

DRAFT Species and Habitat Conservation Guide
Arizona Game and Fish Department
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Interpretation of Species and Habitat Conservation Guide:

The Arizona Game and Fish Department's (Department) Species and Habitat Conservation Guide is intended to identify key habitats for wildlife conservation potential in Arizona at a landscape/statewide scale, ultimately guiding the Department's strategic wildlife goals and objectives. This analysis is also intended to guide project planners and developers at a statewide, landscape-level.

- This map is intended to guide the Department's wildlife and wildlife habitat conservation priorities and to inform project and development planning on a state-wide scale.
- Categorizations are not intended to replace environmental and land use permitting and/or the Department's ability to review site specific projects.
 - A comprehensive, project review to analyze site-specific impacts on wildlife and wildlife habitat is available from the Department's Project Evaluation Program.
 - Depending on project type and location, additional wildlife information (e.g. wildlife movement corridors, crucial seasonal habitat requirements, etc.) is available and should be considered in evaluating wildlife sensitivities.
- The Department does not regulate land use or permitting.
 - Categorization of areas does not represent a regulatory preclusion from future development, and is not intended to represent or convey regulatory or permitting authority.
- This product represents the current understanding of these areas as of this point in time, and is subject to continual refinement. The status of a wildlife resource can change quickly, and the availability of new data will necessitate the refinement of this assessment. Please contact the Department to acquire the most up-to-date information and maps.

Areas on the map are depicted using a color gradient to identify areas based on their potential. The darkest shades of blue indicate areas having the highest relative state-wide potential for wildlife conservation to the Department. The lightest shades of blue indicate areas having the lowest relative state-wide potential for wildlife conservation to the Department. Specific information on data sources, analysis, and weighting used to develop this model can be found below.

LAYERS USED TO BUILD THE SPECIES AND HABITAT CONSERVATION GUIDE:

Species of Economic and Recreational Importance (SERI):

This category represents 13 of Arizona's game species. The distribution of game species influences important aspects of wildlife related recreation. When evaluating the effects of changes to this distribution, the Department considers three aspects: demand for the game resource, revenue generated by the game resource for communities in Arizona, and the revenue generated by the game resource for the Department. Demand for the game resource provides an indication of how important a particular piece of habitat is to the hunters of Arizona for a given species and is represented by the number of first choice applicants divided by the available number of permits for that species. Areas with higher demand are likely to be more important to hunters than areas with lower demand. Revenue generated by the game resource for communities in Arizona provides an indication of the economic importance of a particular area and is represented by the measured hunter days multiplied by the value of a hunter day in purchases of goods and commodities (e.g., gas, food, motel). Areas with high value are used more frequently and provide a greater contribution to Arizona's economy than do areas with lower values. Finally, the license and tag revenue generated by the game resource provides an indication of how critical an area is economically to the Department. Together, the economic and recreational importance of game species to hunters, the community, and the Department provide a realistic view of the importance of game habitat.

Weighting – The following is a brief description of how the Department is analyzing these populations and their habitats in terms of importance: The SERI model was developed from distributions of 13 individual game species. Game species were weighted spatially based on 3 factors related to demand, economics, and revenue. Raw values were used for the three factors as the basis for weighting an individual species. The individual species' score represents its economic and recreational value relative to the other SERI species. Weights were also adjusted by species density measures where available, and assigned additional weights of 1 for low, 2 for medium, and 3 for high density. These were used to multiply the weights assigned on economic factors.

- Demand = First Choice Applicant's ÷ Permits Issued
- Revenue = (Tag + License cost) × Permits Issued/ sq mile
- Economic = Daily Expenditure × Hunter Days/ sq mile

The Species of Economic and Recreational Importance are added together to give a score for the 13 game species. That score is then added to the SGCN and Sportfish scores (described below) to arrive at a total score. SERI collectively are treated equal to SGCN's Tier1a collectively.

Species of Greatest Conservation Need (SGCN):

This category represents vulnerable species as defined in the State Wildlife Action Plan (SWAP). Criteria for the vulnerability classification can be found in Appendix L, page 144 within the SWAP at: http://www.azgfd.gov/pdfs/w_c/cwcs/downloads/CWCSAppendices.pdf.

Criteria for Tier 1a, 1b, and 1c Classifications

Tier 1a: Vulnerable species that match at least one of the following:

- Federally Listed Species (Threatened or Endangered)
- Candidate Species
- Require monitoring following Federal Delisting
- Species are protected under a signed Conservation Agreement

Tier 1b: Vulnerable species that match at least one of the following:

- Is Petitioned for Federal Listing (Threatened or Endangered)
- Is high priority in the Arizona Partners in Flight Bird Conservation Plan or occurs on any of the following species of special concerns lists:
 - Bureau of Land Management Sensitive Species
 - U.S. Forest Service Sensitive Species
 - National Park Service Sensitive Species
 - Pima County Priority Vulnerable Species
 - Trilateral Committee Species of Common Concern
 - Federal Species of Concern
 - Wildlife Species of Concern in Arizona

Tier 1c: Vulnerable species that match none of the above criteria.

Weighting – The following is a brief description of how the Department is analyzing species diversity in terms of importance: The SGCN model was developed by combining individual species distributions into richness values for Tier 1a, Tier 1b, and Tier 1c species. Those richness values were weighted according to tier where:

$$\text{Score} = (\text{Tier1a} \times 3) + (\text{Tier1b} \times 2) + \text{Tier1c}$$

Sportfish:

Sport fishing is a significant contributor to Arizona's outdoor recreation and economy with close to 400,000 anglers expending 5 million angler days, creating \$1.3 billion in economic value to the state annually.

Weighting – The following is a brief description of how the Department is analyzing these populations and their habitats in terms of importance: Sportfish are weighted from 1-3 based on Angler Use Days (AUD). The percent angler use days was calculated separately for lotic and lentic systems. Special management waters were added that did not have AUD data but were weighted 1-3 by the Department's Fisheries Branch to correlate with SGCN and SERI weights.

The presence of individual species in an area are counted to attain a SGCN score, and then added to the SERI and Sportfish scores to arrive at a total species score.

Riparian:

Riparian areas in the Southwest are crucial habitats for wildlife sustainability and often serve as wildlife movement corridors within the landscape. Riparian communities and aquatic habitat make up less than 2% of the total land area in the arid western United States, but are considered the most productive and ecologically diverse habitats in Arizona. The role of riparian areas is disproportionate to their size because of their many ecological functions, most importantly:

- Fish and wildlife habitat – 70% of all threatened and endangered vertebrate species in Arizona depend on riparian areas
- Increased water storage and recharge for aquifers
- Reduction of floodwater runoff

- Filtration and retention of upland sediment
- Reduction of chemical inputs from uplands by immobilizing, storing, and transforming
- Stabilization of stream banks and build up of new stream banks

Weighting – Riparian areas represent some of the most important areas in Arizona for wildlife conservation and therefore were given a score of 3 (i.e., considered three times more important).

Unfragmented Areas:

This category analyzes large swaths of contiguous, unfragmented, blocks of habitat. The Department has identified the importance of maintaining unfragmented habitats as a critical component in the conservation of wildlife and wildlife habitat as well as addressing existing and predicted global climate change (i.e., protecting blocks of habitat across an elevational and vegetation gradient). Determining contiguous habitat was based on GIS analyses using all major barriers (i.e. roads, railways, canals, etc.) to delineate areas.

Weighting – The following is a brief description of how the Department is analyzing these areas: Unfragmented habitat blocks are analyzed based on the size of the area and weighted using size classes 0-9. For example, the largest 10% of unfragmented areas are given the top weight (9); the next largest 10% of unfragmented areas are given a weight of 8, and so on.

Species and Habitat Conservation Guide (SHCG):

All layers (SGCN, SERI, Sportfish, Riparian, and Unfragmented Areas) were rescaled from 0-9 and combined per the following equation:

$$\text{SHCG} = 3.5 \times (\text{SGCN} + \text{SERI} + \text{Sportfish}) + \text{Riparian} + \text{Unfragmented Areas}$$

Wildlife Corridors (Not yet included within the Species and Habitat Conservation Guide):

In 2003, several state and federal agencies and conservation organizations formed the Arizona Wildlife Linkage Workgroup (AWLW) and produced the “Arizona’s Wildlife Linkages Assessment” (AWLA) http://www.azdot.gov/Highways/OES/AZ_Wildlife_Linkages/index.asp. This group was comprised of Arizona Department of Transportation, Arizona Game and Fish Department, Federal Highway Administration, Northern Arizona University (NAU), Sky Island Alliance, USDA Forest Service, US Fish and Wildlife Service, the Wildlands Network. The representation has recently expanded to include Defenders of Wildlife and AZTEC Engineering. The AWLA is a Geographic Information System (GIS)-based, collaboratively-developed, statewide report on the wildlife habitat and linkages critical to sustaining wildlife habitat connectivity, with general recommendations for land use planners and managers. The AWLW has received considerable recognition as leading a groundbreaking initiative responsible for bringing the needs of wildlife to the forefront of planning processes. The group recognized, however, that this statewide effort was only the first step; that finer-scale analyses and reports would be needed to ensure biological, social, and economic successes at the project level. From 2005-2008, 16 high-priority wildlife linkages were identified from the original report and modeled in a GIS using a focal species/least-cost corridor approach designed by Dr. Paul Beier and the Corridor Design Team at NAU (www.corridordesign.org). The resultant reports, collectively named “Arizona’s Missing Linkages”, detail the ownership, landscape, and on-the-ground condition of each modeled linkage and provide important information that planners

need—such as types of crossing structures to consider and the importance of riparian features in the area.

Today, the AWLW is working on the next stage in this process—further identification of wildlife corridors and the crucial habitats they connect at the county level through collaboration between stakeholders and partners. Once all corridors and crucial habitat blocks are identified for a county in a mid-level report, prioritized linkages will be modeled as appropriate in a GIS using a least-cost corridor approach. Additional fine-scale linkage reports, potentially formatted similarly to the Arizona’s Missing Linkages reports, will be produced.

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