordinates western waterfowl management with the Central Flyway Council.

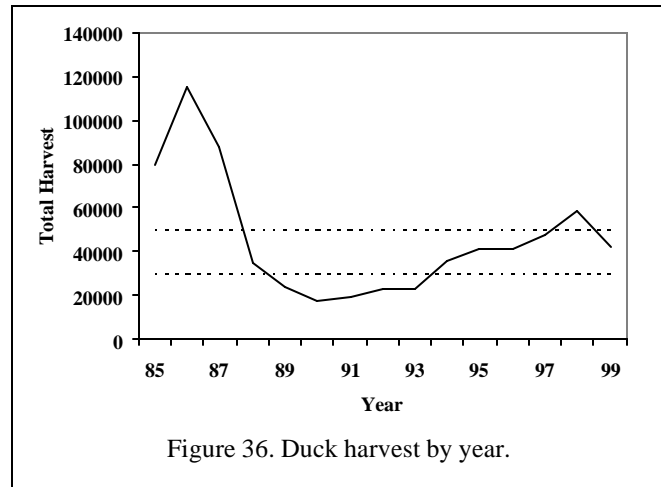


Figure 36. Duck harvest by year.

Goal

Increase waterfowl production and wintering populations within Arizona through habitat acquisition and development; and provide recreational opportunity to as many individuals as possible.

Objectives

1. Maintain annual harvest at 30,000 to 50,000 ducks and 3000 to 5000 geese.
2. Maintain hunter success rate at 1.1 to 1.3 waterfowl per day.
3. Provide 30,000 to 40,000 hunter days per year.

Species-Specific Strategies

1. Develop standardized surveys to inventory breeding populations and evaluate existing habitat.
2. Estimate population sizes and/or trends, species and subspecies composition, sex and age composition, and geographic distribution, through aerial and ground surveys, hunter check stations, banding, marking, and mailed questionnaires.

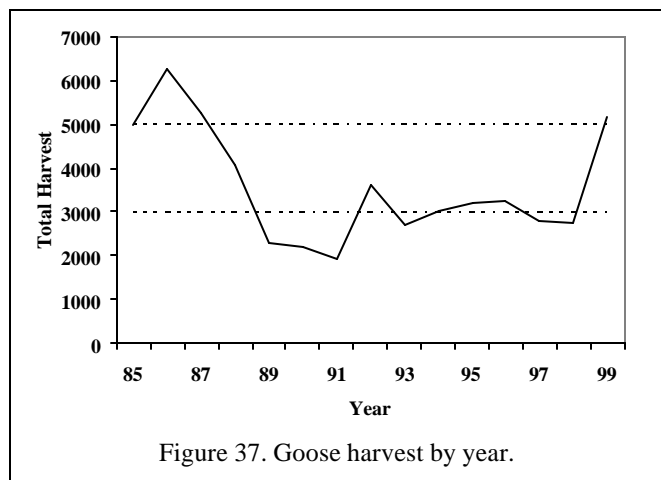
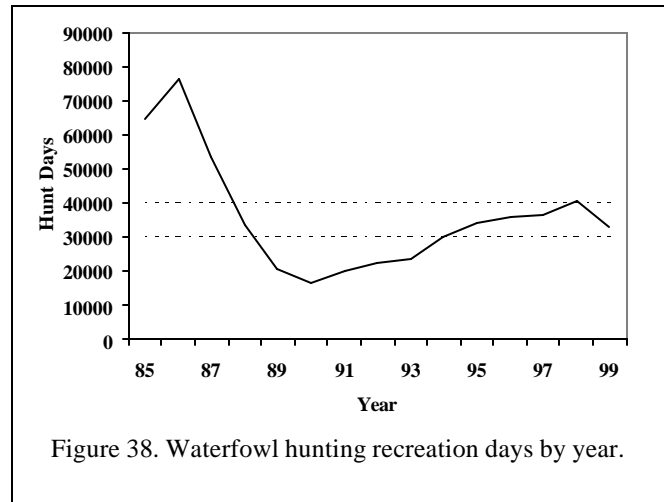


Figure 37. Goose harvest by year.

3. Participate in development of migratory game bird hunt frameworks through the Pacific Flyway Study Committee, Council, and subcommittees thereof; provide equitable hunting opportunity for residents of all areas of the State within those frameworks.
4. Determine methods to minimize waterfowl disturbances caused by activities of other resource users.
5. Develop and implement projects to enhance waterfowl viewing opportunities.
6. Develop and implement projects to enhance waterfowl populations by habitat manipulations and purchase.
7. Coordinate with land management agencies to ensure that livestock grazing in waterfowl habitats is within allowable use guidelines that provide waterfowl with adequate food and cover.
8. Inventory significant waterfowl habitat statewide.
9. Continue to partner with organizations to develop funding for waterfowl habitat projects.



Snipe, Coot, and Common Moorhen

Status and Use

Snipe, coots, and common moorhens are locally abundant throughout Arizona as migrating, wintering, or breeding birds. Populations may fluctuate slightly due to the amount of available nesting habitat both within and outside Arizona. Numbers may vary depending upon severity of winters in northern states and habitat conditions in Arizona, but overall no reductions in populations are anticipated over the next six years.

The demand for snipe, coots, and common moorhens is expected to remain low during the planning period. Coots and common moorhens readily use urban wet areas, thus they are highly visible to the public. In some waterfowl management areas, in northern Arizona, coots may compete with various ducks for nest sites. In these instances, removal of some coots may become necessary.

Goal

Maintain current distribution and abundance of the snipe, coot, and common moorhen and their habitat, while preventing severe competition for nesting sites with other waterfowl species within Arizona.

Objective

1. Develop and provide public information about coot, common moorhen, and snipe.

Species-Specific Strategies

1. Maintain existing hunting opportunities.
2. Participate in development of migratory game bird hunt frameworks through the Pacific Flyway Study Committee, Council, and subcommittees thereof; provide equitable hunting opportunity for residents of all areas of the State within those frameworks.
3. Develop and implement projects to enhance viewing opportunities.
4. Develop and implement projects to enhance populations by habitat manipulation and habitat purchase.

Sandhill Crane

Status and Use

Three subspecies of sandhill cranes winter in Arizona. Current wintering populations of sandhill cranes include 500 to 1000 at Cibola National Wildlife Refuge, 800 to 1000 on the Colorado River Indian Reservation along the Lower Colorado River, 50 to 250 along the Gila River between Buckeye and Gila Bend, and 15,000 to 20,000 in the Sulphur Springs Valley of southeastern Arizona. In 1999, 113 sandhill cranes were harvested, providing 518 days of hunting recreation.

Goal

Maintain or enhance distribution and abundance of sandhill cranes and their habitat.

Objectives

1. Maintain annual harvest at 100 to 200 sandhill cranes.
2. Maintain hunter effort rate at 0.3 to 0.5 cranes per day.
3. Provide 300 to 600 crane hunter days per year.

Species-Specific Strategies

1. Conduct annual surveys to determine wintering numbers, recruitment rates, and subspecies composition.
2. Manage the Willcox Playa Wildlife Area and the Whitewater Draw Wildlife Area primarily for sandhill cranes.
3. Use annual survey information to determine the potential for expansion of hunting opportunities.
4. Expand viewing opportunities to other areas.

Non-native³ Game Birds: Valley Quail, Chukar, and Pheasant

Status and Use

The Department released several species of non-native game birds in the 1950s and 1960s. Three established wild populations: chukar, pheasant, and valley quail. The Department allows take of these birds on a statewide basis, even though the wild populations are limited to a few areas in the State, because these species are also released by operators of shooting preserves and during field trials in areas where wild populations do not occur.

Goal

Manage non-native game birds to enhance their habitats and abundance. Where possible, additional species of non-native game birds may be introduced. For existing and new populations, the goal is to enhance abundance and habitat of non-native game birds where they do not impact native wildlife populations, and when the effort required does not reduce budgets or personnel available for management of native wildlife.

Objective

1. Develop and provide public information about non-native game birds.

Species-Specific Strategies

1. Maintain and enhance existing hunting opportunities.

³ The term “non-native” is used herein to mean the species is not native to Arizona. Some non-native species are native elsewhere in the United States, and some are not native to this continent.

Furbearing and Predatory Mammals

Status and Use

Sixteen Arizona mammals are classified as furbearers and/or predators. Furbearers are badger, beaver, bobcat, muskrat, otter, raccoon, ringtail cat, and weasel. Predators are bobcat, coyote, red fox, gray fox, kit fox, and striped, spotted, hooded, and hog-nosed skunks.

Six predators/furbearers are hunted: coyote, foxes (3 species), bobcat, and raccoons. The remaining ten species are primarily nocturnal, and are not normally available to hunters. Trapping has been the principal means of harvesting the nocturnal species. In recent years, pelt prices for most furbearers have declined dramatically, with resultant decreases in annual harvests. Passage of State law in 1994 prohibiting trapping on State, federal, and other public lands further reduced statewide harvest.

The coyote is common in all habitat types in Arizona. In 1999, 58 trappers took 1100 coyotes, while 14,500 hunters harvested 45,600 (Figs. 39, 40).

Bobcats occur statewide, but are most common in rugged broken country within Sonoran Desertscrub and Interior Chaparral. In 1999, 58 trappers took 140 bobcats, while 14,500 hunters harvested 1460 (Figs. 39, 41).

Three species of foxes inhabit Arizona: red foxes in the northeast; kit foxes statewide (in areas of fine grained soil); and gray foxes statewide (in rocky habitats). In 1999, 58 trappers took 470 foxes, while 14,500 hunters harvested 4900 (Figs. 39, 42).

Goal

Maintain the historical range and distribution of furbearers and predatory mammals in Arizona. Allow for maximum recreational, economic, and aesthetic uses commensurate with existing populations.

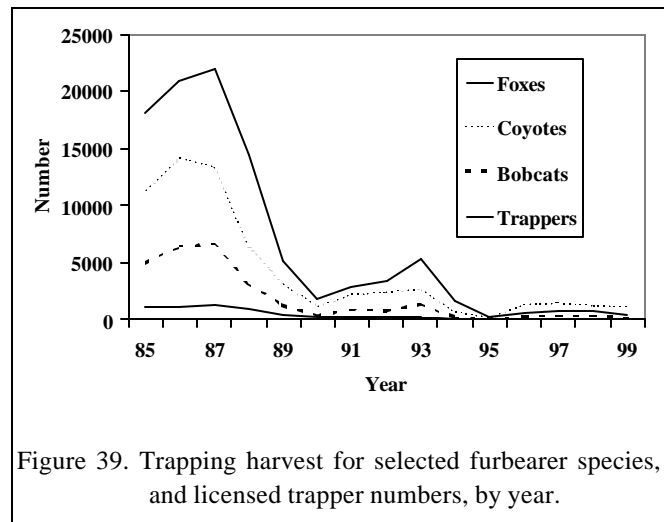


Figure 39. Trapping harvest for selected furbearer species, and licensed trapper numbers, by year.

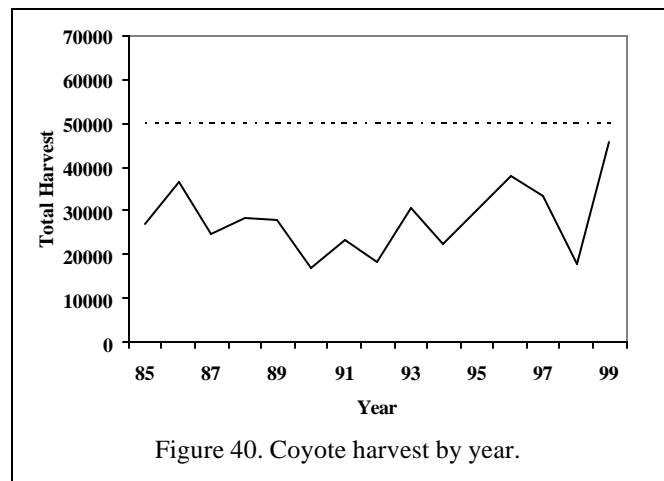
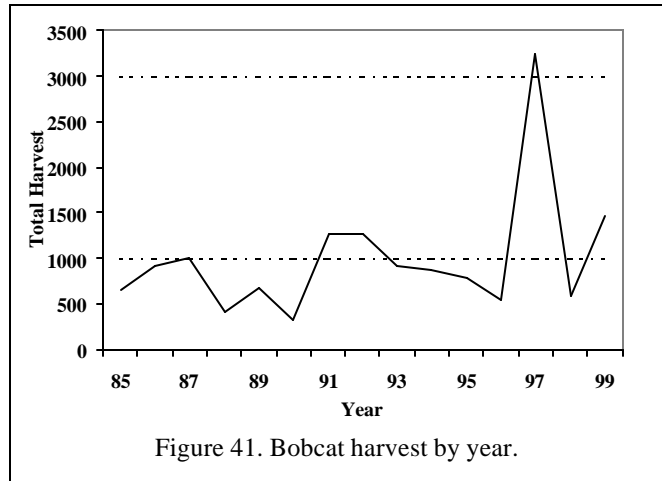


Figure 40. Coyote harvest by year.

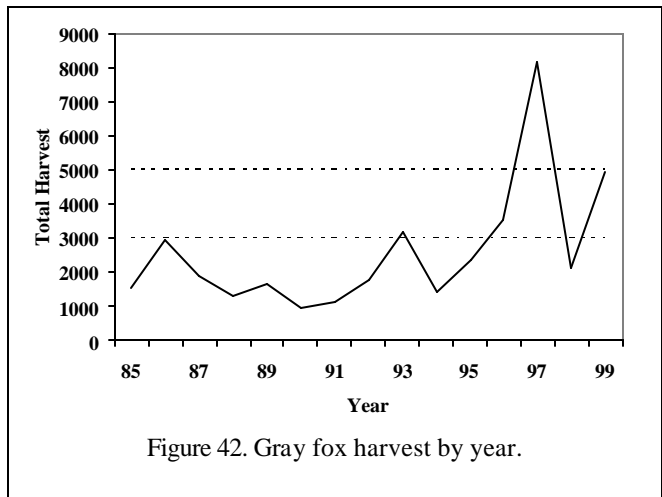
Objectives

1. Provide opportunity for 50,000 hunter days per year, across all species of predators and furbearers.
2. Maintain trapping as a recreational opportunity on private property, in accordance with A.R.S. 17-301d.
3. Develop and provide public information about furbearing and predatory mammals and their management.
4. Bobcat: maintain annual harvest at 1000 to 3000 bobcats.
5. Coyote: encourage annual harvest levels of up to 50,000 coyotes.
6. Foxes: maintain annual harvest at 3000 to 5000 foxes (all species combined).
7. Evaluate the effectiveness of any activity targeted at limiting furbearer or predator numbers.



Species-Specific Strategies

1. Encourage the public to respond to depredation situations, within the limits established by A.R.S. 17-239.
2. Continue to obtain estimates of hunter harvest of predators and furbearers.
3. Maintain adequate suitable habitat for predators and furbearers.
4. Through surveys and research, develop information regarding range, distribution, population levels, and harvest opportunities for predators and furbearers.
5. Reintroduce aquatic furbearers into suitable habitat.
6. Implement the Department's Predation Management Policy.



Sportfish Management Subprogram

This plan is based on the fact that Arizona anglers are a diverse and varied lot, and their desires for sportfishing opportunities are equally varied. It is the role of the Department's sportfish management subprogram to identify the needs and desires of these anglers, provide for the quality experiences they expect, and ensure that all the resources held in trust for them are conserved. This plan works toward achieving the Department's mission by providing direction to Arizona's sportfish managers through goals, objectives, and strategies.

The vast array of fishes that Arizona anglers enjoy today is the result of more than a century of introductions made to provide fishing opportunity. Few people realize the fish sought by Arizona anglers today are, like many of themselves, transplants from elsewhere. These are valuable resources that generate millions of hours of enjoyment and learning for Arizona citizens and our visitors, and millions of dollars to our State's economy. Equally valuable are the native fisheries resources which are less frequently pursued as sport fishes. Hence, our subprogram goals and objectives have evolved to recognize the importance of providing for both resources.

Since the Department was established in 1929, a variety of State and federal laws and regulations have been enacted to manage and protect Arizona's fisheries resources - both sport and native. These laws and regulations have been essential to maintaining and managing the State's limited sportfisheries and conserving and recovering the State's rare native fishes.

Of all the Department's roles and programs, carrying out the Sportfish Management Subprogram may be among the most recognizable by Arizona's citizens. A 1998 survey of the general public revealed that more than two-thirds of those contacted recognized the role of the Department in enforcing fishing laws and conducting fisheries management. Of all Department programs evaluated in that survey, more respondents rated Sportfish management as excellent than any other program (18%).

The Arizona Angler

Angling is a major recreational pastime among Arizonans. In 1999, more than 350,000 Arizona residents and 35,000 non-residents purchased Arizona fishing licenses (Fig. 43). Total license sales have rebounded to near the peak sales of 1986, and the estimated number of days fished in Arizona has continually fluctuated around an annual average of about 7 million angler-days. The average number of days that resident anglers spend pursuing their fishing passion has remained steady during the past five years, near 22 days per year.

Not all of Arizona's anglers are licensed in any given year. It is important to note that anglers younger than 14 years of age do not require licenses, and individuals who qualify are issued complimentary licenses. Beyond that, not everyone gets the opportunity to exercise their desire to fish in every year, and may not be a license purchaser. In *Wildlife and the American Mind* (1998. Responsive Management, Harrisonburg VA), Duda and others called the annual national count of anglers the tip of the iceberg, reporting that there is a large market of anglers who have fished in the past and, given the right conditions, will fish again in the future.

Evidence from our Department's 1998 survey (biennial *Trend Survey*) of the public suggests that as many as 26 percent of the Arizona population fished this year, but 33 percent considered themselves anglers. Duda and others (1998) suggest that as many as 80 percent of Americans have fished at some point in their lives. That suggests that we have a very large actual audience, and an extremely large potential audience for our Sportfish management subprogram.

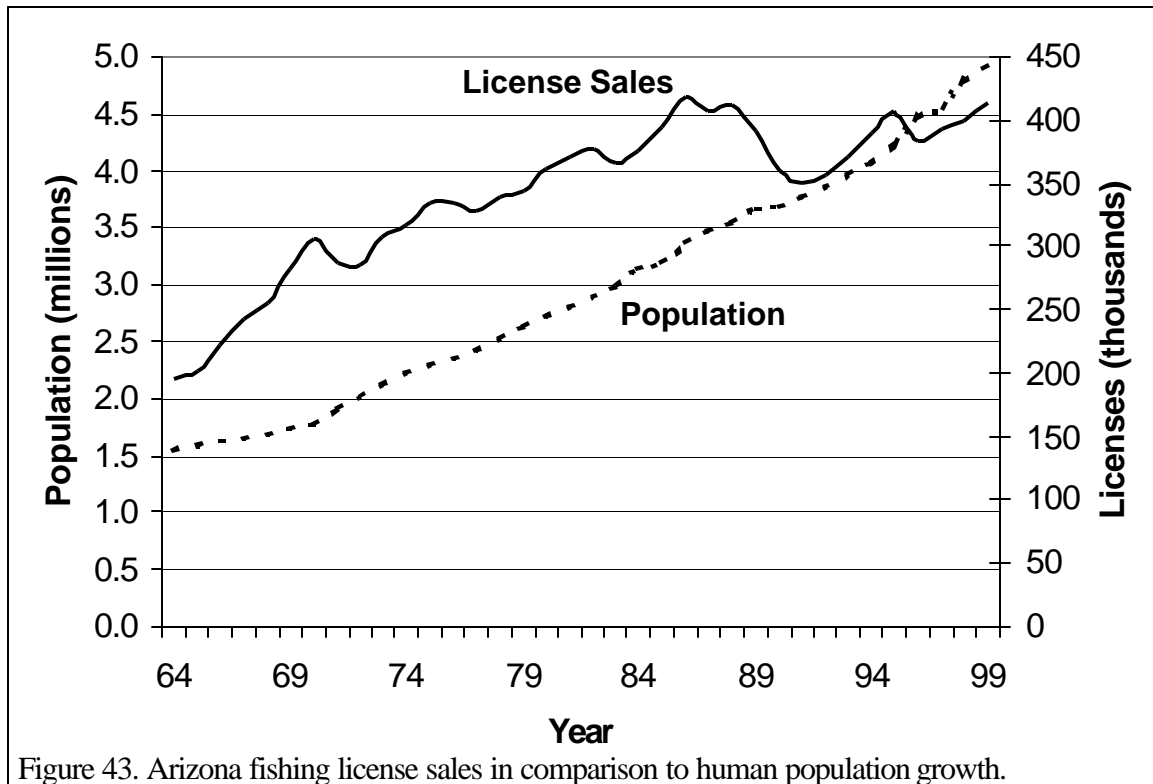


Figure 43. Arizona fishing license sales in comparison to human population growth.

In 1996 and 1998 (Department biennial *Trend Survey*), the general public was surveyed and asked to rate fisheries management in Arizona. In both surveys, more than 60 percent told us they were satisfied to very satisfied with the Department's fish management performance.

In 2000, we specifically asked anglers (Department's *Angler Survey*) to rate their fishing satisfaction. Of the anglers responding:

- 76 percent reported their satisfaction as acceptable to excellent⁴
- 77 percent evaluated their satisfaction with angling facilities as acceptable to excellent
- 71 percent evaluated their satisfaction with the management of their sportfisheries resources as acceptable to excellent
- 87 percent evaluated their satisfaction with the Department's outreach efforts regarding sportfisheries as acceptable to excellent

⁴ Ratings of 5 to 10 on a 10-point scale.

The Sportfish Management Subprogram is focused on inviting the public to participate in sportfishing, and conserving these resources to ensure that they are available now and in the future. Reasons for dissatisfaction with sportfishing in Arizona and choosing not to participate are not necessarily related, but are equally important. The most frequent reasons given for dissatisfaction with their sportfishing experience is "not catching enough fish" (63% of those expressing dissatisfaction), followed by "poor condition of fish" (13% of those expressing dissatisfaction).

To improve satisfaction, we must continue to concentrate on the quality of fishing experiences, the quality of our products, and our outreach to anglers to help them get the most out of their experiences. The most frequent reasons given for not being an angler were "lack of interest" (38% of those who said they didn't fish) and "lack of time" (29% of those who said they didn't fish). To continue to improve participation, we must continue to concentrate on outreach to the uninitiated or former angler to inform them of the opportunities that are available to them and to help them develop the skills to start fishing.

The typical Arizona angler is difficult to portray, and it is perhaps dangerous to try to pigeonhole them. The odds are that they began fishing as youngsters. Research suggests that anglers that begin fishing early in life continue to fish throughout their lives (Duda and others 1998). This suggests that our youngest anglers in Arizona, even though they are poorly counted, are a very important part of our angling public. While most of our anglers are males between the ages of 18 and 54, sportfishing can and should be targeted at the broadest possible range of Arizonans.

Arizona's anglers run the gamut from generalist anglers to specialists. Research by the Department indicated that nearly 60 percent of our anglers are "occasional" or "generalist" anglers, 40 percent consider themselves "species specialists" or "advanced species specialists." The specialist angler tends to invest more in the sport, spend more time at their sport (13 to more than 30 days per year), and are more likely to be affiliated with other anglers in clubs or organizations. Approximately 11 percent of the licensed anglers responding to the 1992 survey belonged to a fishing club or organization.

Arizona anglers may fish for more than one species, and sometimes at the same time. Enactment of a two-pole stamp in 1992 is helping them do so. However, about 12 percent of Arizona's anglers fish solely for trout, and four percent fish only for largemouth bass. We estimate that almost 2.5 million of the 7.8 million fishing days in Arizona were spent in pursuit of trout. In decreasing order of preference, trout, largemouth bass, crappie, striped bass, and channel catfish are the State's most sought after species. The popularity of trout is confirmed by the fact that 71 percent of the 1999 license holders purchased trout stamps.

According to our surveys of Arizona's anglers, large inland reservoirs close to Phoenix, such as Roosevelt Lake, receive the most angling use in Arizona, followed by small mountain lakes, and the larger Colorado River reservoirs.

Catching fish is undoubtedly an important criterion for satisfaction with the angling experience, but it may not be the only determining factor. Anglers who expressed dissatisfaction with their angling experience most frequently said it was because "not enough fish [were] caught"(63%).

Other reasons included "poor fish condition" (13%), "crowded fishing locations" (11%), and remoteness of fishing locations (9%) (AGFD 1998 biennial *Trend Survey*).

Catching fish is important, but it is not the only factor. Duda and others (1998) listed the main reasons that people gave for fishing; which included: "to relax" (33%), "being with family and friends" (25%), and "for the sport" (18%). Catching fish and catching large fish were fourth and sixth on the list of main reasons, representing 13 and 3 percent of the responses. Being able to keep the fish that are caught may not determine satisfaction, either. When asked if they needed to keep a fish to have a satisfying trip, 46 percent of responding Arizona anglers said no. This percentage represents all Arizona anglers, but most who responded this way fished only for trout.

The most recent information the Department has on angler attitudes with regard to balancing sportfish-native fish values is from our *1992 Angler Survey*, which posed several important questions regarding fisheries management. When anglers were asked if Arizona's native fish should be managed as sportfish, 31 percent agreed, 22 percent disagreed, and 47 percent were unsure or had no opinion. However, when asked about sportfish management versus native fish management, 37 percent of the responding anglers said sportfish management should not be disrupted to protect native fish populations, but 26 percent said we should do everything we can to preserve Arizona's native fish populations. About 37 percent were unsure or had no opinion.

The latter response, regarding sportfish-native fish conflicts, indicates that some Arizona anglers disagree with the general public. The Department's *1992 Arizona Trend Survey* of the general public showed that 65 percent of all Arizonans believe we should do everything we can to preserve native fish, 22 percent responded that sportfish management should not be disrupted, and 13 percent were unsure or had no opinion. Although these questions have not been posed to anglers or the public since 1992, we have no reason to believe that those opinions have shifted. Nonetheless, we recognize that both resources must be managed as public trusts, and in complementary fashion.

Arizona anglers make a significant contribution to local economies and to the State's economy. Anglers spent about \$358 million in 1996 in Arizona, generating an overall economic impact to the State of nearly \$663 million. The median expenditure per fishing day was \$50.

Current Supply

Arizona has 159 stream management reaches that are managed primarily for trout. They have a combined length of 1470 miles. Four other stream reaches, totaling 34 miles, are managed primarily for warmwater species and secondarily for trout.

Presently, 64 lakes, comprising approximately 3000 acres, are managed primarily for trout. Ten other lakes managed primarily for warmwater fish also provide trout fishing opportunities, on approximately 30,000 acres.

Most trout harvested in Arizona are stocked as catchables, or as fingerlings that grow to harvestable size. Wild-spawned trout comprise a small percentage of the total harvest. In most Arizona coldwater streams, natural trout production is dependable but insufficient to meet angling needs. Trout do not reproduce in Arizona lakes.

Trout are managed under one of six concepts: Intensive Use, Basic Yield, Blue Ribbon, Wildfish, Featured Species, or Urban. Concepts are matched to specific fisheries to accommodate biological and social demands.

The Department manages about 354,800 acres of impounded water (lakes, reservoirs, ponds, and tanks) and 35,840 acres of flowing water (about 1400 linear miles) for warmwater species. Management of these waters is based on biology, angler use, partnership commitments and needs, and social demands. Some waters have largemouth bass size limits, but most have liberal regulations to encourage angler use and harvest.

Only a few of the waters managed by the Department are owned or controlled by the State of Arizona. In Arizona, water storage projects often conflict with the objectives of fisheries management, since their primary purposes are for irrigation, hydroelectric power, flood control, and municipal uses. Sportfishing is, at best, secondary to these purposes.

Current Demand

Approximately 23 species of sportfish are sought by Arizona anglers (Table 2). Some species are heavily used, but others are under-used or ignored. In 1999, the Department licensed more than 350,000 resident and 35,000 non-resident anglers. Licensed resident anglers spent more than 7.8 million angler days on all waters in Arizona, including 2.49 million days on coldwater and 5.2 million days for warmwater. Proximity of waters to the angler is of major importance. Not surprisingly, nearly half the warmwater fishing recreational days spent by Arizona residents were spent on large inland reservoirs.

Table 2. Sportfish found in Arizona.

Largemouth bass	Flathead catfish
Smallmouth bass	Bluegill
Striped bass	Redear sunfish
White bass	Yellow bass
Brown trout	Bullhead catfish
Rainbow trout	Yellow perch
Cutthroat trout	Walleye
Apache trout	Northern pike
Grayling	Carp
Crappie	Buffalofish
Channel catfish	Tilapia

Future Supply

The number of trout available to anglers will be maintained over the next six years, due to several factors. The hatchery renovation program has been completed, and production levels have stabilized. The supply of wild trout (including native Apache and Gila trout) may also increase as coordinated habitat projects improve watershed, riparian, and instream habitat. More anglers today understand and practice "catch-and-release," and trout that would otherwise have been removed from the fishery are returned to be caught more than once.

Angler use can be increased through improved access to waters currently unavailable to or under-used by warmwater anglers. Through negotiation and partnership agreements, angler access may be secured to irrigation projects, municipal and urban lakes, and reservoir banks generally difficult for the shore angler to access. City lakes may be more intensively managed in cooperation with municipal governments to provide more fishing opportunity in proximity to urban population centers through our aggressive Urban Fishing Program.

Future Demand

Future demand for Arizona sportfishing was estimated from projected statewide population growth and angler use estimates. User days appear to have been rather stable during the last 5 years. License sales have rebounded, after falling off during the relatively dryer years since 1986. Unlike the sale of trout fishing licenses (trout stamps and Class F fishing licenses), the sale of warmwater fishing licenses (Class A and Class F licenses) has kept pace with Arizona's growing population. We estimate a continuing resident demand of 5.4 million warmwater and 2.6 million coldwater user days will need to be accommodated through 2006. No growth is anticipated in nonresident demand.

There is no indication from current license sales that angler use for most warmwater fisheries will be saturated by 2006. However, access limitations suggest that boating capacities on Arizona's inland reservoirs and the Colorado River will continue to be a challenge for this planning period. Problems with limited access and competing recreational users are beginning to be reflected as angler dissatisfaction.

Mission, Goals, and Objectives

Mission: Maintain, manage, and enhance (when appropriate and economically feasible) the quality, abundance, availability, and diversity of sportfishing opportunities; and disseminate information about Arizona's sportfish and sportfishing opportunities for present and future generations.

Goals:

1. Maintain, manage, and enhance the quality, abundance, availability, and diversity of sportfishing opportunities while contributing to the recovery of Arizona's native fishes.
2. Develop integrated, watershed-based fisheries management approaches for watersheds in Arizona and identify reaches or zones for management of sportfishes and native fishes.
3. Increase public awareness of Arizona's sportfishing resources and opportunities.

Objectives:

1. Annually, provide sportfishing opportunities to accommodate 2.6 million coldwater and 5.4 million warmwater angler days through the year 2006.
2. Achieve a 60 percent satisfaction rating among Arizona's angling public (i.e. 60% of Arizona's anglers indicating they were satisfied with their angling experience over the past year).
3. Develop watershed-based management approaches for at least two watersheds in Arizona by the year 2006.
4. Provide Arizona's diverse publics with information about fish and fishing, to maintain and enhance awareness of their opportunities to use and enjoy Arizona's fisheries resources.

Strategies

1. Investigate size limits, bag limits, and closed season regulations and implement or modify where necessary.
2. Develop watershed-based fisheries management plans that identify where sportfish and native fish will be managed, and structure management programs to minimize conflict between these two resource groups.
3. Increase Department efforts to develop and distribute information and educational material explaining fishing opportunities and techniques for catching under-used species.
4. Evaluate and improve angler access through road development, trail development, fishing pier and boat ramp construction, and physically-challenged access.
5. Examine existing fisheries habitat and develop and implement habitat improvement plans.
6. Work with regulating agencies to manage water level fluctuations to increase benefits to sport and native fisheries, such as by establishing minimum pools and minimum flows.
7. Continue to reintroduce warmwater and coldwater native sportfish into previously occupied habitats.

8. Continue to accumulate data on levels of toxic substances in fish to evaluate and respond to human and environmental health concerns.
9. Develop an "adopt a stream" program, in which citizens volunteer to help the Department monitor and protect aquatic riparian resources.
10. Continue the weed harvester program to improve access and water quality.
11. Investigate lake aeration programs to reduce seasonal fish kills.
12. Continue fishing clinic programs to teach people how to fish, with emphasis on females, youths, and other under-represented groups.
13. Continue to update information and education displays at hatcheries, Department offices, and our State Fair building.
14. Remove undesirable non-native fishes from waters in which they pose management problems.
15. Evaluate angler demands and satisfaction through behavioral and economic surveys of the angling and non-angling public.
16. Determine the proportion of Arizona anglers who support "catch-and-release" versus "catch-and-kill."
17. Select pilot waters in which to stock trout larger than 13 inches, and evaluate angler response and cost effectiveness.
18. Develop additional sportfisheries in or near urban areas.
19. Evaluate one-day license use on the Colorado River.
20. Investigate changes in watercraft motor restrictions on trout lakes.
21. Investigate liberalizing requirements for a Pioneer License.
22. Continue to improve the quality of trout stocked.
23. Promote catch-and-release fishing as a viable angling technique, and apply catch-and-release fishing where it is consistent with the resource management strategy for a body of water, habitat capability, and the desires of the angling public.
24. Use wildlife law enforcement patrols to monitor, measure, and ensure compliance with fishing regulations, including directing high-profile enforcement outreach to bolster compliance with fishing regulations.
25. Enhance some waters currently managed for non-native trout to develop additional Blue Ribbon fishing opportunities for rainbow and potentially for brown trout (where they currently exist).
26. Work with partners to develop and implement protocols and surveys for diseases and pathogens in native and wild populations of sportfishes.
27. Develop and implement stream-side incubators (e.g. Whitlock-Vibert boxes) and any other on-site mechanisms, equipment, or technology as supplements to hatcheries in working toward recovery of Arizona's native Apache trout and Gila trout, and management of any other species for which they can be used effectively.
28. Develop and implement mechanisms to resolve the Parker Canyon Lake fishery problem resulting from unlawful introduction of northern pike.

Nongame and Endangered Wildlife Management Subprogram

Strategic plans and the constraints under which they are developed are more easily understood when the reader is familiar with the language used in them. For the purposes of *Wildlife 2006*:

"Nongame wildlife" means wildlife (including native fishes) that is not hunted, trapped, or fished in a traditional sense. This practical, if imperfect, definition reflects prevailing public perception. In reality, many species that are legally defined in Arizona as nongame wildlife are legally hunted (e.g. some rattlesnakes), trapped (e.g. coatimundis), or taken by anglers (e.g. native suckers).

"Endangered wildlife" means any crustacean, mollusk, fish, amphibian, reptile, bird, or mammal that is listed by the Department as a species of *Wildlife of Special Concern in Arizona*, or by the U.S. Fish and Wildlife Service as endangered or threatened, or which is a candidate for such status. Some "endangered species" are legally defined in Arizona as game species (e.g. masked bobwhite, Sonoran pronghorn), and one "threatened species" (Apache trout) is lawfully taken for sport purposes.

Current Supply

Relatively few native species or subspecies of wildlife have been extirpated from Arizona since pre-settlement days. Even fewer have become extinct. In fact, most native species in Arizona are still abundant and offer tremendous recreational opportunities, whether through harvest or observation. Others are not abundant, and some are increasingly threatened by habitat degradation. Some populations have diminished to the point at which entire species may soon be lost from the State. Some species or subspecies are even in jeopardy of extinction, an increasing global problem.

Arizona's richest wildlife habitat, riparian (streamside) habitat, is very different today than it was historically. Much of the lowland riparian habitat that was here a century ago has been destroyed, degraded, severely fragmented, or otherwise substantially altered. Upland portions of watersheds have been degraded, exacerbating impacts at lower elevations, especially on streams, rivers, and riparian habitats and making their restoration more difficult. Governor Rose Mofford issued Executive Order No. 89-16, on June 10, 1989, to direct State agencies to work toward restoration of riparian resources. The order also established an interdisciplinary Task Force to make conservation recommendations for these habitats. Later some of these functions were assumed by the Riparian Area Advisory Committee that was established in the Arizona Riparian Conservation Act of 1992. Conservation attention remains focused on riparian habitats as this Strategic Plan is being written, because those habitats are essential to so many species of wildlife. As their habitats dwindle, or recover, so do their populations. Restoration of upland portions of watersheds will be crucial to success.

The Department maintains an annotated list of *Wildlife of Special Concern in Arizona*. The list, available from the Department's Nongame Branch, includes native mollusks, crustaceans, fishes, amphibians, reptiles, birds, and mammals that are extinct, extirpated, or which have relatively small populations that are often greatly reduced from historic levels. These species often occur in

habitats that are similarly reduced and which are usually threatened by further losses. Wildlife problems cannot be separated from habitat problems.

Crustaceans and Mollusks

Very little is known about Arizona's native crustaceans and mollusks. Although many species are apparently endemic to Arizona (found nowhere else), in comparison to other groups of wildlife they receive virtually no management attention. Taxonomic recognition and locality of discovery are often all that is known about them. Most occur in isolated springs, or other waters that have not been developed. Several species occur in or very near waters important to the Department or other land or resource management agencies, such as spring or stream-fed fish hatcheries.

One mollusk, the Kanab ambersnail, is federally listed as endangered. It occurs in the Grand Canyon, and at another site in Utah. Another species, the Wet Canyon talussnail, which is restricted to southeastern Arizona's Mount Graham, is protected by a Conservation Agreement between the Department, U.S. Forest Service, and U.S. Fish and Wildlife Service. Another mollusk, the San Xavier talussnail, which occupies a site in the Mineral Hills (near Tucson), is also protected by a Conservation Agreement between the Department; Arizona Electric Power Cooperative, Inc.; El Paso Natural Gas Company; and the U.S. Fish and Wildlife Service.

Conservation Agreements are a relatively new concept. They are intended to meet a species' conservation needs before it becomes imperiled, perhaps obviating the need to list the species federally as endangered or threatened. State wildlife agencies are working with their partners to develop a variety of such agreements, and to improve their effectiveness by refining how they are structured and implemented. To date, most Conservation Agreements have been focused on species that had already been identified as candidates for federal listing. However, the Department is also striving to develop agreements for species that are not yet candidates for listing, and to provide state leadership for these proactive conservation efforts. The need for such action is obvious, as many Arizona crustaceans and mollusks appear to be likely candidates for federal listing as threatened or endangered.

Native Fish

The 32 native fishes of Arizona include 30 freshwater and 2 saltwater species. They range from inch-long topminnows to North America's largest minnow, the 6-foot long, 80-pound Colorado pikeminnow (squawfish). Twenty-seven of the native freshwater species still occur within their historic ranges in Arizona. Of the other three, the Monkey Springs pupfish is extinct, and the Yaqui catfish and Yaqui sucker no longer occur in Arizona, but still do in Mexico. Occurrences of the two native saltwater species, machete and striped mullet, now vary with flows of the lower Colorado River, as dams, water management, and floods permit.

Because of human-induced habitat changes, most native fish now occupy a small portion of their former ranges, if they are present at all. Most species are listed by the Department as *Wildlife of Special Concern in Arizona*, and many are listed by the U.S. Fish and Wildlife Service as threatened or endangered. Several species, such as the bonytail chub, Colorado pikeminnow, and razorback sucker, have very small or senescent populations, or both, that must be supplemented

through stocking programs to prevent them from being extirpated. For other species, such as several species in the Yaqui River drainage, extirpation has already occurred but reintroduction may restore them to Arizona's landscape.

Although native fish still occur in most river drainages in Arizona, few streams support fish communities that have no non-native species. Communities of as many as ten native species probably occurred historically at several sites in the Gila River Basin. Today, the single richest site known is Aravaipa Creek, which still supports seven kinds of native fish in the virtual absence of non-native species. The next largest purely native fish faunas are in a few streams that support five species. Streams with even four native species are rare and rapidly becoming even more so, especially those that have only native species.

Amphibians and Reptiles

Many Arizona amphibians and reptiles are abundant and seasonally conspicuous, especially the desert-dwelling species. Among them are such commonly encountered species as spadefoot toads; whiptail, side-blotched, tree, and desert spiny lizards; gopher and king snakes; and diamondback and Mohave rattlesnakes. Two non-native species, the bullfrog and softshell turtle, have become widespread and locally abundant. Both were introduced for food and sport.

The distribution and status of many of the rest of Arizona's 26 species of native amphibians and 103 species of native reptiles is not well known. Management decisions for most species must therefore be based on suspected distribution and abundance. Population and trend data are sorely needed to determine the status of these species.

Populations of some species of amphibians and reptiles are smaller and/or more threatened than they were historically. Twenty are now listed as *Wildlife of Special Concern in Arizona*. One species, the relict leopard frog, was for several years thought to be extinct, but, through persistent survey efforts (including in Arizona), was recently rediscovered in Nevada. Another, the Tarahumara frog, was extirpated from Arizona in 1983 but still survives in Mexico.

Two species of reptiles in Arizona are listed by the U.S. Fish and Wildlife Service as threatened. The Mohave Desert population of the desert tortoise was federally listed in April 1991. The New Mexican ridge-nosed rattlesnake was federally listed in August 1978, although it was not discovered in Arizona until 1996.

One Arizona amphibian, the Sonoran tiger salamander, is federally listed as endangered. Another, the Chiricahua leopard frog, has been proposed for federal listing.

Two amphibians and reptiles are protected by Conservation Agreements between the Department and various partners: flat-tailed horned lizard and Ramsey Canyon leopard frog. Conservation Agreements may also be developed in the near future for the Chiricahua leopard frog, Tarahumara frog, and Sonoyta mud turtle.

Nongame Birds

The list of birds documented as native to Arizona now stands at slightly more than 500 species. Roughly 450 are considered nongame species, and about 291 have been documented as breeding in the State. At least five non-native species have also become established here, through the actions of humans. Some, such as house sparrows, starlings, and rock doves (pigeons), have been here for so long and are so common that many people also think of them as natives.

Arizona's bird life includes many species that breed or winter elsewhere. Their numbers here thus reflect habitat availability on their distant wintering or summering grounds, as well as what they encounter during the rigorous test of twice-annual migrations. Arizona's neotropical migrants, which breed in the United States and/or Canada and winter to the south, from Mexico to South America, total 237 species, of which 163 nest here regularly or irregularly. Research across the United States suggests that populations of many of these species are declining, due to loss or alteration of habitat, cowbird nest parasitism, and predation. Two species of neotropical migrants, the southwestern willow flycatcher and Yuma clapper rail, are federally listed as endangered. The brown pelican, whooping crane, wood stork, and masked bobwhite are also federally listed as endangered.

Thus far, 42 species of birds of prey (raptors) have been documented in Arizona. Dubious records also exist for three other species: the swallow-tailed kite, short-tailed hawk, and snowy owl. Thirty-four of the 42 raptors occur year-round, or breed here. Five species are federally-listed as threatened or endangered; 13 are on the Department's draft list of *Wildlife of Special Concern in Arizona*. Two species have been extirpated: the aplomado falcon, and the California condor (which is now being reintroduced in northern Arizona). Conversely, two others are recent, natural arrivals: the white-tailed kite and the Mississippi kite.

The greatest variety of species, and often numbers, of nongame birds in Arizona occurs in lowland riparian forest and woodland in the southern third of the State. However, these habitats declined so severely in the 1800s and 1900s that the species occupying them comprise more than half the 29 non-raptorial birds listed as *Wildlife of Special Concern in Arizona*. Many raptors listed as *Wildlife of Special Concern in Arizona* are also closely tied to riparian habitats for foraging or nest sites.

Nongame Mammals

Arizona has a diverse, abundant mammalian fauna. It includes many nongame species and a rich variety of game species. Each part of the State harbors at least one kind of mammal unusual enough to be a delightful surprise when encountered in the field. The known distribution and taxonomy of the 134 species of mammals native to Arizona, and of the 11 species introduced successfully here, are well summarized by D.F. Hoffmeister in *Mammals of Arizona* (1986. The University of Arizona Press, Tucson AZ).

From almost any perspective, many nongame mammals in Arizona are poorly known. Entire species complexes, such as the voles, gophers, and several genera of mice have yet to be definitely analyzed with modern biochemical taxonomic techniques. The ecology and

distribution of some of these species, and many other small mammals, is also poorly known. Among those in need of field study are the water shrew, jumping mouse, and several species of pocket mice.

Twenty-seven Arizona mammals are listed as *Wildlife of Special Concern in Arizona*. Nine are also federally listed as endangered. Three of these forms are extinct, and five have been extirpated from the State, although reintroduction efforts are underway for two (black-footed ferret and Mexican wolf). Most other imperiled species have very small, local populations that face a variety of threats. Some species are tied to riparian or native grassland communities.

Current Demand

Arizonans enjoy wildlife. Some harvest wildlife, others do not. Traditionally wildlife agencies and the public have treated these "user" groups separately. In reality, there is broad overlap between the two. Many hunters and anglers are wildlife watchers. Many wildlife watchers hunt and fish. And "conservationists" include people from both groups, as well as from many others. Regardless, the impacts of wildlife recreationists on Arizona's wildlife populations have been, and will remain, insignificant in comparison to the impacts of habitat losses to activities unrelated to such recreation.

Wildlife watching, nature photography, and conservation uses predominate with nongame and endangered wildlife. By definition, much of the pleasure for these users comes from looking for or at wildlife, or from just knowing that it exists. Since these activities generally have little direct impact on individual animals, they are usually not monitored by wildlife agencies as closely as hunting and fishing. Most do not require special licenses or permits.

The most conspicuous demand for nongame wildlife is for viewing opportunities. Foremost among the users are resident birdfeeders and birdwatchers. Each year, thousands of nonresidents also search for nongame birds in Arizona, especially rare species that occur nowhere else in the United States. Not surprisingly, guest ranches and a few private nature preserves cater to birdwatchers and other nature enthusiasts. Commercial tours also target Arizona for natural history and birdwatching tours every year. Most of the tours are to southeastern Arizona, but towns throughout the State benefit economically from birdwatchers.

There is also considerable scientific and educational demand for nongame and endangered wildlife. Countless important questions remain to be answered about these species. Native animals have fascinating adaptations to their habitats and to other animals. Some must contend with newly arrived non-native species. This offers unique opportunities for experiments in nature, especially with native fish and amphibians. Their habitats have been used as living laboratories in which to test ecological principles and management theories.

Nongame species have other important values, too, just as game and sportfish do. Most serve as biological barometers of ecosystem health, indicating changes in habitat quality and biological diversity. The conservation of biological diversity has itself become a major concern worldwide. A basic principle of ecology is that biological systems with greater species diversity (more species and larger numbers of individuals per species) are more stable and productive, thus

“healthier.” Species diversity and abundance of Arizona's flora and fauna are thus an indicator of the ability of the State's biological systems to provide us, and our wildlife, with some of our basic life requirements. Additionally, wildlife and plants continue to be sources of countless research discoveries. Potentially, any species might hold the promise of medical, economic, or other material benefits to humans.

The increasing public awareness of Arizona's natural heritage includes an appreciation of the aesthetic values of nongame and endangered wildlife. Many people prize the "existence values" of wildlife, whether game or nongame. They want to know that a species still occurs in nature, regardless of whether they might ever have an opportunity to observe or use it themselves.

Some of these feelings appear to be related to an inherent understanding of the biological barometer concept. Many people just seem to "know" that when waterfowl numbers are high, our wetlands (or Canada's) must also be in good condition. Conversely, they understand that when the number of aquatic organisms considered threatened or endangered is rising, the quality of our waters is probably declining. Protecting these species, and the habitats in which they live, is protecting ourselves and the quality of our lives. Too often we fail to heed the silence of the proverbial “canary in the coal mine.”

Perhaps the most direct demand for consumptive use of nongame wildlife is the pet trade. Although take of Arizona wildlife for commercial purposes is prohibited by law (with a few specific exceptions), licensed individuals may and do lawfully take a variety of nongame species for use as pets. The Department maintains certain Commission Orders that regulate this take. Small mammals (especially some rodents), a variety of amphibians and reptiles, and some raptors are among the species that may be taken for personal possession. Since most of this take is accomplished via an across-the-counter hunting license, without an additional special permit being required, we have little information on how many people are engaged in these activities. However, the numbers seem to be increasing and, within the limits of the wildlife resource and its habitat, the Department facilitates and encourages this use of wildlife. Favorable experience with a wildlife pet early in life is how many people develop a conservation ethic and a sense of appreciation and value for wildlife-oriented recreation.

The demand for live animals, skins, parts and mounted specimens for schools, researchers, nature centers, environmental education centers, and the like also seems to be increasing. Even so, these uses probably do not account for enough harvest of nongame wildlife to affect common species. As with all wildlife, the legal take of nongame species that are of special concern to the Department is rigorously controlled to ensure that populations are not impacted negatively.

Quite likely, more nongame wildlife are killed each year through control measures intended to protect public health and safety, or to eliminate "nuisance" problems, than are taken under auspices of hunting licenses for sport harvest or use as pets. Conflicts that lead to control measures arise most frequently in urban or agricultural settings. Some urbanites do not fully appreciate wild animals, especially big or potentially dangerous ones, as interesting and valued neighbors. More serious urban problems that lead to control measures occur on or near military and public airports, where birds sometimes are collision hazards to aircraft.

Nongame wildlife are also often killed in rural settings, to protect crops, orchards, vineyards, private fish hatcheries, poultry, and livestock. The take in these settings probably far exceeds the urban take described above. Arizona Game and Fish regulates this take through special licenses issued to the U.S. Department of Agriculture's Animal Damage Control program and to Wildlife Service Permittees (licensed Pest Control Operators). Blackbirds, hares, rabbits, gophers, prairie dogs, and ground squirrels are among the species commonly controlled to protect the public against potential threats of plague and rabies, or to eliminate what some property owners and lessees perceive as "nuisance wildlife" problems.

Future Supply

The outlook for many nongame species in Arizona, perhaps the majority of our non-aquatic or non-riparian dependent species, is bright. Many of these species are sufficiently abundant, adaptable, and widespread that, given ongoing management and conservation efforts by the Department and our government and private cooperators, we can be reasonably sure of their continued presence far into the foreseeable future.

For many other species, especially those closely tied to permanent surface water, natural riparian vegetation, or grasslands, the future is not so bright. Populations of many of these nongame species, especially those already known to be endangered or threatened, seem likely to decrease over the next few decades, despite efforts to conserve them and to educate the public. In general, these species occupy habitats highly prized for urban and other kinds of development, or for use by extractive industries. These species cannot simply be transplanted elsewhere to avoid the conflict. Their future will instead depend on the willingness and ability of humans to accommodate their needs where they occur, through innovative management strategies applied in a multiple-use setting. To succeed, we must also ensure that watersheds are protected restored.

Events of the past few decades suggest humans are both willing and, at least sometimes, able to accommodate wildlife needs and development interests. Today, improved conservation and management efforts are helping turn the tide. Local planning and zoning actions increasingly address ensuring wildlife and habitat values as "quality of human life" issues. The agencies managing Arizona's public lands are also becoming ever more aware of public interest in wildlife-oriented recreation and conservation in urban and rural settings. Federal land management agencies have specific legal mandates to ensure that these irreplaceable resources thrive on public lands. State trust lands in Arizona, however, are managed without such a mandate.

Another reason for cautious optimism about the future supply of nongame and endangered wildlife populations is simple economics. People are beginning to realize that the cost of preventative environmental medicine can be far less than the cost of rehabilitative measures. It is often simply good business to protect riparian and other key habitats through regulation, policy, and planning, rather than decimate them for short-term gain and then try to restore them to their natural condition. Hopefully, a balanced approach to land-use planning and conservation, with mitigation where appropriate, is indeed the wave of the future. The ability to attain the desired future condition very much depends on how the landscape is managed today.

Future Demand

People like wildlife, and because more people reside in Arizona every day, their interest will inevitably be translated into increased demand for wildlife conservation and for wildlife-based recreation. Arizona's human population grew by 53 percent from 1970 (1,775,399 residents) through 1980 (2,716,546 residents), by 35 percent from 1980 to 1990 (3,665,339 residents), and another 35 percent from 1990 to 2000 (4,961,953 residents), despite the fact that for every three people moving into the State, two moved out.⁵

Given this constant influx, it is not surprising that memberships in conservation organizations also increased. For example, the Arizona Chapter of The Nature Conservancy attained a membership of more than 60,000 in 1999. It is Arizona's largest individual-membership conservation organization. There is, of course, significant cross-membership among conservation, environmental, and sportsman organizations. Even allowing for overlap, however, the growing conservation-organization membership figures for Arizona suggest that wildlife viewing and other nonconsumptive activities are rapidly increasing here.

This growth in the numbers of interested people suggests continued increases in recreationist and other pressures on wildlife throughout the foreseeable future. Some nongame and endangered wildlife are sufficiently abundant and resilient to meet the demand. Other species and habitats, especially those centered in aquatic environments, are already at thresholds of tolerance. Visitor carrying capacities of many recreation areas are already frequently exceeded, especially in peak seasons. Visitors to selected water-based recreation sites in Arizona increased by 38 percent from 1980 to 1990 and another 32 percent from 1990 to 1999 (Lake Mead and Glen Canyon National Recreation Areas, and Lake Havasu, Lyman Lake, and Slide Rock State Parks).

Management agencies will be hard pressed to meet the even greater user demands of the next decade. Again, it seems likely that the future of Arizona's nongame and endangered wildlife will principally be determined by the outcome of society's need and ability to balance the appetite of a rapidly growing human population for land, water, and space with the desire to conserve rapidly dwindling supplies of the same resources.

⁵ Arizona Department of Economic Security statistics, available at <http://www.de.state.az.us>

Mission, Goals, and Objectives

Mission: Conserve, enhance, and restore (when appropriate and economically feasible) nongame and endangered wildlife as part of the natural diversity of Arizona, and provide opportunities for the public to enjoy these resources through uses compatible with their protection.

Goals:

1. Conserve, enhance, and maintain existing nongame and endangered wildlife populations and natural biotic communities.
2. Restore extirpated nongame and endangered wildlife and degraded natural biotic communities, where feasible to do so.
3. Provide and enhance public recreation opportunities for the full spectrum of nongame wildlife enthusiasts.
4. Prevent, minimize, or mitigate adverse impacts to nongame and endangered wildlife and biotic communities.
5. Avoid causing unnecessary adverse impacts from nongame and endangered wildlife resource conservation or use.
6. Provide information and guidance to, and cooperate with, land management agencies, property owners, lessees, and other interested or affected parties in nongame and endangered wildlife conservation and recreation programs.
7. Develop and implement ecosystem-based approaches to resource management.
8. Increase public awareness of nongame and endangered wildlife, conservation and recreation programs, and values.
9. Develop a stable funding base that enables the subprogram to responsibly address the full range of issues associated with Arizona's diverse nongame and endangered wildlife values.
10. Aggressively pursue new federal funding adequate to support all State conservation and management activities for species that are newly-listed federally as endangered or threatened.

Objectives (numbered according to the Goals they support):

1. Maintain conservation projects for at least 25 of the 113 species listed as *Wildlife of Special Concern in Arizona*.
2. Maintain at least five reestablishment projects for species listed as *Wildlife of Special Concern in Arizona*.
3.
 - a. Provide nongame wildlife-related recreation opportunities annually for at least 500,000 birdwatchers, wildlife photographers, backyard wildlife feeders and gardeners, hikers, campers, river runners, and other nongame enthusiasts.
 - b. Achieve at least a 60 percent satisfaction rating among Arizona's recreating public (i.e. 60% of Arizona's public indicating they were satisfied with their nongame wildlife-related recreation experiences over the past year).

4. Evaluate at least 500 external project proposals annually to identify and prevent, minimize, or mitigate adverse impacts to nongame and endangered wildlife and biotic communities.
5. Evaluate all Department project proposals and hunt guidelines to avoid causing unnecessary adverse impacts from or to nongame and endangered wildlife resource conservation or use.
6. Implement at least 20 Cooperative Agreements or Conservation Agreements with external cooperators, for nongame and endangered wildlife purposes.
7. Develop and implement, in collaboration with the Sportfish Management Subprogram, at least two watershed-based approaches that maximize complementary management of sportfish and native fish to meet the Department's conservation and recreation objectives.
8. Each year, distribute information about nongame and endangered wildlife, and Nongame and Endangered Wildlife Subprogram activities, in at least: 25,000 copies of *Arizona's Nongame News*; 35 of the Department's weekly news bulletins; 15 articles in *Arizona Wildlife Views* (magazine); 5 episodes of *Arizona Wildlife Views* (television show); 25 public or professional presentations by program personnel; Commission Orders 13, 14, 25, 40, 41, 42, and 43; 5 Nongame and Endangered Wildlife Program Technical Reports; and 3 Annual Work Plans and Performance Reports for the NGEWP Projects.
9. Work to see full enactment of the Conservation and Reinvestment Act, as proposed to Congress in the year 2000, and secure at least \$500,000 annually in cost-share agreements, contracts, and grants from outside entities to address issues associated with nongame and endangered wildlife values.
10. Propose and advocate (a) ten-fold increases for, and block granting to, state wildlife agencies for funds provided under Section 6 of the Endangered Species Act, (b) Congressionally-directed "line item" funds to the states to address specific "species at risk" partnership projects as proposed by the Western Association of Fish and Wildlife Agencies, and (c) reauthorization revisions to the Endangered Species Act to ensure that at the time of listing a species, sufficient funds are allocated to the states to carry out their Section 6 responsibilities for such species.

Strategies

Conservation

1. Improve the quality and availability of information on nongame and endangered wildlife, biotic communities, habitats, and other elements of natural diversity.
 - a. Develop more efficient, effective methods of data collection and analysis.
 - b. Maintain manual and computerized information systems sufficient to meet access (including information exchange), availability, project evaluation, and management needs within the Department and its cooperators.
 - c. Maintain standardized formats and procedures for reporting occurrence and other information on species of special concern.
 - d. Develop and implement ways to provide Phoenix and regional front-counter staff and the public with "read-only" availability of status and other summarized, current information ("read-only" means the reader cannot change the data).

2. Establish appropriately standardized inventory, survey, population modeling, monitoring, and other management techniques, protocols, and guidelines for nongame and endangered wildlife.
 - a. Identify species for which a species-specific approach is appropriate.
 - b. Identify guilds or species groups that provide for more efficient, effective management.
 - c. Evaluate the efficacy of a watershed or drainage basin approach to fisheries management, fully integrating sportfish and native fish management.
 - d. Develop and implement stream-side incubators (e.g. Whitlock-Vibert boxes) and any other on-site mechanisms, equipment, or technology as supplements to hatcheries in working toward recovery of Arizona's native Apache trout and Gila trout, and management of any other species for which they can be used effectively.
3. Train Department personnel and cooperators in inventory, survey, monitoring, and other wildlife management methods.
 - a. Provide training for Department personnel.
 - b. Provide training for volunteers.
 - c. Conduct inter-agency workshops.
4. Identify species, biotic communities, and habitat types that are declining or imperiled, or likely to become imperiled in the foreseeable future.
 - a. Maintain a list of *Wildlife of Special Concern in Arizona*.
 - b. Establish and maintain a list of *Biotic Communities of Special Concern in Arizona*.
 - c. Conduct a biennial "status of diversity" review.
 - d. Provide input to federal processes for endangered species designation and protection.
 - e. Identify priorities for, and develop, conservation assessments, strategies, and agreements for species and habitats of special concern and for species that are not yet imperiled.
5. Collect and evaluate occurrence (distribution), population, status, ecological, and other relevant information for nongame and endangered wildlife, biotic communities, or habitat types.
 - a. Implement inventory, survey, monitoring, and management projects.
6. Determine priority research needs for, and conduct research on, nongame and endangered wildlife.
 - a. Conduct, sponsor, or advocate research that contributes to recovery of federally listed threatened or endangered species.
 - b. Conduct, sponsor, or advocate research on species listed as *Wildlife of Special Concern in Arizona*.
 - c. Conduct, sponsor, or advocate research that contributes to maintaining or enhancing wildlife diversity.

7. Collaborate to enhance nongame and endangered wildlife, habitats, and biotic communities, or to prevent avoidable and mitigate unavoidable losses.
 - a. Participate in Section 7 consultations under the Endangered Species Act and/or under the National Environmental Policy Act.
 - b. Participate in community-based planning processes for ecological and human-related issues.
8. Implement management actions, conservation strategies, and recovery programs for all nongame and endangered wildlife and for biotic communities.
 - a. Review and recommend revisions in Commission Orders.
 - b. Develop, review, and/or recommend changes in State and federal laws, rules, and policies.
 - c. Ensure that water supplies, water quality, and water management programs are sufficient to protect wildlife values.
 - d. Maintain a process by which to set program priorities.
9. Identify and protect important habitats for nongame and endangered wildlife.
 - a. Develop or improve habitat protection regulations.
 - b. Evaluate properties identified by willing sellers for possible acquisition.
 - c. Develop non-acquisition management agreements or stewardship agreements with land management agencies and willing property owners and lessees.
 - d. Develop habitat improvement projects in rural and urban settings.
10. Provide guidance on Arizona's nongame and endangered wildlife management priorities.
 - a. Identify project proposal priorities for Federal Aid and Heritage grant processes.
 - b. Review and recommend changes in federal lists of, or actions pertaining to, wildlife and habitats of special concern.
 - c. Review and recommend changes in laws or rules pertaining to wildlife and habitats of special concern.
11. Develop and implement guidelines for reintroduction, translocation, and reestablishment of nongame and endangered wildlife.
 - a. Complete needs assessments for each group of nongame and endangered wildlife.
 - b. Reestablish populations of extirpated nongame species that are sufficient to warrant delisting or preclude listing because recovery has been achieved.
12. Identify strategies and specific mechanisms, where feasible to do so, for reducing real and perceived conflicts among nongame and endangered wildlife and game species, sportfish, agriculture, livestock, non-native wildlife, and public health and safety.
 - a. Develop watershed-based management plans that identify where sportfish and native fish will be managed, and structure management programs to minimize conflict between these two groups.
13. Develop a single integrated annual work plan for Nongame and Endangered Wildlife Program activities, embracing parts or all of the following project narratives: Identification, Inventory, Management, Acquisition and Protection (Heritage); Urban Wildlife (Heritage);

Nongame Wildlife Management Project (Federal Aid); Endangered Species (Endangered Species Act); and Nongame and Endangered Wildlife (Nongame Checkoff).

Recreation

1. Protect habitat for wildlife-oriented public recreation, consistent with wildlife and recreational values.
2. Increase public awareness of how to make effective, non-intrusive use of the existing wildlife recreation opportunities available to the public.
3. Enhance public recreation opportunities focused on nongame and endangered wildlife.
 - a. Establish or enhance wildlife viewing opportunities on lands open to public recreation.
 - b. Publish "how to/when to" information on wildlife recreation opportunities.
4. Work with public and private partners to set recreation-use guidelines and limits appropriate to nongame and endangered wildlife conservation needs.
 - a. Develop and advocate recreation-use guidelines.
 - b. Identify the need for area, road, or trail access stipulations or closures.
 - c. Monitor compliance with and the effectiveness of access restrictions.
 - d. Monitor compliance with and the effectiveness of recreation-use guidelines.

Information and Education

1. Increase the abilities of Nongame and Endangered Wildlife Program personnel to communicate effectively.
 - a. Provide training in public speaking.
 - b. Provide training in popular and scientific writing.
2. Survey public attitudes and perceptions about nongame and endangered wildlife, and related issues.
 - a. Complete a statewide general attitudes survey.
 - b. Conduct issue-specific surveys as needed.
 - c. Develop and implement a mechanism by which to more accurately estimate the number of days spent by the public in nongame-oriented recreational activities in Arizona, and to estimate the economic value of those days.
3. Broaden public awareness and understanding of the Department's nongame and endangered wildlife activities, accomplishments, failures, and program needs.
 - a. Conduct, sponsor, and participate in technical and popular workshops on the biology, management, and responsible public enjoyment of wildlife.
 - b. Develop slide shows, posters, brochures, books, and booklets, etc. on wildlife, related management issues, and recreational opportunities.
 - c. Solicit and incorporate peer review for reports and findings pertaining to wildlife issues.

- d. Make technical presentations on nongame and endangered wildlife, and related management issues at professional conferences and workshops.
- e. Publish articles pertaining to wildlife issues and program activities in professional journals, *Arizona Wildlife Views* (the Department's magazine), *Arizona's Nongame News*, and other magazines, newsletters, newspapers, etc.
- f. Provide information on wildlife issues and relevant Department activities to the public, via the Internet and television (e.g. via the Department's website and its television show, *Arizona Wildlife Views*).
- g. Inform the public of the status of nongame and endangered wildlife and actions or developments adverse to their protection and maintenance, and Department actions to reduce or eliminate such adverse influences.
- h. Promote environmental education, including Project WILD and similar efforts.

Appendix 1: *Wildlife 2006* Glossary

Activity: A specific action identifying a specific deliverable (Product or Service) to be produced, often through the Implementation Core Process. Activities are listed under Approaches in Job Statements and Operational Plans. They comprise the actions that can legitimately be charged to a specific Cost Code. Examples include: wildlife surveys; a training session on Population Viability Analysis; communications seminars; development of hunt recommendations; surveys of public attitudes; procurement; completing work diaries and Time and Travel reports; planning; developing or reviewing a law, policy, or rule; writing or reviewing a project proposal or a grant application; presentations to the Commission, a professional organization, or at a public meeting; and writing or reviewing an agency position paper, Performance Report, or technical paper. Activities are thus not a Process, Product, or Service, but the flow of work through a Core Process that results in an Output (Product or Service).

Annual Work Plan: A synonym for Operational Plan (see definition below).

Approach: A component of Project Narratives, Job Statements, and Operational Plans that defines how a Strategic Plan Objective will be achieved through one or more Activities.

Arizona Wildlife Views: This name is used for the Department's bi-monthly magazine and its episodic television show. Both outlets highlight wildlife resource issues and actions, hunting, fishing, wildlife viewing, and other aspects of wildlife conservation and recreation in Arizona.

Arizona's Nongame News: A newsletter published periodically by the Nongame and Endangered Wildlife Program, that is designed to inform the public about relevant issues and activities, and to solicit public comment on various issues.

Base (as in Base Program): A recurring Job, Approach, or Activity that maintains a minimum investment and level of service. Base Jobs are essential to basic operation of the Department. Through appropriate Approaches and Activities, these Jobs provide for maintenance of staff and offices, maintenance of baseline biological information, maintenance of resource management efforts, etc.

Biotic Community: A broad term referring to the "living" part of an ecosystem. It is an assemblage of animal and plant populations living within a prescribed area or habitat.

Biotic Communities of Special Concern in Arizona: A list of the biotic communities of Arizona that are of conservation concern. The list has not been drafted yet, but when it is developed its form and function will be modeled after Wildlife of Special Concern in Arizona.

Blue Ribbon (Fishing) Management Concept: This term, originally defined in the Department's Cold Water Strategic Plan of 1985, defines a concept intended to provide a maximum recreation benefit from a fisheries resource through special regulations and to provide an opportunity for a limited harvest of large fish.

Catch and Release Fishing: This is a practice adopted by some anglers that results in no harvest. It is for some an ethic and an approach to their fishing recreation. Catch and release or limited harvest regulations can be established (Commission Order 40) for a body of water in support of a management concept. This is one of many tools that can be applied by fisheries managers in support of a management objective for a fishery resource. Catch and release or limited harvest (reduced bag and possession limits) regulations may be applied as a tool to manage a fishery resource under a Blue Ribbon concept, a Wildfish concept, or a featured species concept. Establishment of restrictive harvest regulations is an action undertaken by the Game and Fish Commission as part of their annual amendment and approval of the fishing regulations (Commission Order 40).

Collaborate: To work jointly with others, especially in an intellectual endeavor. The Department views collaboration as an interactive process through which cooperators (partners) seek to find ways to make progress in defining and achieving mutually desirable goals and objectives.

Commission Orders: Regulations that establish species bag and possession limits, seasons of take, and areas open to hunting. Commission Orders are recommended by the Department, and approved by the Commission each year, with a variety of opportunities for public comment.

Community (as in biological, biotic, or ecological community): All the groups of organisms (including both plants and animals) living together in a given area, usually interacting with or depending on each other for existence.

Comprehensive Management System: An integrated planned-management system that includes all actions leading to development and implementation of goals and objectives, linking them to strategies, approaches, and activities, and finally assessing, reporting, and evaluating progress.

Conflict Resolution: A formal or informal process through which opposing interests work together to find solutions and common ground insofar as is possible, and to identify where such common ground cannot be gained. The result is negotiated agreement, or disagreement without rancor

Conservation Agreement: An agreement between the Department and one or more property owners, organizations, or government agencies, that is designed to protect or recover a species. Conservation Agreements sometimes provide sufficient conservation benefits to reduce or even eliminate the need for listing a species federally as threatened or endangered. A Conservation Agreement usually consists of a Conservation Assessment (information on the species, its current status, and existing protection measures; threats to the species; and conservation needs), a Conservation Strategy (mechanisms by which to meet the species' conservation needs), and a Memorandum of Agreement or Understanding among the partners in the conservation effort.

Continuous Process Improvement: Improving Customer Service by measuring, analyzing, and controlling Core Processes, Critical Systems, Critical Processes, and Critical Outputs to better meet Customer expectations.

Core Process: The fundamental steps that both drive and guide the creation of Products or Services. The Department's three Lines of Business (Business Administration, Off-Highway

Vehicle/Watercraft, and Wildlife Management) each have the same five Core Processes: Customer Assessment, Strategic Planning, Operational Planning, Implementation, and Evaluation. In turn, each Core Process is composed of processes, some of which are called Critical Processes. In this context, "Core" and "Critical" are not used as a descriptive adjectives denoting importance, but as nomenclature describing the hierarchy of process.

Critical Process: A sub-process of a Core Process that is a "building block" of the Core Process. Within the Department's terminology, a Line of Business is composed of Core Processes, and each Core Process in turn is composed of Critical Processes. In this context, "Core" and "Critical" are not used as a descriptive adjectives denoting importance, but as nomenclature describing the hierarchy of process.

Customer: Anyone who wants, needs, or uses our products or services. Customer may refer within the organization to a person to whom we directly deliver a specific work Product or Service, or to the ultimate collective Customers of the organization as a whole. However, the agency cannot be all things to all people. Some Customers are more important than others. These most important are called Critical Customers. A Critical Customer is one whose needs and expectations drive the agency's strategies and operations. We must strive to meet the needs of our Critical Customers 100 percent of the time. We cannot ignore other Customers' needs, but some might be deferred. The benefit to us, is that we use Critical Customer values to set priorities for what we do, and perhaps we can reduce the level of Products and Services to lower priority Customers.

Customer Assessment: A Core Process within the Department's Lines of Business that identifies and priority-ranks Customer needs, wants, expectations, and values related to Department Products, Services, Processes, and issues.

Customer Focus: Customer focus drives the Department to create Products and Services that are valued by the Customer, and which lead to Customer satisfaction. The Customer is the true judge of Product and Service Quality. The Department must show constant sensitivity to emerging Customer and market requirements, and measure factors that drive Customer satisfaction. This sensitivity also applies to internal Customers; building and maintaining positive internal relationships is as important as external relationships.

Ecosystem: A functioning unit of nature that combines biotic (living) communities and the abiotic (non-living) habitat elements with which they interact. Ecosystems vary greatly in size and characteristics, and are often defined, and for human convenience, are managed as if they were discrete entities but they are not. Ecosystems ultimately are continuous on a worldwide basis.

Ecosystem Management: Generally construed to mean management at the ecosystem or ecological community level (unconstrained by political or land ownership bounds), with consideration of the community as a whole outweighing the interests of any single component. Sometimes simply a synonym for broad-scale management as opposed to management at a local scale. See also Landscape-level Management, below.

Efficiency (as in Efficiency Measure): (a) A measure of the relative amount of resources used to produce a certain amount of Products or Services; or (b) Outputs/Inputs; or (c) a type of measure

that reflects the cost of providing a Product or Service. For example, assume that it costs an average of \$70.00 in personnel time and resources to authorize each "type B" permit. An alternative Process would be 50% more efficient if it authorized an equal quality permit for an average of \$35.00.

Evaluation: A Core Process within the Department's Lines of Business that entails systematic Time/Cost/Value (T/C/V) review of agency mission, goals, objectives, strategic and operational plans, performance measures and metrics, and operations. In TQL/TQM, Evaluation has two principal components: Evaluation of Processes, and Evaluation of Products and Services as Outputs of Processes.

Extinct: A species of plant or animal that is no longer represented by living individuals, either in the wild or in captivity.

Extirpated: A species of plant or animal that has been eliminated from a specific area in the wild (e.g. extirpated from Arizona, or extirpated range-wide from the wild), but which is still represented by living individuals elsewhere in the wild or in captivity.

Fingerlings: Juvenal fish, generally smaller than the length of a finger, hence the name.

Goal: A directional statement for a specific Program or Subprogram or group of Programs or Subprograms. Goals are directional, qualitative, rarely attained, and usually not quantified.

Guild: An association of organisms with similarities that reflect the issue at hand. For example, the guild of cavity-nesting birds would include woodpeckers, bluebirds, etc. The guild of rock-dwelling lizards would include chuckwallas, Yarrow's spiny lizards, night lizards, etc. A guild of grazing animals (as opposed to wildlife) could include elk, livestock, and desert tortoises.

Heritage Fund: A funding source created by a coalition of environmental organizations, and approved by Arizona voters, that annually provides (subject to availability) \$10 million each to the Department and Arizona State Parks. The Department's allocation is used to fund five areas of activity that benefit wildlife, the citizens of Arizona, and the State's economy as well. The five areas are: public access, urban wildlife, environmental education, habitat evaluation and protection, and IIPAM -- identification, inventory, protection (including acquisition), and management.

Implementation: A Core Process within the Department's Lines of Business that describes how the products and services from Operational Planning are actually scheduled and completed. Implementation is "to carry out actions through the expenditure of resources."

Job Statement: A Project-level strategic document (1-yr timeframe) that provides a bridge between a Project Narrative (6-yr timeframe) and the Operational Plans (1-yr timeframe) that will implement that Project in that year. Job Statements define and set priorities for the Strategies, Approaches, and Activities approved for inclusion in Work-Unit specific Operational Plans during that year. Job Statements include general budget and labor allocations, and identify specific Products and Services (deliverables) to be produced in that year.

Landscape-level Management: Generally construed to mean management at the ecosystem or ecological community level, with consideration of the community as a whole outweighing the interests of any single component. Sometimes simply a synonym for broad-scale management as opposed to management at a local scale.

Leadership: A concept that, under TQL/TQM, should be practiced at all levels within the Department. Leadership involves: (a) envisioning the future, coordinating development of a coherent mission, overseeing development and control of products and services that have exemplary quality and features, and providing a motivational climate for people; (b) the ability to decide what needs to be done, and then to get others to want to do it; and (c) creation of a compelling vision that has intense meaning to others through effective communication, teaching, mentoring, commitment, concern, and constancy.

Line of Business: A collection of similar Products and Services that can be combined into a framework that has organizational meaning. All smaller elements within the Line of Business can ultimately be tied back to a common mission, vision, or goal. The Department has three Lines of Business: Business Administration, Off-Highway Vehicle/Watercraft, and Wildlife Management.

Mission: A short comprehensive statement of purpose. The mission identifies what the Department or a given Work Unit does (or should do) and for whom it does it.

Mollusks: A diverse group of animals that includes snails, slugs, mussels, clams, and their relatives.

National Environmental Policy Act: A law of disclosure that requires the federal government to analyze a project or action, to solicit and evaluate public comment, and to report on the environmental impacts of the project or action.

Needs Assessment: An evaluation of the factors affecting a given situation (e.g. a species), and the possible resolution or mitigation alternatives. It may include identification of the natural elements necessary for a species' persistence (e.g. old growth forest, specific prey items, free-flowing water), and the extent to which or methods by which the species or population or habitat can be managed. It also considers relevant activities, or lack thereof, by other governmental and nongovernmental entities.

Neotropical: Referring to flora or fauna originating from, or residing in, "tropical" areas of North, Central, and/or South America. In this context, "tropical" is used in a latitudinal sense, rather than as a habitat or climate descriptor.

Nongame Checkoff: A donation mechanism on the Arizona income tax form that enables taxpayers an opportunity to voluntarily contribute funding for the Nongame and Endangered Wildlife Program.

Nongame and Endangered Wildlife Program Technical Reports: Reports generated by the Department's Nongame and Endangered Wildlife Program staff, or contractors. Typically, such

reports present the results or outcomes of a project. In some cases, they address management procedures, Conservation Agreements, etc.

Non-native: A species that is not native to Arizona. As used in this document, the term includes species that may be native to states other than Arizona, and/or to lands and waters outside the United States. Some wildlife agencies, especially federal agencies, use “exotic” as a synonym for the latter group.

Objective: A concise statement of what will be accomplished (specified), how much will be accomplished (quantified), when it will be completed (deadline), and by whom it will be completed (responsibility). Goals provide a directional context for setting objectives. Objectives must be SMART. That is, they must be Specific, Measurable, Aggressive yet Attainable, Result-oriented, and Time-bound.

Operational Planning: A Core Process within the Department's Lines of Business whereby strategic objectives are converted to management actions by allocation of money and human resources. An Operational Plan describes how an objective will be implemented in a specific year (two years for some budget documents). Operational planning "gives life" to Strategic Plans by stating specifically who does what, with which resources, and when.

Operational Plan: An annual plan, usually specific to a Subprogram or a Work Unit, that provides specific detail on the scope and scale of work to be completed for a fiscal year. Operational Plans further define how the Approaches and Activities defined in relevant Project-level Job Statements will be carried out within that Work Unit in that year. They include specific budget and labor allocations, and identify specific Products and Services to be produced in that year. An Operational Plan links back to the Strategic Plan in step-wise progression through the Job Statement, the Project Narrative, and the Subprogram Narrative.

Outcomes: End results, or impacts, of the Products or Services provided. If a process succeeded in achieving its objective, what would be the desired Outcome? Example: If the Department produced and stocked 750,000 “catchable” rainbow trout, were the anglers (Customers) satisfied?

Outputs: The Product or Service produced or the number of Customers served. Critical Outputs are of great value to Department Customers. Problems such as inefficiencies or ineffectiveness in producing Critical Outputs negatively skew the cost-benefit (Value) ratio of a deliverable (Product or Service), and indicate the need for near-term Continuous Process Improvement. In such instances, a first step in improvement is to map the Critical Output against its Core Process, to determine whether its production has diverged from the model in unproductive ways.

Partners: Entities with whom the Department cooperates. The term is inclusive; any person, agency, organization, or other entity may be a partner to the Department. The term thus includes, among many other entities, anglers, bikers, birders, birdwatchers, boaters, businesses, concessionaires, Congressional delegates, conservationists, environmentalists, governments of all kinds, guides, hikers, hunters, industry, legislators, landscape and wildlife photographers, nongovernmental organizations, outfitters, private landowners, private and public lands lease holders, ranchers, trappers, and wildlife watchers.

Partnerships: Entities affiliated with each other for a common purpose. The affiliation may be informal, or formal. It may be voluntary, or legally binding. It may be long term, or ephemeral. The Department's partnership philosophy is to actively engage in identifying and resolving issues through collaborative conflict resolution, while striving to find mutually acceptable and beneficial outcomes for all interested and affected parties.

Pathogen: An organism that causes or triggers a disease process in plants or animals. A pathogen may be viral, bacterial, or parasitic.

Performance Objectives, Measures, and Metrics: Evaluation tools used to measure effectiveness and efficiency in achieving specific objectives, and progress toward producing desired benefits. The Objective defines the desired end-point (outcome); the Performance Measure is the standard of comparison; and the Metric is the standard of measurement for that comparison. Examples: Under an Objective of "Maintain a quality Blue Ribbon fishery," (a) length and weight are Measures of fish growth, and inches and ounces are Metrics for length and weight; and (b) Customer satisfaction is a Measure of success, and a target approval rating of 99 percent is a Metric for customer satisfaction. The Department's Agency Balanced Scorecard, each of the Lines of Business, and all Core Processes have Performance Objectives, Measures, and Metrics.

Performance Report: Summarized results for the Fiscal Year's work effort within a given Project or Job. Performance Reports are written at the level of, and follow the format of, a specific Work-Unit Operational Plan. Central Project staff compile the Work Unit reports into Project-level Performance Reports. Performance Reports provide appropriately detailed information on planned Activities that were carried out (Accomplishments), but also on Significant Deviations -- what was planned but not done, or done but not planned.

Process: (a) The steps taken in producing a Product or providing a Service; or (b) a sequence of Activities, tasks, or functions intended to achieve a result, typically to create added value for the Customer. A Process is defined not by the things people do, but by the sequence of things done, or tasks performed, to produce the Output. Processes begin with Inputs and change them, add to them, or combine them to create new Products or Services (Outputs). The Department's five Core Processes drive creation of our Products and Services.

Process Owner: For any given Process, the employee responsible for defining Outcomes, determining actions, committing resources, and meeting Customer-driven targets. Process Owners are responsible for: (a) identifying Customers and Suppliers; (b) identifying the products and services provided; (c) identifying what the Customers and Suppliers consider important; (d) defining the Process for doing the work; (e) mistake-proofing the Process and eliminating wasted effort; and (f) ensuring continuous improvement by measuring, analyzing, and controlling the Process to better meet Customer expectations. A Critical Process Owner is thus the single person responsible for maintaining the quality of a specific Critical Process, and for providing appropriate guidance to their Customers, the persons who are moving work (e.g. developing an Output) through that process. Agency leadership must ensure that Critical Process Owners have the authority and influence essential to carry out their responsibilities.

Product: Something that is created through Department action. Products are often tangible entities that are sometimes used or consumed in a different place and time from where they were created. Examples include: reports, other publications, fishing piers, hatchery-reared fish, etc. Intangible products include: angler days, hunter days, birdwatcher days, recreation days, etc.

Programs: The primary focuses of an organization, as determined by legislation or mandate. The Department has three Programs: Off-Highway Vehicles, Watercraft, and Wildlife Management.

Project: A group of inter-related Jobs needed to accomplish a planned undertaking within a Subprogram. Projects secure the budget and staff time needed to implement a strategy, solve a problem, and achieve an objective. Project lines-of-command routinely cross Work Unit bounds.

Project Leader: The employee with lead responsibility for ensuring proper planning, achieving the objectives of, and evaluating a specific Project. Project Leaders are typically assisted in these activities by employees from a variety of Work Units. Responsibility for carrying out these activities is delegated down through the Project staff, and accountability for results rolls up through the Project staff. Project staff are also accountable through their Work Unit supervisory chain for their actions.

Project Narrative: (previously = Project Statement). Strategic Planning documents that serve as bridges between Strategic Plan objectives and strategies (e.g. at the Subprogram level) and (Project-level) Job Statements. Project Narratives are written for a 3 to 6 year period (or longer), and describe the goal(s) of the Project, the need for the Project, the expected benefits of the Project, and the Strategic Plan objectives/strategies that will be Operationally Planned through Approaches/Procedures and Activities/Tasks in the Job Statements. They also identify priorities for the Approaches and Activities to be addressed in the Job Statements.

Project WILD: Project WILD is an interdisciplinary, supplemental, environmental, and conservation education program emphasizing all aspects of wildlife and habitat. Correlated to both state and national educational standards, Project WILD uses simulation games, hands-on activities, and other techniques to help students develop and apply critical thinking skills in addressing wildlife-related issues.

Public Lands: For the convenience of our readers, in this document “public lands” means any land that is owned or managed by any government entity, whether federal, state, or local. The State’s wildlife jurisdiction varies considerably on federal lands (depending on a number of factors), and does not extend to Native American reservations (tribal lands). However, detailing each variation in each instance where public lands are addressed in this plan would result in complicated text that would impede, not facilitate, reader comprehension.

Quality: (a) The degree or grade of excellence; and/or (b) the totality of a Product's or Service's features and characteristics that determines the extent to which it meets Customer needs.

Reintroduction: An attempt to establish a species in an area that was once part of its historical range, but from which it has been extirpated. The principle aim of any reintroduction is to re-establish a viable, free-ranging population in the wild

Responsive Management: Evaluation and incorporation of the human element into wildlife management, through use of public opinion and perception collection and analysis, and monitoring societal demographics. Responsive Management per se may be a trade-marked proprietary approach to a more general construct of sampling the public to determine acceptance, awareness, expectations, needs, and support for Department programs, products, and services, or resource and recreation issues, for the purpose of effecting Continuous Process Improvement.

Risk Assessment: An evaluation of the degree of “threat” posed by an issue, or to a species or habitat. The assessment is made by developing a series of questions that help determine whether the “risk” is significant, and, if so, what strategies and tactics would reduce the risk. The assessment also provides information on the cost (financial and otherwise) of not addressing the risk.

Service: Services are intangible results that are both produced and consumed at the same time and place. Examples include education, licensing, registration, law enforcement, etc.

Sportfish: Any species of fish, whether native or non-native, that is managed by the Department for recreational fishing or for potential recreational benefit.

Stable Funding: A revenue source that is sufficient in amount, and consistently dependable from year to year, that it can be used to support base program costs. Pittman-Robertson and Dingell-Johnson funds, and state game and fish funds, are relevant long-standing models for state wildlife agencies. Their revenues vary from year to year, but they vary around an average that is sufficiently high to enable the Department to fund permanent employees and other base program costs with them, and still maintain a buffer (reserve) against “down” years.

Stakeholder: Any person who believes they have an interest in the performance or Outcomes of our organization. Stakeholders do not necessarily use our Products or receive our Services.

Status of Diversity Review: A Department-convened review of the status of wildlife in Arizona. The review entails soliciting comment from knowledgeable individuals, especially recognized experts, on species with which they are familiar. Department biologists synthesize the comment, and managers use the information to identify management needs and to set priorities for conservation and other management activities.

Strategic Planning: A future-oriented Core Process within the Department's Lines of Business. It entails diagnosis, objective setting, strategy building, and priority setting that are essential to TQL/TQM. It relies on careful consideration of the Department's capacities and environment, and ultimately leads to significant resource-allocation decisions. Strategic planning is the process by which guiding members of the Department envision its future and stimulate development of procedures and operations essential to achieving that vision. Our standard strategic planning model asks the following questions, with respect to a 3 to 6-year (or longer) time frame:

1) Where are we now?

Environmental monitoring and determination of current status

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|------------------------------------|---|
| 2) Where do we want to go? | Goals, objectives, and strategies in the strategic plan |
| 3) How do we get there? | Operational planning (priorities and budget) |
| 4) How do we measure our progress? | Evaluation |

At a Program level, well-integrated strategic planning links related Subprograms into a single strategic document. This allows discussion of common issues and opportunities, and strategy integration in areas that impact those and other Subprograms.

Strategic Plan: A document that determines the direction and overall success or failure of the Department, by determining the direction of one or more Subprograms. A Strategic Plan identifies the issues, goals, objectives, strategies, and overall priorities for Programs over a 3 to 6-year period (perhaps longer), and communicates that information to all Program and Subprogram Customers (whether internal or external). A Strategic Plan thus provides the conceptual umbrella under which more specific Subprogram and Project Narratives (typically 6-yr), still more specific Job Statements (1-yr), and eventually detailed Operational Plans (typically 1-yr) are developed to guide the Department's daily operations.

Strategy: A solution or means by which to resolve problems. Strategies most often lead directly to defining Approaches and Activities in Job Statements and Operational Plans.

Subprogram: A group of Projects within a Program that support the Department's Mission or legislative mandates. The Wildlife Management Program has three Subprograms: Game Management, Sportfish Management, and Nongame and Endangered Wildlife Management.

Taxonomy: The science of classifying living organisms by using their genetic, evolutionary, and morphological similarities to establish hierarchies of relatedness among them.

Total Quality Leadership: Synonymous with Total Quality Management, except that emphasis is placed on everyone in the organization demonstrating leadership toward exceeding Customer expectations by taking personal responsibility for improving processes.

Total Quality Management: TQM is common sense, rigorously applied. It is a people-focused management system that aims at continual increase in Customer satisfaction at continually lower real cost through Continuous Process Improvement. It is a total system approach (not a separate area or program) and an internal part of high-level strategy; it works horizontally across functions and Work Units, involves all employees top to bottom, and extends backward and forward to include the supplier chain and the Customer chain. It stresses learning and adaptation to continual change as keys to organizational success. The foundation of total quality is philosophical: the scientific method. The core principals of TQM are: (a) focusing on achieving Customer satisfaction; (b) measurement-driven continuous improvement; (c) everyone involved; and (d) management systems aligned. It is both a comprehensive managerial philosophy and a collection of tools. TQM is an ongoing Process unique to each organization, and is never completed.

Value: The ratio of what the Customer received (= x) vs. what the Product or Service cost (= y); or $(x \div y = \text{Value})$. What the Customer received is a function of the actual Product or Service they received, and their satisfaction with it. What it cost the Customer is a function of the monetary price of the Product or Service, and the Customer burden (i.e. hardships and frustrations). Only the Customer judges Value for the agency, and Value is judged by what the Customer perceives they receive in comparison to what they perceive it costs. Thus, Value is affected by quality in fact, and by quality perceived. Ultimately, Value is the most important criterion for measuring performance in meeting Customer expectations.

Vision: A compelling conceptual image of the desired future. A vision focuses an idea about a future state of being in such a way as to excite and compel an organization toward its attainment. It crystallizes what leadership wants the organization to be in the future.

Watershed-based Management: A management approach that is applied within a specific drainage basin. Watershed-base management may apply at the species, species-group, habitat , or landscape (all species, all habitats) level.

Wildlife: In this Strategic Plan, “wildlife” means all species for which the Commission and Department are legally responsible, pursuant to Arizona law. Thus, wildlife includes crustaceans, mollusks, fish, amphibians, reptiles, birds, and mammals.

Wildlife of Special Concern in Arizona: A list that identifies wildlife that are of concern to the Department because their occurrence in Arizona is, or may be, in jeopardy, usually because of past and/or present habitat disturbances or the impacts of other species. Its focus is thus the degree to which habitats or populations have been impacted, and each species’ probability of extirpation from Arizona. The list informs the public and other agencies as to which species of wildlife are to some extent imperiled, and provides simplified guidance on appropriate conservation actions. The list is basically an information and education tool, and not a regulatory action.

