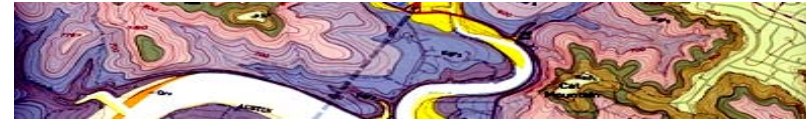


SECTION IV ARIZONA'S WILDLIFE LINKAGES MAPPING



The Arizona's Wildlife Linkages Map has been designed to be updated, modernized and an adaptive product. The original findings along with the enhancements from the subsequent workshops were merged together. Many of the mapped polygons have been adjusted to conform to the definitions of *habitat blocks* and *potential linkage zones* (Table 4-1). Additional revisions were made to reflect existing state biodiversity plans, regional conservation plans, greenways, and open space plans. Despite these efforts, the conservation status of all lands will need to be updated as they continue to change. Nonetheless, the map is a useful coarse-scale tool that identifies connectivity needs and opportunities in Arizona.

Further development and refinement of this map is part of the Arizona Wildlife Linkages Workgroup's future work plan (Figure 4-1). The maps and information contained in this report are not intended to be used to determine site-specific mitigation measures, rather the report details broad areas of concern and should alert planners and engineers of connectivity issues. This knowledge should motivate consultation with resource agencies and result in a more detailed project review. Over the next three years, detailed linkage designs will be developed for 24 of the proposed potential linkage zones (Section V; Section IX). The dynamic nature of the project will allow revisions and updates on a regular basis as new information becomes available.

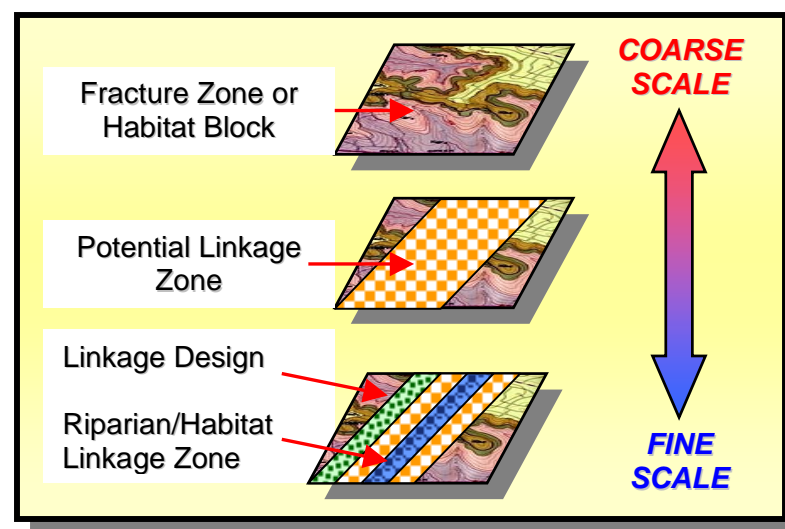


Figure 4-1. Diagram of Refinement Progression

Layers

The primary Geographic Information System (GIS) Layer utilized to develop the habitat blocks and the proposed potential linkage zones located across fracture zones was the land ownership layer for the state of Arizona. The State Land Department Forestry Division and the Arizona Land Resource Information System (ALRIS) maintain this data set.

Originally created in 1988, this coverage has been routinely updated but at the present time is not current. Federal boundaries were fully updated by the Bureau of Land Management (BLM) in 1994 and partially updated in 2001. In 1997, the Bureau of Indian Affairs (BIA) updated the Indian tribal land boundaries. The Arizona State Land Department (ASLD) on an on-going basis modifies State Land boundaries.

Layers depicting more current land ownership status were integrated into this project. These include the most current data layers reflecting National Refuge Areas, Arizona Game and Fish Department (AGFD) Lands, and known conservation areas. The boundaries of the habitat blocks and proposed potential linkage zones will be modified to incorporate the revised land ownership status as it becomes available.

The layer used is projected into GCS North American 1983 with North American 1983 datum and is in the Universal Transverse Mercator coordinate system. All subsequent layers used conform to this configuration through various transformations. A scale of 1:2,100,000 is used for all maps contained in this document.

The potential linkage zones that reside within habitat blocks were developed from topographic maps at a resolution of 1:24,000 loosely following elevation levels between major mountain ranges. The mountain ranges connected are within habitat blocks and as such were not given notable demarcation.

The 1993 data set depicting/detailing rivers, streams, and wash information was created using US Geologic Survey data. The ASLD Forestry Division and the ALRIS maintain it. Critical attributes are added by the Environmental Protection Agency.

HABITAT BLOCK: an area of land that consists of important wildlife habitat and can reasonably be expected to remain wild for at least 50 years. Habitat blocks are primarily comprised of lands within National Forests, National Parks, National Wildlife Refuges, large military reservations, tribal lands and lands managed by Bureau of Land Management or Bureau of Reclamation. Although some of these lands contain bombing ranges, barracks, reservoirs, and other non-natural elements, they still have a long-term prospect of serving as wildlife habitat. We recognize that tribal sovereignty retains the right to develop those lands. Habitat blocks also include private lands that are managed for conservation, such as Nature Conservancy preserves and some large ranches whose owners are committed to long-term conservation. All other private lands and land owned by Arizona State Land Department (which has no conservation mandate under current law) have for the most part been excluded. (Note: To keep maps readable, some habitat block polygons include small private and state inholdings that may not be conserved).

FRACTURE ZONE: areas of reduced permeability between habitat blocks. These regions are largely State Land, private holdings and transportation corridors. Roads, canals, urban areas, railroads, or border security operations limit or prevent animal movement, or threaten to do so in the foreseeable future in these zones. Most fracture zones need significant restoration to function as reliable linkages. Portions of the fracture zone are designated as potential linkage zones (see definition below). Resource agencies and conservation groups should continue to protect and enhance washes, streams, and rivers as major corridors in all areas of the fracture zone, including improvements to culverts and bridges to promote wildlife permeability.

POTENTIAL LINKAGE ZONE: a portion or subset of the fracture zone or habitat block identified as an area critical to wildlife movement. Threats must be managed if connectivity is to be maintained or restored. We emphasize that these polygons depict planning areas within which a functional linkage(s) must be designed and conserved. In most cases, only a small fraction of the proposed potential linkage zone will be included in the linkage design (Section X), which will be developed in future detailed analyses.

RIPARIAN HABITAT/LINKAGE ZONE: streams that historically supported riparian communities and perennial water flow (in some cases pools linked by subsurface flow for much of the year). Each potentially provides essential habitat for aquatic species, and critical landscape connectivity for both aquatic and terrestrial animals (Section VIII).

Table 4-1. Important Terms



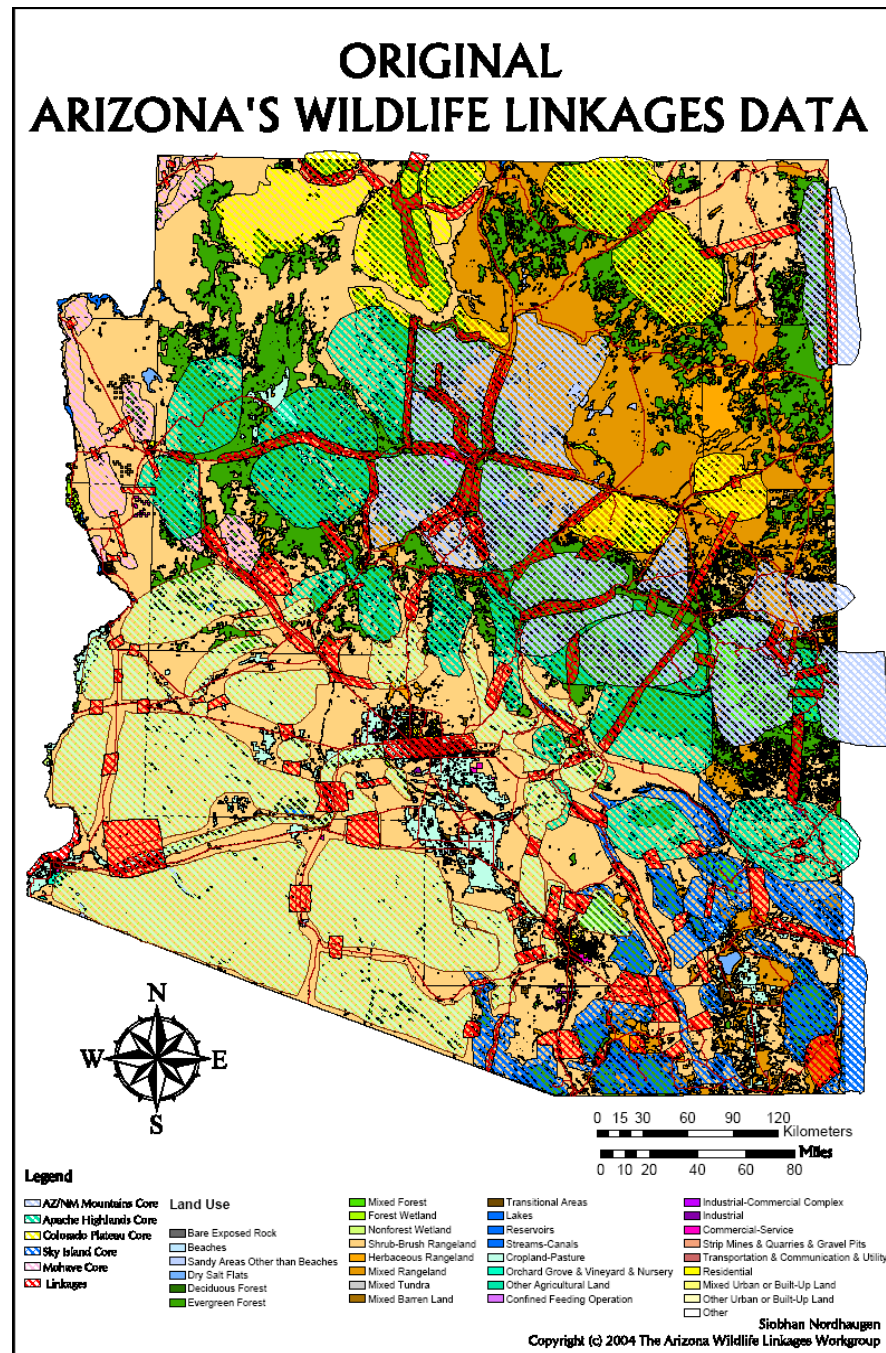


Figure 4-2. The Original Findings from the April Workshop

Mapping Generalities

The ATIS Roads Layer is a linear representation of the centerline of the highway system. As the centerline approximates the middle of the roadway, this layer was buffered to 125 feet either side of centerline to create a gross depiction of the transportation corridor. This, by design, is supposed to roughly indicate the rights-of-way surrounding the roadway. The habitat blocks intersected by roadways are mapped to this buffer. An additional buffer of 0.93 mile (1.5 kilometer) was created around both sides of the roadway. This second buffer was created to allow the potential linkage zones that are in between habitat blocks and are only inclusive of the transportation corridor buffer to be visible at the given map scale. Also, this buffer represents a planning area that includes approach lands for consideration in the development of projects. This buffer is considered as part of the fracture zone.

A buffer of 0.93 mile (1.5 kilometers) was generated on either side of the rivers and washes in the riparian layer in an attempt to capture the transition areas within the riparian corridor.

Habitat Block Decision Rules

Habitat blocks are based on land ownership status and include:

- Arizona Game and Fish lands;
- Bureau of Land Management lands;
- Bureau of Reclamation lands;
- Known conservation areas and conservation managed private lands;
- Military Holdings (Department of Defense);
- National Forests;
- National Parks;
- National Wildlife Refuge Areas;
- Small in holdings of State Land and private ownership; and
- Tribal lands.

The habitat blocks intersected by roads have their boundaries mapped to the 125-foot buffer created around primary roadways to give a gross depiction of the transportation corridor.

Resulting areas between the habitat blocks, including the transportation corridor, are classified as fracture zones.

Tribal lands have been included in the habitat blocks, but we recognize tribal sovereignty retains the right to develop those lands.

In several cases, workshop participants had identified habitat blocks comprised entirely of a checkerboard of State Land and private holdings. Because these lands do not have a high probability of serving as wildlife habitat over the long term, it was felt it would be unwise to designate a potential linkage zone between them. Rather, these areas were incorporated into the potential linkage zones.

Potential Linkage Zone Decision Rules

- ⊗ Potential linkage zones identified within close proximity of one another were merged.
- ⊗ Overlapping potential linkage zones were merged utilizing the outermost boundaries.
- ⊗ Potential linkage zones identified completely within a habitat block were left intact.
- ⊗ Potential linkage zones that cross the fracture zone were mapped between the boundaries of the habitat blocks and over the top of the fracture zone.
- ⊗ Potential linkage zones crossing the fracture zone that consist solely of the transportation corridor were mapped to the larger buffer for planning purposes.

