

**ARIZONA'S
COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY:
2005-2015**



Arizona Game and Fish Department
2221 West Greenway Road
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June 28, 2005

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RECOMMENDED CITATION

Arizona Game and Fish Department. 2005. Arizona's Comprehensive Wildlife Conservation Strategy: 2005-2015. Arizona Game and Fish Department, Phoenix, Arizona.

PROJECT FUNDING

Funding for the development of this strategic plan was provided by: Arizona Game and Fish Department's Heritage Fund (*Lottery Dollars Working for Wildlife*); voluntary contributions to Arizona's Wildlife Checkoff; Wildlife Conservation and Restoration Program; and the State Wildlife Grant Program.

FOREWORD

Duane L. Shroufe, Director
Arizona Game and Fish Department

March 31, 2005

Arizona's Comprehensive Wildlife Conservation Strategy is the opportunity of a lifetime that many people and organizations have worked for decades to create.

Wildlife management in the 20th century was influenced by the 1937 Pittman-Robertson and 1954 Dingell-Johnson acts. The former brought funding and stability to game management programs in state wildlife agencies. The latter accomplished the same thing for sport fish management. Both programs rely on user fees (excise taxes) to generate funds to ensure, through state programs, which wildlife resources would thrive and continue to provide enjoyment for future generations.

In contrast, nongame wildlife and endangered species programs were provided for, and mandated, by the 1973 Endangered Species Act and 1980 Forsythe-Chafee Act. However, no dedicated funding for state programs was provided.

Fortunately, the picture began to change in 1994 with a national grassroots effort to establish permanent funding for nongame wildlife. Although that initiative, Teaming With Wildlife, has yet to generate dedicated funds comparable in amount and stability to those provided by Pittman-Robertson and Dingell-Johnson, it led to enactment of the Wildlife Conservation and Restoration Program in 2001 and its 2002 successor, State Wildlife Grants. With these programs, Congress began to provide much-needed funds, for conservation of the full array of wildlife with emphasis on species that were not adequately funded or that were imperiled and in need of conservation attention.

Congress intended that these 2 programs provide enough funding to stem the rising tide of federally-listed endangered and threatened species. Congress required each state accepting funding to produce a Comprehensive Wildlife Conservation Strategy before October 2005, to describe how over the next 10 years it would meet the challenges of managing wildlife in the 21st Century.

Congress also required that states build their Comprehensive Wildlife Conservation Strategies through collaboration with stakeholders and interested parties, whether private, public, or tribal. This broad public participation must be well documented. Perhaps even more important, partnerships and new partnership opportunities must be evident throughout the implementation strategies. Strategies across the Nation are expected to collectively articulate a vision of public engagement in planning and delivering a comprehensive wildlife conservation program. Imagine 50 states, 5 territories, and the District of Columbia working toward the same goal: wildlife conservation, with a clear commitment to inform and educate the public about wildlife resources, conservation needs, and opportunities to enjoy wildlife through wildlife watching, sustainable use, or the pursuits of an armchair enthusiast.

Little more than a decade ago, as the Teaming With Wildlife initiative was born, the leaders of our state wildlife agencies and countless collaborators set in motion a change that will have a profound impact on our agencies, on our staffs, and on our constituents.

Are we ready? On behalf of the Arizona Game and Fish Commission and Department, I invite you to join us in proving that we are all ready. Together we can make this Strategy a living, working, evolving partnership for effective stewardship of our diverse and abundant living wildlife legacy.

Duane L. Shroufe
Director, Arizona Game and Fish Department

The Department's mission:

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.

ACRONYMS USED IN ARIZONA’S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY

ACOE	Army Corps of Engineers
ADA	Arizona Dept of Agriculture
ADEQ	Arizona Dept of Environmental Quality
ADHS	Arizona Dept of Health Services
ADOT	Arizona Dept of Transportation
ADWR	Arizona Dept of Water Resources
AFB	Air Force Base
AGFC	Arizona Game and Fish Commission
AGFD	Arizona Game and Fish Department
AHN	Apache Highlands North Ecoregion
AHS	Apache Highlands South Ecoregion
ASP	Arizona State Parks
ASLD	Arizona State Land Department
ATV	All-Terrain Vehicle
AWLW	Arizona Wildlife Linkages Workgroup
AZDEMA	Arizona National Guard-Department of Emergency and Military Affairs
AZNM	Arizona-New Mexico Mountains Ecoregion
BLM	Bureau of Land Management
CP	Colorado Plateau Ecoregion
CSE	Center for Sustainable Environments
CWCS	Comprehensive Wildlife Conservation Strategy
CMP	Conservation Measures Partnership
DHS	Department of Homeland Security-Border Patrol
DOD	Department of Defense
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHA	Federal Highways Administration
GIS	Geographic Information System
HCP	Habitat Conservation Plans
HPC	Habitat Partnership Committee
HDMS	Heritage Database Management System
IAWFA	International Association of Fish and Wildlife Agencies
IPCC	International Panel on Climate Change
IUCN	International Union for the Conservation of Nature (= World Conservation Union)
LLC	Limited License Company
MD	Mohave Desert Ecoregion
MOU	Memorandums of Understanding
MS	Microsoft
NAAT	National Advisory Acceptance Team
NABCI	North American Birds Conservation Initiative
NEPA	National Environmental Policy Act
NF	National Forest
NGO	Non-Government Organizations
NP	National Park

ACRONYMS CONTINUED

NPS	National Park Service
NRCS	Natural Resource Conservation Service
NWR	National Wildlife Refuge
NWTF	National Wild Turkey Federation
PARC	Partners in Amphibian and Reptile Conservation
PIF	Partners in Flight
RD	Ranger District
SD	Sonoran Desert Ecoregion
SHA	Safe Harbor Agreements
SW	Southwest
SWG	State Wildlife Grants
TNC	The Nature Conservancy
TNW	Threatened Native Wildlife in Arizona
TWW	Teaming With Wildlife Committee
USBR	US Bureau of Reclamation
WCC	Wildlife Conservation Council
UA	University of Arizona
USDA-WS	US Dept of Agriculture-Wildlife Services
USFWS	US Fish and Wildlife Service
USFS	US Forest Service
USGS	US Geological Survey
WGCN	Wildlife of Greatest Conservation Need
WSCA	Wildlife of Special Concern in Arizona
4WD	Four-Wheel Drive

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ARIZONA'S COMPREHENSIVE WILDLIFE CONSERVATION STRATEGY: 2005-2015

INTRODUCTION

The Arizona Game and Fish Commission (Commission) and Department (Department) serve the people of Arizona as stewards of the State's wildlife. These resources are a public trust, managed for the benefit of present and future generations. Under Arizona Revised Statutes Title 17, the Commission and Department are vested with the authority to manage the State's wildlife.

Wildlife management is influenced by many factors. Some factors, such as drought, wildfire, and changes in human population demographics are beyond the Department's authority. In addition, many or most of the resources upon which wildlife depend—primarily habitat—reside on lands not owned by the Department. Therefore the Department relies on the cooperation of multiple partners (private, state, federal, and tribal) with whom they share stewardship responsibility for conserving wildlife resources.

WILDLIFE CONSERVATION IN ARIZONA

Arizona has a rich biological diversity of wildlife and wildlife habitats—Arizona ranks third in the nation for the number of native bird species, second for reptiles, fifth for mammals, and eighth for overall vertebrate animal diversity (Stein and others 2000). Efforts to conserve these invaluable resources have been robust and productive over the last 75 years. The Commission and Department were created in 1929 by a citizen initiative to protect and enhance the State's wildlife, primarily game species and later sport fish. In the late-1960s, Arizona became the first state in the country to dedicate a full-time employee (Richard Todd) to nongame wildlife conservation. The State of Arizona has a long record of commitment and achievement in wildlife conservation.

Through the 1980s and 1990s, the Department became widely acknowledged by its peers as being among the Nation's preeminent state wildlife agencies. Numerous national and regional awards affirmed the Department's achievements and leadership roles. Many factors contributed to this recognition, among them: the significance of state wildlife and habitat issues, the depth and breadth of its programs, the expertise and accomplishments of its staff, and the strength and effectiveness of its partnerships and public support. Game management, sport fish management, and nongame and endangered wildlife management were and continue to be the foundation for Arizona's wildlife legacy.

As the significance of wildlife and habitat issues grew, the need for change and even greater accomplishment became clear. Programs that had historically been relatively independent, and often single-species based, needed to become more integrated and holistic. A focus on landscape-level conservation to achieve greater efficiency and effectiveness was needed as pressures on wildlife and wildlife habitat grew along with an ever-increasing human population. Also, the agency's role as the management authority of Arizona's wildlife resources began to evolve toward facilitator and enabler, with more emphasis on collaborative, voluntary

conservation partnerships to complement and sometimes replace more traditional regulatory approaches.

As the state and national economies changed, the need for even greater fiscal responsibility to achieve the most value for the dollar became clear. Wildlife management followed the example of successful private businesses, where best business practices dictated that priorities needed to be set and progress toward goals and objectives needed to be measurable, reported, and carefully evaluated so constant improvement could be achieved.

The Comprehensive Wildlife Conservation Strategy is designed to address these needs and requirements. It focuses partnership efforts on conservation at the landscape level, to address stressors that constrain wildlife conservation and wildlife-related recreation opportunities. In addition to limiting the quality of human life in wildlife-rich Arizona, these stressors often limit wildlife-related contributions to our economy. Wildlife is an important and growing component of numerous local economies (Silberman 2001; Southwick Associates 2003).

This Strategy provides a 10-year vision for achievement, subject to adaptive management and improvement along the way under the watchful eye of the Commission and its partners. The Strategy covers the entire State, from low desert to alpine tundra. In any given area, it provides the Department and its partners a clear sense of what needs to be done, and opens the door to a variety of ways to get it done. It also provides opportunities for many partners to take leadership roles in getting it done. Collaboration and synergy will be key to shared success, and shared success will be key to continued Congressional support for the programs that help fund the partnerships.

CWCS AND THE STATE WILDLIFE GRANT PROGRAM

As a funding requirement of the State Wildlife Grants program (TWW 2003a), Congress charged each of the 56 States and Territories (hereafter referred to as 'States') with developing a statewide "Comprehensive Wildlife Conservation Strategy" (CWCS). These strategies will provide an essential foundation for the future of wildlife conservation and a stimulus to engage the States, federal agencies, and other conservation partners to strategically think about their individual and coordinated roles in prioritizing conservation efforts. State fish and wildlife agencies are leading the strategy development process with the aim to create a strategic vision for conserving the States' wildlife. While each strategy will reflect a different set of issues, management needs, and priorities, the States are working together to ensure nationwide consistency and a common focus on targeting resources to prevent wildlife from declining to the point of endangerment. These efforts are being coordinated through the Teaming With Wildlife Committee (a standing committee of the International Association of Fish and Wildlife Agencies) at a national level. To remain eligible for State Wildlife Grant funding, State strategies need to be submitted to the National Advisory Acceptance Team by October 1, 2005, for evaluation and approval. In addition to the aforementioned requirements, these plans must be reviewed at least every decade (TWW 2003b).

EIGHT REQUIRED ELEMENTS OF THE CWCS

Congress identified 8 required elements to be addressed in each State's wildlife conservation strategy (TWW 2003c). Congress also directed that the strategies must identify and be focused on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife-related issues. The strategies must provide and make use of these 8 elements:

- (1) Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife; and,
- (2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1); and,
- (3) Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats; and,
- (4) Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions; and,
- (5) Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; and,
- (6) Descriptions of procedures to review the strategy at intervals not to exceed 10 years; and,
- (7) Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.
- (8) Congress also affirmed through this legislation that broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

HOW THE CWCS WILL BE USED

Currently, the Department operates under separate strategic plans for its Wildlife, Watercraft, and Off-Highway Vehicle programs. Each program's strategies drive operational plans and implementation plans at the work unit level. As these 3 programs and the Business Administration program are brought together in the Department's next-generation strategic plan,

Wildlife 2012, the CWCS will provide an essential link between the broader wildlife elements of the strategic plan and the details of the operational and implementation plans. Thus, strategies from the CWCS are delineated in each of the 4 programs for 6 designated focal areas: Conservation, Recreation, Information and Education, Laws and Law Enforcement, Research, and Administration (AGFD 2004).

For Department cooperators, the CWCS provides guidance to partner agencies, tribes, local governments, private landowners, business/industry affiliations, universities, and non-government organizations by identifying wildlife and habitat conservation goals and information needs at a strategic level. These conservation strategies and information needs apply to various spatial scales—statewide, regional, and site specific—and can be integrated into revisions of land management plans (for example: U.S. Forest Service forest plans, Bureau of Land Management habitat management plans, Department of Defense natural resource management plans, U.S. Fish and Wildlife Service Refuge System management plans, and local government/private landowner participation in Safe Harbor Agreements or Habitat Conservation Plans). The CWCS is one nexus for potential funding and improved coordination of partner-based conservation activities.

Arizona's CWCS is not designed to replace or duplicate the Department's existing wildlife management strategic plan, *Wildlife 2006* (AGFD 2001). Both plans serve different needs and reporting objectives—*Wildlife 2006* meets the Department's responsibilities for managing Arizona's wildlife under Title 17 obligations to the State, while the CWCS meets the Department's eligibility to receive State Wildlife Grant funding. The objectives and approaches defined by Arizona's CWCS will be used to prioritize federal "wildlife diversity" funds, matched with support from other sources, to ensure the implementation of conservation activities.

DEVELOPING ARIZONA'S CWCS WITH INPUT FROM AGENCY PARTNERS AND THE PUBLIC (ELEMENT 7 & 8)

Various administrative and technical teams, stakeholder meetings, public input, responsive management surveys, and databases contributed to developing Arizona's CWCS:

- Oversight Group (Department divisional and work unit chiefs)
- Ecoregion Workgroup (Department technical staff and cooperating federal, state, and tribal resource managers and technical staff)
- Scientific Review Team (species experts, academics, and agency/non-government organization professionals)
- Stakeholder committees and councils (for various taxon-related or habitat conservation projects)
- Databases with new and existing management plans and agreements for conserving species and habitats
- Public opinion surveys on various wildlife-related and outdoor recreation topics
- Wildlife Summit workshops and open forum public meetings
- Department website (with comment field and background information on the CWCS)

Detailed descriptions of the Department's CWCS-related teams, meetings, opinion surveys, and databases are found in CWCS Processes (Companion Document A).

In the development of the CWCS, the Department used extensive outreach to inform and encourage participation from the public and potential partners: 20 staff presentations; 28 presentations to external agencies, stakeholder councils, and non-government organizations; 4 media press releases (that generated at least 6 newspaper articles statewide); and email subscriber announcements to over 16,000 interested individuals and organizations. Coordination meetings between Department staff and federal agency representatives from local district offices provided another opportunity to engage partners in the CWCS development.

Among the 4 Wildlife Summit workshops held in October 2004 (2 in Phoenix and 1 each in Flagstaff and Tucson), 54 participating constituents provided initial input into developing major components of the CWCS. Summit participants provided 119 individual comments during group discussions of Department general challenges, funding allocations among challenges, ranking important stressors/threats to wildlife and wildlife habitat, and proposing criteria for identifying Wildlife of Greatest Conservation Need (Gunn 2005a). An additional 418 constituents participated in an online Wildlife Summit survey, conducted between November 15 and December 6, 2004 (note: 256 of these participants completed the entire survey). Online survey participants provide 183 comments on the CWCS and related wildlife issues in Arizona (Gunn 2005b).

Forty-two constituents participated in a series of 8 public meetings on the CWCS draft plan, held statewide in late April and early May 2005. These participants provided 110 comments on the CWCS. An additional 52 CWCS-related comments were received through the Department's website between July 2004 and May 2005. Twelve comments were also received through correspondence with the Department's CWCS Planner or at Department-hosted events during this same timeframe.

ARIZONA'S WILDLIFE AND LANDSCAPES

SPECIES OF CONSERVATION PRIORITY (ELEMENT 1)

For Element 1 of Arizona's CWCS, the Ecoregion Workgroup identified wildlife of conservation priority—described nationally as “Wildlife of Greatest Conservation Need.” For the CWCS to be truly comprehensive for managing Arizona's wildlife, the Department must address the full array of wildlife in the state—game species, nongame species, sport fish, natives, and exotics. Species of conservation priority in the CWCS should be representative of the diversity and health of the State's wildlife populations.

The CWCS Processes (Companion Document A) describes the process used to evaluate the State's wildlife for high conservation priority. Specific criteria were adapted from: a list of concepts to consider by the Teaming With Wildlife Committee (TWW 2003d); stakeholder input through Arizona's Wildlife Summit workshops (Gunn 2005a); an online summit survey (Gunn

2005b); Department staff; external land management and natural resource regulatory agencies; and tribes. Seventeen separate criteria were identified—which are grouped under 5 larger categories (Table A) to evaluate species priority for conservation.

Table A. Categories for describing conservation status of all species in Arizona. Species were rated using the associated criteria under each category.	
Category: Community Focal	Keystone and strongly interactive species: wildlife that play a greater role in ecosystem functions
	Home range size: wide ranging or migratory species
	Habitat quality indicators: species presence or absence in a community represents the health of that habitat
Category: Responsibility	Responsibility status: all or most of the species global population occurs in Arizona; may be locally abundant, but at risk to a particular stressor/threat
	Administrative protection status on tribal lands in Arizona
	Administrative protection status in Mexico
Category: Vulnerability	Federal or state legal status: listed or proposed in the ESA and the State’s <i>Wildlife of Special Concern in AZ</i> (includes USFS-BLM sensitive species)
	Extirpated status: no wild populations in a previously occupied location
	Imperiled status: IUCN global rank
	Declining status: decrease in population size over time
	Disjunct status: geographically isolated from larger populations
	Demographic status: species that at some time during their life history are particularly vulnerable to certain stressors (long gestation or growth periods, poor recruitment into the population, poor genetic fitness, etc.)
	Concentration status: congregated in one or more areas annually
	Element occurrence: Natural Heritage Program state rank (includes endemic species—those found in only a particular location)
Fragmentation status: wildlife populations separated by barriers or fragmented habitat that are unable to effectively interact or mate	
Category: Social or Economic Value	Social or economic value: wildlife valued for hunting, fishing, watchable wildlife, pollinators, and state/national symbols
Category: Data Sufficiency	All criteria used to score “Vulnerability” category—species which there is not sufficient information to appropriately determine their population status

Wildlife Summit participants also suggested that “future threats to wildlife and natural habitats” and “potential for recovery and conservation success” are factors that should be considered in identifying wildlife of conservation priority (Gunn 2005a, 2005b). Rather than use these as criteria for prioritizing species, the Department chose to consider future threats and potential for success in formulating CWCS conservation strategies and in future operational plans and funding decisions.

The Department manages species at either the species or subspecies level, depending on various factors such as: legal requirements and protections, interagency coordination, stakeholder concerns, funding eligibility, national or international reporting conventions, and/or taxonomic determinations through scientific documentation. Counts of wildlife for Arizona’s CWCS may therefore not correspond exactly to counts on other Department species lists or narratives.

Table B provides a summary of how many wildlife species per taxon group that were identified as priority for conservation in Arizona. The list of wildlife of conservation priority per ecoregion can be found in the CWCS State of the State (Companion Document B: Appendix A).

Table B. Number of wildlife species in Arizona that ranked as high priority among 4 evaluation categories in 2005.

	Total in Arizona ^A	Total Priority ^B	Vulnerable	Responsible	Community Focal	Social / Economic
Amphibians	31	23	16	7	9	4
Birds	396	352	138	9	294	102
Fish	72	49	35	21	33	17
Crustaceans & Mollusks	85	29	29	24	25	0
Mammals	166	115	72	44	39	34
Reptiles	143	79	58	16	6	20
Total	893	647	348	121	406	177

^A: Of the 893 taxa (vertebrates, crustaceans, and mollusks) in the master list, how many in each taxon

^B: "Priority taxa" here do not include those only identified using the 'Data Sufficiency' criterion.

Note: Other macroinvertebrates not evaluated at this time due to insufficient data.

A total of 221 species were identified in the Data Sufficiency category: 99 birds, 55 crustaceans and mollusks, 52 mammals, and 15 reptiles (there were no amphibians or fish identified in this category). An improved understanding of the status of these species is desirable to fully understand their management needs. The list of wildlife of under this category can be found in the CWCS State of the State (Companion Document B: Appendix B).

The species criteria evaluation process was designed to be flexible in regards to funding opportunities, legal requirements, and priorities of the Department, partners, and constituents. For this reason, a large subset of identified wildlife of conservation priority was expected, and needed, to allow flexibility in using various funding sources.

HABITAT REQUIREMENTS AND INFORMATION NEEDS FOR PRIORITY SPECIES (ELEMENT 2 & 3)

Currently, the Department does not have detailed habitat requirements for all priority species. A majority of research and surveys of wildlife in Arizona lack detailed information on habitat needs (or thresholds) for survival. Instead, many species accounts that are available only identify suitable or preferred habitats.

Arizona's Natural Heritage Program is part of a global network of 80+ conservation data centers and programs associated with NatureServe. The Natural Heritage Program—used by Department partners, constituents, and the general public as a resource for information on species of concern—is the most logical place to document species abundance, distribution, habitat needs, and associated stressor/threat information. Arizona's Heritage Database Management System (HDMS) abstracts for Arizona wildlife are available through the Department website (http://azgfd.gov/w_c/edits/species_concern.shtml). At this time, approximately a third of all Arizona CWCS priority species have written HDMS abstracts. Unfortunately, some of these

abstracts and related GIS data are outdated, but new and updated abstracts are being added to the HDMS each month. The Department is in the process of hiring a wildlife diversity review biologist to increase the development of new HDMS abstracts and oversee the updates of existing abstracts.

Additional information on the status and distribution of Arizona's wildlife are documented in hundreds of existing technical reports developed by the Department's Research Branch and Nongame and Endangered Wildlife Program, as well as game management surveys by the Department's regional offices and Game Branch. Department staff also used published literature and external species occurrence resources to document wildlife abundance and distribution in Arizona. In developing the CWCS master species list of wildlife in Arizona, taxon leads and species experts identified which ecoregions and landscapes that crustaceans, mollusks, and vertebrate species used or resided in. This information is compiled in a Microsoft Excel spreadsheet that will be converted into a relational database and GIS layer. Other macroinvertebrates will be assessed in a later iteration of the CWCS, when more information on their occurrence and status is available.

A MULTI-SCALE APPROACH FOR CONSERVATION

To facilitate conservation of many species acting at different scales, Arizona's CWCS uses a multi-scale approach to classifying landscapes within Arizona. Specifically, there are 4 levels of classification:

1. **Statewide:** Coarse scale to address issues that are ubiquitous throughout Arizona.
2. **Ecoregion:** Wide, regional collections of species and the resources upon which they depend. Ecoregions are an ideal scale for cooperating with neighboring states and sovereign nations on broad conservation efforts. There are 6 identified ecoregions for Arizona's CWCS:
 - Apache Highlands North
 - Apache Highlands South
 - Sonoran Desert
 - Mohave Desert
 - Colorado Plateau
 - Arizona-New Mexico Mountains
3. **Landscapes:** Based on the 14 vegetation communities (Fig. 1) identified by Brown and Lowe (1974), and 3 riparian/aquatic systems (Fig. 2). This level addresses issues to wildlife that live in similar habitats or communities.
4. **Site Specific:** Fine scale for the conservation of species with very specific habitat needs. This level also captures specific landscape features (such as snags, nesting cavities, or caves) that are necessary for the well being of many species.

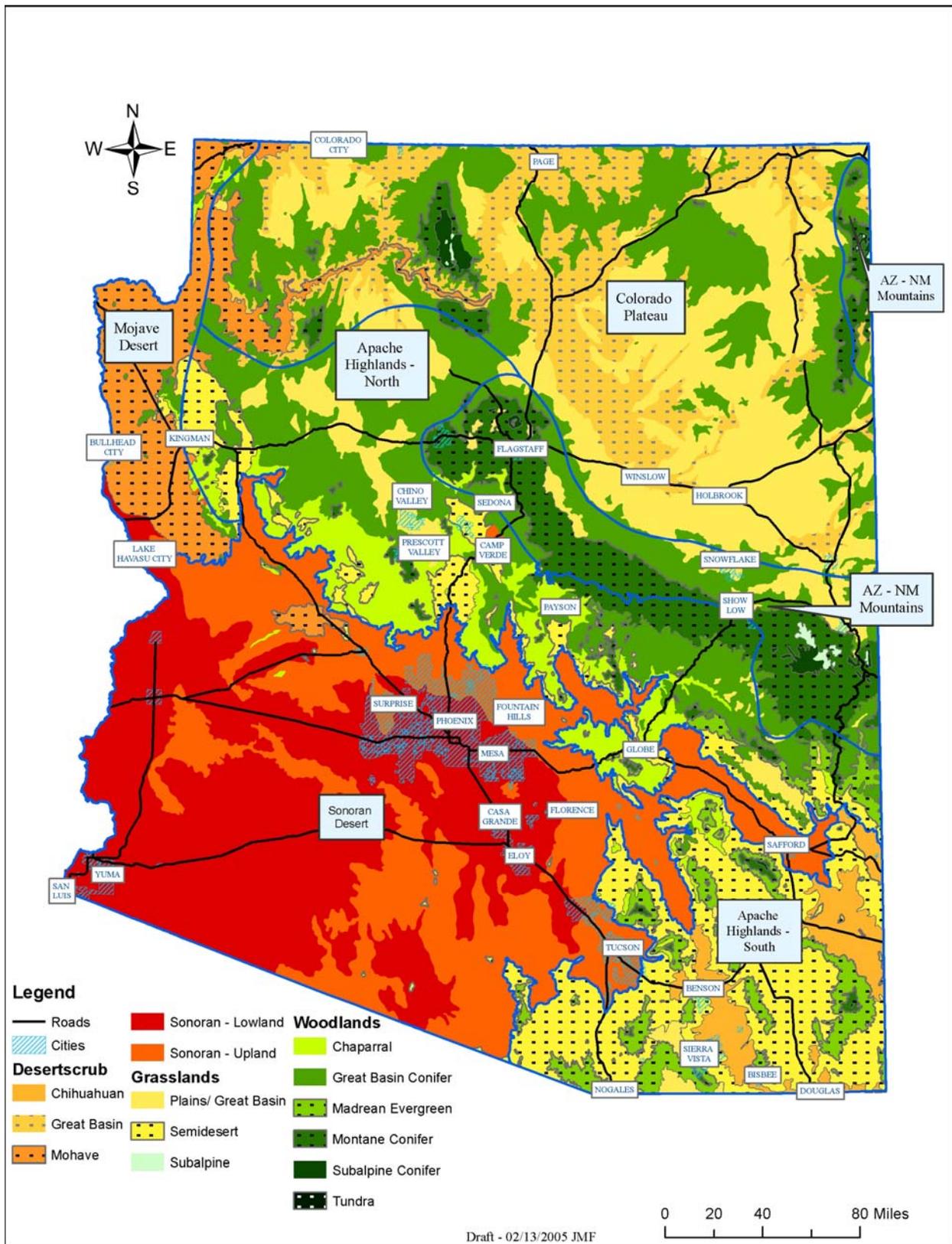


Figure 1. Vegetative communities and ecoregions identified in Arizona's CWCS.

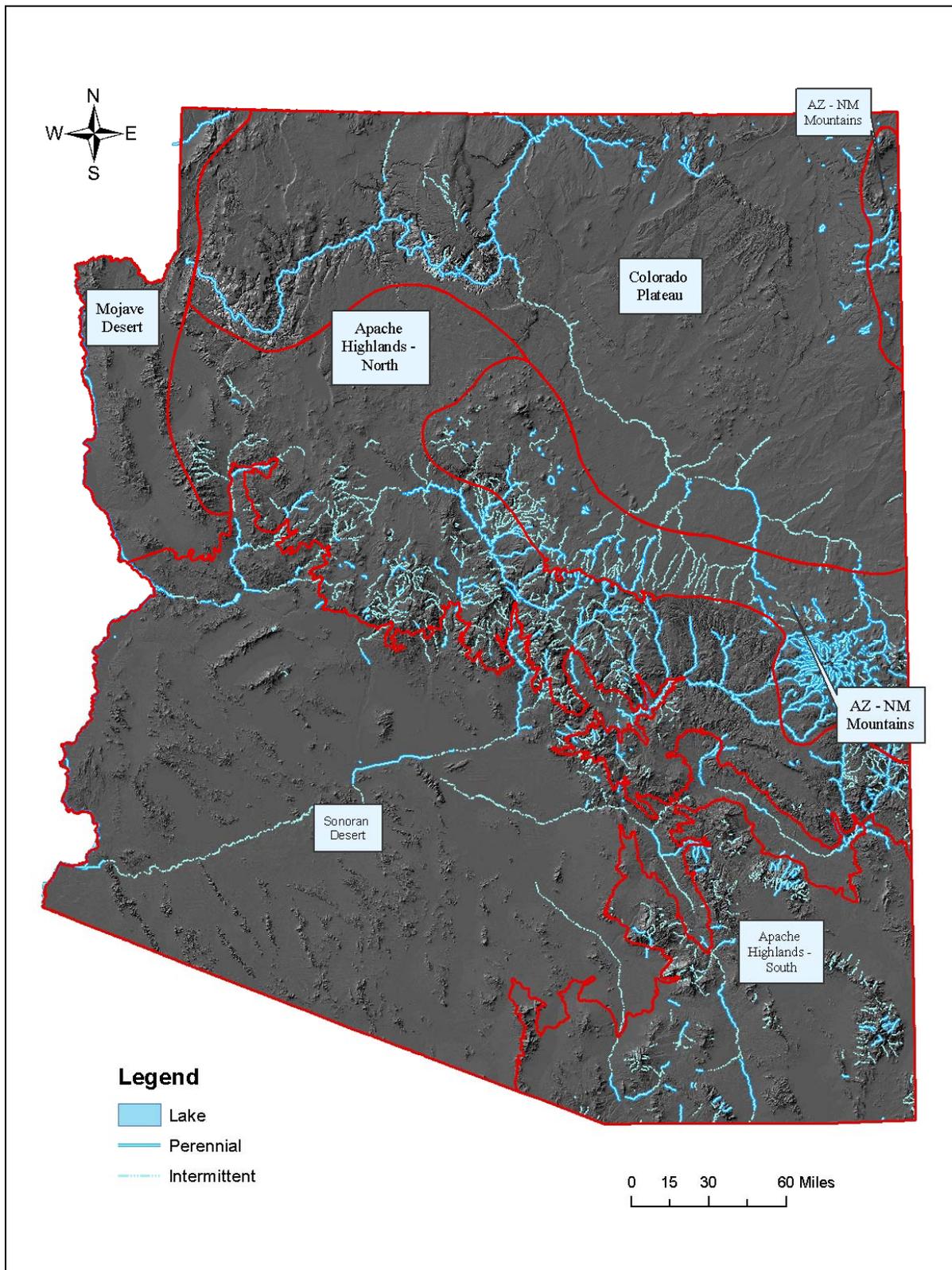


Figure 2. Riparian/aquatic systems and ecoregions identified in Arizona's CWCS.

IDENTIFYING STRESSORS/THREATS TO ARIZONA'S WILDLIFE (ELEMENT 3)

Over the past 500 years the landscapes of Arizona have changed dramatically. If one travels across Arizona today it is unlikely that they would find anywhere that has not been affected by man. Dams have been placed on rivers, developed urban and rural areas have increased in size, roads and fences were built throughout the state, and plant communities have been drastically altered. All of these changes have come at a cost to wildlife.

It is not the intent of the CWCS plan to debate the benefits and detriments of historical activities on Arizona's landscapes. One must look at the landscapes as they exist today and develop plans on how best to make meaningful improvements to benefit wildlife, especially those in greatest conservation need. The Department recognizes that many human activities across today's landscapes have the potential to be either beneficial or detrimental to wildlife. Many stressors/threats are based on legal and accepted practices, national security actions, or for public safety purposes. Therefore, the stressors/threats identified in this section are meant to only include those practices that are harmful to wildlife at certain levels of use or extent. It should be understood that it is the manner in which a human activity or practice is conducted that determines if it has a negative or positive effect on wildlife populations. For example, forest and woodland management can be a valuable tool to improve wildlife habitat, or if that management is applied in a wildlife-unfriendly manner it can be detrimental to wildlife.

To develop a list of potential stressors/threats to wildlife and wildlife habitats in Arizona, Department staff adapted conventions that are being used in other states (CMP 2004a) for describing categories and classes of threats. The Department worked with state, federal, and tribal partners to conduct a detailed threat assessment for the CWCS to identify and evaluate a list of stressors/threats specific to wildlife resources in Arizona.

In this assessment, landscapes were used as a surrogate for wildlife in evaluating important stressors/threats. Terrestrial and aquatic landscapes contain habitats and other resources that support wildlife communities and populations of rare or at risk species. A description of the process used for this assessment and evaluation of important stressors/threats to Arizona's wildlife and wildlife habitats can be found in the CWCS Processes (Companion Document A).

The following threat categories and classes are a subset of the threats identified during the Ecoregion Workgroup's threat assessment (Table C). For a full list of stressors/threats evaluated refer to Table F in the CWCS Processes (Companion Document A). Stressors/threats were evaluated at both the ecoregion and landscape (vegetative community and riparian/aquatic system) scales.

Many stressors/threats identified in the CWCS have a historical legacy and their present influence on current resources and stakeholder values should be viewed in context. The Department has a multi-use policy in regards to its mission and interacting with various land managers (AGFC 1991).

Table C. Threat categories and classes used for Arizona's CWCS (modified from CMP 2004a).

Threat Category	Threat Class
Habitat Conversion - Intentional conversion of natural habitat that is detrimental to wildlife use and survival by causing loss or degradation of wildlife habitat and available forage.	Housing and urban development
	Agricultural operations
	Recreation areas
	Destructive resource harvesting
	Management of nature to improve human welfare
Transportation and Infrastructure - Development of corridors/passages for transportation use, movement of resources, and relaying communications that increases wildlife mortality and fragmentation of wildlife habitat.	Roads
	Railroads
	Overhead utility lines and towers
Abiotic Resource Use – Extraction or use of rock, minerals, metals, fuels, and water that causes direct or indirect negative impacts to wildlife habitats.	Drilling
	Mining
	Water use
Consumptive Use of Biological Resources – Harvest or use of plant and animal populations in a manner that negatively impacts wildlife distribution and fitness, or ecosystem processes.	Gathering
	Forest and woodland management
	Grazing
Non-consumptive Resource Use – Activities that have an incidental, but negative impact to wildlife or their habitats.	Motor-powered recreation
	Non-motorized recreation
Pollution - Introduction and spread of unwanted matter and energy into ecosystems from point and non-point sources that causes increased mortality of wildlife and degradation of their habitats and available forage.	Chemicals and toxins
	Nutrient loads
	Solid waste
	Waste or residual materials
	Noise from low-level flights
Invasive Species - Introduction and/or spread of unwanted exotic and native organisms into ecosystems outside their natural range that increases wildlife predation, competition, and reduced fitness or loss of wildlife habitat and available forage.	Invasive plants
	Invasive animals
	Pathogens
	Introduced genetic material
Changes in Ecological Processes - Alteration of ecological processes outside of the natural range of variation, to the detriment of wildlife and their habitats.	Habitat-wide processes
	Species-linked processes

CONSERVATION STRATEGIES FOR ARIZONA'S CWCS (ELEMENT 4)

Based on the Ecoregion Workgroup's set of hundreds of potential conservation actions and opportunities that addressed important stressors/threats in Arizona, Department staff developed broad conservation strategies for the CWCS (Table D). Specific conservation actions and opportunities for the benefit of wildlife and wildlife habitat are considered where feasible and appropriate. Implementation of management actions is subject to necessary environmental compliance review (where required), and in cooperation with key land managers. Large-scale conservation efforts should be coordinated through interagency workgroups and formal agreements where applicable.

Table D. Conservation strategies for Arizona's CWCS. Implementation of specific actions is considered where appropriate and feasible, for the benefit of wildlife and wildlife habitat. Strategies are not presented in order of priority—all of these were identified as first-tier priorities for the CWCS.

Emphasis	Conservation Strategy
Conserving wildlife habitat	Promote the restoration and protection of aquifers, springs, streams, rivers, lakes, and riparian systems. Support regulations ensuring minimum instream flow and water rights for wildlife resources.
	Perform landscape classification analyses to identify sensitive habitats, core wildlife areas, and important wildlife corridors.
	Acquire ecologically important lands, access agreements, conservation easements, and/or water rights.
	Support State planning efforts to address drought issues as they relate to wildlife resources.
Maintaining and re-establishing habitat and landscape connectivity	Promote maintenance and restoration of habitat connectivity by removing or modifying barriers, protecting corridors and riparian areas, and using wildlife-friendly roadway crossing structures.
	Promote maintenance and restoration of habitat connectivity by removing unneeded fences, by using wildlife-friendly barriers in future projects and when replacing old fences.
	Develop standards for new road, utility and power lines construction, and modification of existing structures and corridors to reduce impacts to wildlife.
Wildlife management	Promote implementation of recovery plans, habitat conservation plans, and other cooperative agreements for sustaining wildlife resources. Develop plans to conserve priority conservation species (Focal Community; Responsibility, and Vulnerability categories) that are not sufficiently addressed under existing plans.
	Manage so as to sustain or enhance sport fish and native fish populations.
	Develop contingency plans for rapid salvage of wildlife populations threatened with extirpation in situations of imminent habitat loss.
	Maintain and construct new wildlife water developments. Encourage conversion of livestock waters so they are also continuously usable by wildlife.
	Collaborate with partners to evaluate sampling techniques, reduce duplication of effort, and develop pathogen decontamination protocols to limit impacts to wildlife.
	Collaborate with partners on disease/pathogen/parasite issues to wildlife including: development of action plans to manage existing sources, identify and respond to new threats, and to educate the public.
	Evaluate, update, and enforce existing Department regulations to address evolving concerns about hybridization, nuisance animals, illegal stocking, and spread of animals used for bait.
	Reduce/eliminate the effects of feral animal populations in sensitive habitats or near wildlife populations of concern.
Public education and law enforcement to benefit wildlife and wildlife habitat	Educate the public about the impacts of free-ranging or feral animals, release of exotic species, and illegal stocking of fish and live bait on wildlife resources. Increase enforcement of existing laws and promote more stringent laws prohibiting the release of domestic or exotic animals into the wild.
	Utilize education and enforcement to promote human behavior that does not encourage wildlife to become a nuisance (for example: feeding wildlife, securing waste containers, and storage of food). Increase awareness of effects of feeding and litter on wildlife.
	Increase public awareness of how water conservation and ensuring instream flow can benefit wildlife.
	Encourage the use of low water-use native plants in landscaping.
	Educate the public regarding identification of contaminants, release prevention, and impacts to wildlife and habitats. Promote alternatives that reduce release of contaminants.
Encourage cooperative clean up efforts of wildlife habitats.	

Table D. Conservation strategies for Arizona’s CWCS. Implementation of specific actions is considered where appropriate and feasible, for the benefit of wildlife and wildlife habitat. Strategies are not presented in order of priority—all of these were identified as first-tier priorities for the CWCS.

Emphasis	Conservation Strategy
Public education and law enforcement to benefit wildlife and wildlife habitat	Increase public awareness of the potential effects of various types of recreation on wildlife resources. Encourage responsible outdoor recreation through education (for example: “Stay on the Trails,” “Leave No Trace,” “Be Bear Aware,” “Stop Aquatic Hitchhikers”), enforce existing laws, and encourage development of new legislation.
	Inform the public and land management agencies on the effects of illegal harvest of wildlife. Cooperate with land management agencies to increase enforcement of existing laws.
	Support prevention and suppression of accidental or arson-caused wildfire through information and education and enforcement of appropriate regulations.
	Educate the public on the importance of community focal species (including predators, prey, wide-ranging species, keystone species, etc.) for ecosystem health.
Representing wildlife values in multiple-use planning	Provide recommendations to state and federal partners on the development of new land management plans or revising existing plans as they relate to wildlife resources.
	Cooperate with state, federal, tribal, and local government partners to develop and implement watershed management plans that incorporate wildlife and habitat values.
	Prevent loss and degradation of sensitive habitats through involvement of planning efforts with local governments, private landowners, and agency/tribal land managers.
	Promote restoration of natural fire regimes for improving grassland and forest health.
	Promote adoption of sustainable forage management standards and guidelines for livestock and wildlife.
	Promote conservation of sensitive areas and habitats for wildlife.
	Encourage development and implementation of standards and guidelines for mining and landfill operations that consider the needs of wildlife resources.
	Encourage land management agencies to manage road and trail networks to ensure sustainable wildlife resources in balance with recreational opportunities, economic pursuits, and rural development.
Representing wildlife values in other processes	Coordinate to reduce impacts to wildlife along the US-Mexico border.
	Encourage the operation of dams, canals, and diversions for improving or maintaining wildlife resources. Promote wildlife values in building new, renovating existing, or removing old water retaining structures.
	Promote programs for eliminating or limiting the spread of invasive plants and animals, and the recovery or reintroduction of native populations.
	Limit the spread of invasive plants and promote the restoration of native vegetation in disturbed areas.
	Support land management and regulatory agencies in enforcing Best Management Practices to prevent the introduction of toxins into ecosystems.
	Promote the use of engineered wetlands, discharge basins, and augmented riparian vegetation to pre-treat water prior to release into riparian systems. Promote the use of treated effluent to create wildlife habitat.
	Cooperate with land management agencies and municipalities on revising waste management plans to minimize impacts to wildlife resources.

Due to the comprehensive nature of the CWCS, many of the proposed strategies are included for the benefit of the Department’s external partners and land managers, who will be the likely leads

for implementing conservation activities. In many proposed strategies, the Department may participate in an advisory and technical capacity in assisting land managers; in other strategies, the Department may be the lead for those activities over which it has direct authority.

INFORMATION NEEDS FOR ARIZONA'S CWCS (ELEMENT 3)

Concurrent with identifying conservation actions and opportunities, the Ecoregion Workgroup also identified potential barriers to effectively addressing important stressors/threats to wildlife and wildlife habitats. Many of these barriers were compiled as "information needs" (Table E).

Emphasis	Information Needs
Determine status and distribution	Determine distribution and population status of priority and nuisance species.
	Determine habitat requirements for species of conservation priority and develop models of their habitat use.
	Map the distribution of landscape features including: barriers to wildlife movement; areas of high human disturbance; high fuel load areas; important wildlife corridors; migration pathways; structures, sites and activities causing soil erosion; other structures; baseline vegetation; and vegetation changes.
Compile data, programs and information	Compile wildlife-related data, programs, and information such as: the Arizona Department of Transportation database of roadside invasive plants, pertinent wildlife studies, Florida's wildlife-friendly road crossing designs, etc.
Research species biology	Develop genetic analyses on species of taxonomic uncertainty.
	Investigate features of species' biology that are of conservation concern. For example, understand characteristics that make particular species more invasive, other species important keystone species, or other species more sensitive to stressors such as long-term drought.
Research ecosystem conditions	Generate projections of future conditions and model past conditions related to land conversion, water usage, species re/introductions, dam removal, road building, management actions, etc.
	Develop GIS models to assess the impacts on wildlife and wildlife habitat from the presence of human activities and structures.
	Investigate functional mechanisms and conditions that affect shifts in ecosystem states. These mechanisms and conditions may be related to priority species and/or identified stressors.
	Implement adaptive management principles for large-scale projects. Treat these projects as experiments in order to extract the most information and conservation benefit.
Research stressors/threats	Determine threats to vulnerable species.
	Research impacts of specific threats and activities on wildlife resources.
	Model, monitor, and research factors related to wildlife and wildlife diseases.
	Characterize non-point sources of identified stressors/threats.
Develop conservation, research, and monitoring tools	Develop a process or processes to identify and prioritize significant habitats for short- and long-term conservation planning.
	Work with cooperators to develop research standards and methods to assess or address impacts from particular stressors.
	Investigate and develop alternatives for non-conservation projects and activities such as dam releases, road construction, and utility towers, so that these projects have less impact on wildlife and wildlife habitats.
	Establish monitoring programs and develop best monitoring techniques.
	Rank alternative conservation tools, identifying best and worst alternatives. Encourage development and use of wildlife friendly techniques.

LANDSCAPES OF GREATEST CONSERVATION NEED (ELEMENT 2)

Due to time constraints and numerous data gaps, the Department did not initiate a statewide comprehensive habitat analysis for the CWCS. This task will need to be completed in the near future as new data on Arizona's wildlife resources is compiled. As a first approximation of identifying the locations of key habitat for priority species, the Department identified which ecoregions support each species (CWCS Companion Document B, Appendices A and B).

In the meantime, the Department has identified 2 sources of information to be used in lieu of a comprehensive statewide landscape analysis. The first is the 147 conservation priority areas in Arizona identified in ecoregional analyses (TNC 2004, 2005; www.azconservation.org) by the Nature Conservancy (TNC) in collaboration with the Department, numerous land managers, resource agencies, species experts, and international cooperators. The resulting map (Fig. 3) shows areas with the greatest strategic value for protecting ecosystems and viable populations of native species of animals and plants. The second effort, known as the Arizona Wildlife Habitat Linkages—a partnership of federal, state, university, and non-governmental organizations—is developing a statewide map identifying wildlife movement corridors between core habitat areas. The draft Linkages map (Fig. 4) is intended to provide a visual tool to guide future planning, engineering, and mitigation strategies for public roadway construction and renovation and expansion of rural and urban communities. Together, these efforts provide insight into where large assemblages of various species occur and delineate areas of high conservation priority.

Both TNC conservation areas and the Arizona Wildlife Habitat Linkages provide useful proxies for statewide habitat analyses, but each has design limitations that do not fully meet the needs of the CWCS. TNC conservation areas identify priority locations for protecting the full array of native species and ecosystems, using a regional approach that extends beyond the state's borders in all directions. These analyses were based on the distribution of 270 animal species within Arizona, representing game and nongame species, rare and common, wide-ranging and local endemics, and community focal species. They also were based on the distribution of all vegetative communities and a variety of native plants species, but did not consider non-native fish and game species. TNC conservation areas do not identify many public lands as priorities for conservation—lands that the Department considers important wildlife habitat. Not being a major landowner, the Department must rely upon federal, state, tribal, local government, and private landowners to manage their respective lands to support sustainable wildlife populations. In contrast to the TNC conservation areas, the Arizona Wildlife Habitat Linkages effort identifies areas within Arizona that are necessary to maintain habitat connectivity. As such, this effort considers most land within the State to be wildlife habitat. However, the current design of the Arizona Wildlife Habitat Linkages effort does not identify particularly sensitive or threatened habitat. For the CWCS, the Department plans to expand on both of these efforts in the future.

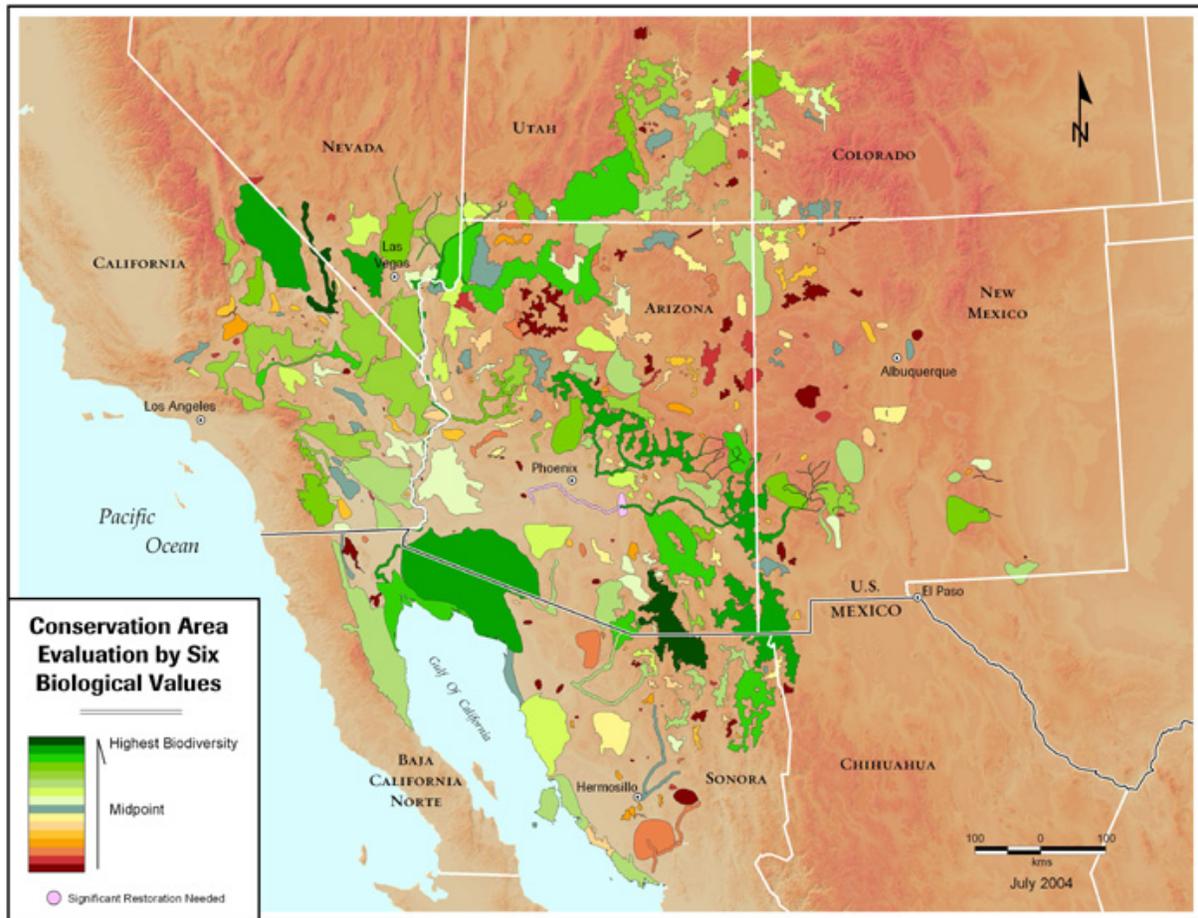


Figure 3. TNC Conservation Areas identified for ecoregions in Arizona and extending into neighboring states, tribes, and Mexico. Six biological values were used to identify conservation areas in this assessment: 1) plant and animal species occurring at each location; 2) species present that are globally rare (IUCN ranks of G1/G2); 3) species present that are federally listed as endangered or threatened; 4) species present that are endemic (90% of their range is found within 1 of 5 ecoregions analyzed); 5) taxonomic groups represented (birds, fish, mammals, invertebrates, reptiles, amphibians, and plants); and 6) aquatic/riparian species present.

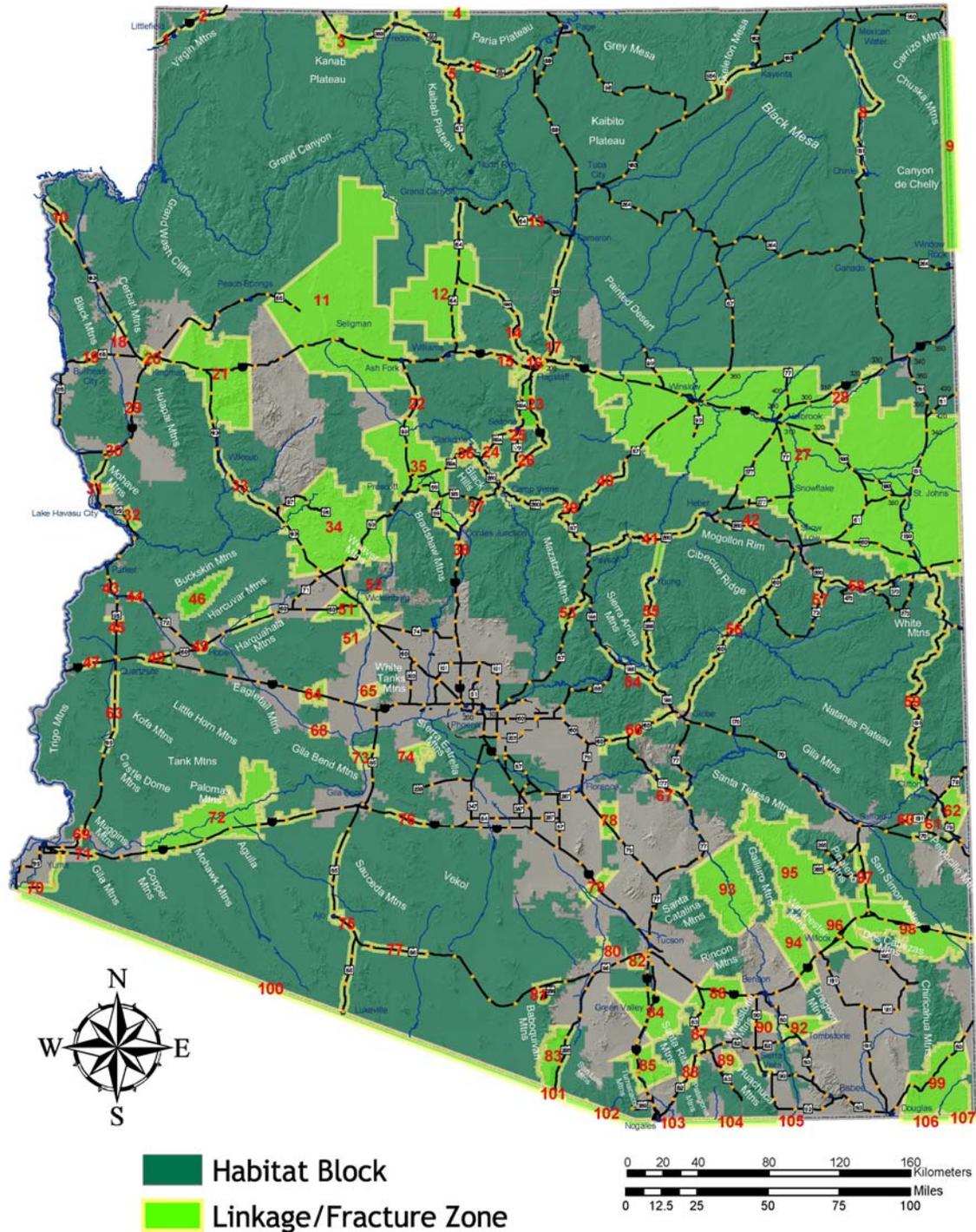


Figure 4. DRAFT Arizona Linkages map (May 16, 2005 version by S. Nordhaugen). The numbered Linkages / Fracture Zones are not in order of priority, but are identifiers associated with the map's GIS database. This product is still under revision.

There are several regional habitat analyses by non-governmental organizations, contractors, and local governments that offer additional information and recommendations on land use and planning in support of wildlife resources. Several regional land use analyses include: Sonoran Desert Conservation Plan (Pima County 2002); Sky Islands Wildlands Network (Foreman and others 2000); Wildlife Reference Document for Coconino County (Wildlife Workgroup 2003); Sonoran Desert Network Inventory and Monitoring Program (Gebow and others 2004); Mohave County General Plan (Mohave County 1995); Grand Canyon Wildlands Network (Grand Canyon Wildlands Council 2004); and the Integrated Natural Resources Management Plan and Environmental Assessment 2001-2005: U.S. Army Intelligence Center and Fort Huachuca (Trousil 2001). These resources are examples of local or fine-scale approaches to identifying important biotic communities and habitat linkages, and many have built their efforts on partnerships with many stakeholders and scientists.

In addition, there resources available for improving land use planning coordination among stakeholders, private landowners, and local communities—for example: Landscapes, Wildlife, and People: a Community Workbook for Habitat Conservation (Stark and Cestero 2001); and The Planning for Results Guidebook (Nellis and Van Gilder 2003).

IMPLEMENTING THE CWCS (ELEMENT 5)

The CWCS processes provide the first tier of prioritization—grouping hundreds of potential actions and opportunities under broad, partner-based conservation strategies. Within the Department, strategies will then be prioritized within each of the 4 Department programs: Wildlife Management, Watercraft, Off-Highway Vehicle, and Business Administration. Before this strategic level of planning is finalized, it undergoes review and approval by the Arizona Game and Fish Commission. Once adopted, conservation and information strategies will be used for operational planning, the second tier of the Department's approved 3-tier planning process (AGFD 2004). The 4 Department programs pass approved strategies to the following 6 focal areas within each program: Conservation, Recreation, Information and Education, Laws and Law Enforcement, Research, and Administration. In the third tier of planning, individual work units develop annual Implementation Plans.

Concurrently, the priorities of CWCS partners and land managers among the set of strategies and information needs in the CWCS will need to be assessed. This effort will better identify key agencies, non-government organizations, and landowners that would be willing to take the lead on implementing specific conservation actions (note: Appendix G in the CWCS Processes—Companion Document A recommends key partners for implementing each strategy, but does not imply commitment of any specific entity to those tasks).

For the Department and its partners, the next step for the CWCS is developing metrics, or performance indicators, for conservation strategies listed in Table D. A similar set of measurements will be needed for the information needs identified in Table E. Some strategic-level metrics can be derived from the hundreds of potential conservation actions and opportunities that were brainstormed during previous Ecoregion Workgroup meetings and

CWCS development team sessions in late 2004 and early 2005. Conceptual ideas and recommended references are available through a number of new and existing documents: CWCS Monitoring and Evaluation (TWW 2005); Habitat Monitoring: an Approach for Reporting Status and Trends for State Comprehensive Wildlife Conservation Strategies (Schoonmaker and Luscombe 2005); Proposed Taxonomy of Conservation Actions (CMP 2004b); the USFS Multi-Species Inventory and Monitoring Protocol (USFS 2004); Sonoran Desert Network Inventory and Monitoring Program (Gebow and others 2004); and Partners in Flight North American Landbird Conservation Plan (Rich and others 2004).

Additional CWCS Ecoregion Workgroup meetings will need to be convened with Department partners and other stakeholders to define quantifiable performance measures and identify partner priorities among the list of conservation strategies and information needs. The Department's Nongame and Endangered Wildlife Program is in the process of developing taxon-based management plans, similar to the efforts already completed for bird species with the Arizona Partners In Flight Conservation Plan (Latta and others 1999) and for bats in the Arizona Bat Conservation Strategic Plan (Hinman and Snow 2003). These taxon-based plans are envisioned as implementation plans, bridging the strategic goals of the CWCS with the operational activities and stakeholder responsibilities identified in numerous recovery plans, conservation agreements, and other partnership-designed initiatives and agreements.

The following are a subset of performance measures adapted from Rich and others (2004) to evaluate effectiveness of an adaptive conservation approach, which could be incorporated in Arizona's CWCS:

- Population monitoring;
- Number of priority species in the "Vulnerable" category;
- Number of "Vulnerable" category priority species on track for meeting 30-year population objectives;
- Number of habitat improvement projects initiated;
- Number of hectares of habitat considered protected and restored, by ecoregion and landscape type;
- Number of priority species remaining in "Data Sufficiency" category;
- Number of technical report and peer-reviewed research publications addressing priority conservation issues;
- Number of agreements in place to meet wildlife population and habitat objectives;
- Number of land management and regulatory agency plans into which Arizona CWCS objectives have been incorporated.

In order to fill gaps in existing monitoring projects and to implement best monitoring practices, the Department will want to coordinate monitoring projects with external, existing programs such as: the North American Bird Conservation Initiative (NABCI; www.nabci-us.org), the North American Bat Conservation Plan (www.batcon.org/nabcp/newsite/rwg.html), Partners in Amphibian and Reptile Conservation (PARC; www.parcplace.org), The Wildlands Project (www.twp.org), Pima County's Sonoran Desert Conservation Plan (www.pima.gov/sdcp), and the Central Arizona-Phoenix Long-Term Ecological Research project (www.capter.asu.edu). Many of these initiatives have been further developed for application in Arizona (Latta and

others 1999; Foreman and others 2000; Pima County 2002; Hinman and Snow 2003; Grand Canyon Wildlands Council 2004 draft). Species selected as targets of monitoring should represent priority species from the perspective of regional responsibility, vulnerability, ecosystem function, and/or social/economic importance. A subset of these species across the range of taxa and in each category should be monitored to report on the effectiveness of the CWCS in conserving wildlife populations.

ARIZONA'S CWCS DATABASE

A relational database is being developed that will facilitate planning, monitoring, and evaluation of conservation actions implemented under the CWCS. The CWCS database will function as a communication tool among Department work units, and become the centralized place to store the data used to drive conservation actions. In its present form, the database consists of a number of related tables linking existing recovery plans and teams to species, threats, strategies, partners, and landscapes addressed in the plan. A user-friendly form incorporates a number of drop-down menus to query the data by priority species, stressor, partners, conservation strategies, or ecoregions. This database could be linked to other Department databases that serve as archives for project evaluations, planning resources, and reporting project activities for fiscal and performance reports. In addition, the Department is improving its ArcIMS® capability for public-accessible GIS data through its website. It is anticipated that the CWCS database will be tied into ArcIMS® allowing external users to click on specific areas of a statewide map and learn about various operational plans or agreements, priority species, local stressors/threats, wildlife corridors and core areas, habitats of conservation need, and conservation actions and partners involved within that area's proximity.

ADAPTIVE MANAGEMENT AND THE CWCS (ELEMENT 5)

Adaptive management provides an experimental platform upon which to incorporate existing knowledge of the system into management activities while allowing enough flexibility to implement alternative management strategies (Walters 1997; Brown and Ford 2002). Feedback loops between monitoring and management actions can correct for the uncertainty that is inherent in managing complex systems (Stromberg 2001; Clark 2002; Williams 2003). These feedback loops between management activities and monitoring allow researchers and land managers to adjust for changing circumstances (environmental, political, economic, etc) thereby ensuring success in achieving conservation goals.

Adaptive management contains an inherent flexibility allowing for multiple conservation actions to be developed, weighed and exercised. Monitoring the effectiveness of those actions relies on a number of mechanisms. These mechanisms may include:

- 1) Coordination and cooperation with all involved parties (that is: stakeholders, sponsors, agencies, academia, media, and general public);
- 2) Knowledge of pertinent information gaps and uncertainties relevant to specific conservation actions;
- 3) Formulation of alternate conservation action endpoints to assist in project organization, efficiency, and budgeting;

- 4) Monitoring at all scales necessary to determine level of success or failure for those conservation actions implemented;
- 5) Flexibility to switch to alternate actions if thresholds are not met;
- 6) Publication of results of conservation actions in highly accessible form (preferably on-line in Adobe PDF format); and
- 7) Self-revising as feedback loops between monitoring and actions frequently update information.

Arizona's CWCS is not meant to be a fixed set of conservation goals and strategies. Rather, the CWCS is a series of processes that can be used to identify Department and partner priorities and appropriate monitoring efforts for wildlife and wildlife habitat on various spatial scales (statewide, ecoregion, landscape, or site specific).

REVISIONS TO THE CWCS WITHIN A 10-YR TIMEFRAME (ELEMENT 6)

Arizona's CWCS is scheduled to be reviewed and revised on a series of 2-yr and 4-yr cycles during its 10-yr timeframe (Table F). This review process will be synchronized with the Department's 2-year budget planning cycle that is approved by the State's Executive and Legislative branches. The Department will use its existing annual performance reports for Federal Aid projects and State Wildlife Grant funds to document progress on CWCS-related activities.

Table F. Schedule for CWCS review and revision aligned with the Department's budget cycle.											
FY05		FY06		FY07		FY08		FY09		FY10	
July-1-2004 to June-30-2005		July-1-2005 to June-30-2006		July-1-2006 to June-30-2007		July-1-2007 to June-30-2008		July-1-2008 to June-30-2009		July-1-2009 to June-30-2010	
Develop initial CWCS plan		Submit CWCS for approval in July 2005				Internal review - amend CWCS by Apr 2008				4-yr review partners / public in Feb 2010	
Budget process		2-yr budget process				2-yr budget process				Budget process	
CWCS 10-yr timeframe		Year 1		Year 2		Year 3		Year 4		Year 5	
FY11		FY12		FY13		FY14		FY15		FY16	
July-1-2010 to June-30-2011		July-1-2011 to June-30-2012		July-1-2012 to June-30-2013		July-1-2013 to June-30-2014		July-1-2014 to June-30-2015		July-1-2015 to June-30-2016	
		Internal review - amend CWCS by Apr 2012				4-yr review partners / public in Feb 2014				Internal review - amend CWCS by Apr 2016	
Budget process		2-yr budget process				2-yr budget process				Budget process	
Year 5	Year 6	Year 7		Year 8		Year 9		Year 10		Year 1	
Note: State fiscal year (FY) is not aligned with the Federal fiscal year (October 1 to September 30 of the following year). Each 2-yr budget cycle process starts in Spring of the second half of the fiscal year, with the proposed budget to the Commission in June, the State's Office of Strategic Planning and Budget review in August, and to the State Legislature in January of the next fiscal year.											

The Department will conduct an internal review of the CWCS prior to each 2-yr budget process to address changing priorities, variations in landscape and environmental conditions, and to adaptively manage based on wildlife and habitat responses to conservation actions or treatments.

Every 4 years, a detailed evaluation of CWCS will be done to assess progress on conservation strategies, species status, important stressors, and to solicit partner and public input. Critical partners and key stakeholders will be asked to participate in the 4-yr reviews with the Department's internal staff. These evaluations allow "mid-course" corrections within the anticipated 10-year timeframe of the CWCS.

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ACKNOWLEDGMENTS

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CWCS GLOSSARY OF TERMS

Abiotic Resource: non-living materials (for example: air, water, soil, minerals, fuels, wind, solar radiation).

Aboriginal: native or initial human occupants of a specific location.

Accidental or casual migrants: bird species that do not typically travel through or into a specific area (=outside their normal range, distribution, or migration routes).

Anadromous: species that reproduce in freshwater habitats and migrate to marine habitats to mature.

Biodiversity: a variety of plant and animal species within communities or ecosystems; includes genetic variants within a population and transient or migratory species.

Biotic Resource: living plant and animal species.

Candidate: a conservation status under the ESA where a species or population is potentially at risk of decline throughout all or a significant portion of its range (=proposed for listing as either threatened or endangered).

Community: an assemblage of species co-existing within a specific location.

Crustaceans: crayfish, shrimp, and amphipods (=scuds).

Ecoregion: a large area of land and water that is characterized by distinct plant communities, plant and animal species, and environmental conditions such as climate and landforms.

Ecosystem: a system of environmental conditions, habitats, and species that interact.

Endangered: 1) a conservation status under the ESA where a species is at risk of extinction throughout all or a significant portion of its range. 2) a condition where a species or population has a low probability of survival over time due to various stressors/threats and reduced population level or fitness.

Endemic: a species that is native to a specific location and occurs nowhere else.

Ephemeral: water flow or standing water that occurs seasonally within a drainage or area.

Extinct: a species that is no longer alive.

Extirpated: a species or population that is locally extinct, but continues to exist elsewhere.

Fauna: animal species or populations.

GLOSSARY CONTINUED

Feral: animals that were once domesticated (including their off-spring) but now are living wild.

Flora: plant species or populations.

Game species: those animals that are regulated for hunting or harvest.

Intermittent: water flow that irregularly occurs within a drainage or area (alternating between surface and subsurface flow).

Invasive: a plant or animal (either native or non-native) that under certain conditions significantly out-competes, displaces, or eliminates other species within a community.

Macroinvertebrate: animals without backbones (for example: insects, spiders, crustaceans, mollusks) that can be seen without magnification.

Mollusk: clams and snails.

Monotypic: a community or stand of vegetation that contains one species or type of vegetation.

Nuisance species: a species that is considered a pest or problem (typically unwanted or invasive). Under certain conditions, native or non-native species may be considered as "nuisance."

Perennial: water flow or standing water all year long within a drainage or area.

Precipitation: rain and snow.

Priority Species: those animals that rank high for at least one of the 4 species categories in the CWCS (Community Focal, Responsibility, Vulnerable, Social / Economic Value).

Sport fish: fish that are regulated for harvest by angling or other means.

Stressors/Threats: activities or conditions (human-caused or natural) that negatively affect the health and distribution of wildlife and vegetative communities.

Taxon/Taxa: classifications or groups of animals or plants that share similar evolutionary lineages, general body forms, life histories, and/or reproductive means (for example: there are 6 taxon groups of animals referenced in the CWCS—amphibians, birds, fish, invertebrates, mammals, and reptiles).

Threatened: 1) a conservation status under the ESA where a species is at risk of becoming endangered in the foreseeable future throughout all or a significant portion of its range. 2) a condition where a species or population has a medium to low probability of survival over time due to various stressors/threats and reduced population level or fitness.