Arizona’s Wildlife Linkages

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Focus of practice is on humans and is economically driven.

Road programs and projects have traditionally been blind to ecology.

There is a disconnect to some degree between biologists, planners, engineers and administrators.

The good news is change is on its way!
Arizona Wildlife Linkages
Workgroup

- Formed Partnerships
- Identified Common Goals
- Established Early Buy-in
- Investment of Staff & Resources = Commitment
ACTIONS AFFECTING AND CONTRIBUTING TO ROADWAY ECOLOGY

Federal Agencies
- Federal Highways Administration
- Arizona Game & Fish Department
- U.S. Forest Service
- Bureau of Land Management
- U.S. Fish & Wildlife Service

American Association of Highways & Transportation (AASHTO)

ICOET Meetings

Workshops on Linkages in Individual States

State Transportation & Wildlife Agencies

Landscape Linkages Modeling

Wildlife Monitoring Studies

Wildlife-Safety Modeling and Analyses
Prepared by: The Arizona Wildlife Linkages Workgroup

ARIZONA’S WILDLIFE LINKAGES ASSESSMENT
WHY THE ASSESSMENT WAS UNDERTAKEN

- Improve Highway Safety
- Need to Maintain Wildlife Permeability and Promote Conservation
SAFETY STATISTICS

- 1+ million deer-vehicle collisions in the U.S. annually (only ½ reported)  
  (Knapp 2004)
- 26,647 motor vehicle occupants annually are involved in crashes, and go to emergency rooms  
  (Centers for Disease Control 2003)
- 200 human deaths annually  
  (Knapp 2004)

The FHWA estimates the value of one human life to be $1.5 million

...unless it’s your Loved One

PRICELESS!!!
Wildlife vehicle collisions account for a significant amount of accidents, injuries and deaths on rural highways in Arizona.
Current State of Practice

• Information from collisions typically comes from Highway Patrol (Damage in excess of $1,000+ reported only)
• Collision locations are not always recorded accurately
• Identification of road-killed animals is not always reported correctly
• Data is often ambiguous
• Once data is gathered, it may not be mapped and referenced for use in transportation projects
The Assessment Fits into the BIGGER Wildlife Connectivity Strategy for North America
Habitat Loss And Fragmentation Are Significant Causes Of Species Extinction
ARIZONA'S BURGEONING POPULATION INTENSIFIES THE NEED FOR THE ASSESSMENT ROADWAYS IN SOUTHERN ARIZONA.

2,500,000 More People in AZ by 2020

ROADWAYS IN SOUTHERN ARIZONA
Purpose of the Assessment

- To identify and prioritize broad linkage zones that will facilitate movement for Arizona’s diverse array of wildlife species
- To ultimately promote safe passage for wildlife and people
The Assessment

- Outlines the processes used to define and map the locations of important wildlife linkage zones

- Explains the criterion used to prioritize these areas for further analysis
Collaborative Pro-active Approach

- Local and Regional Expertise
- Comprehensive (more than just roads)
- Science-based
- Emphasis on Improving (not just mitigating threats to) Connectivity
Basic Questions:

- What habitats are we trying to connect?
- Are these the best linkage and crossing areas?
Analyze

Prioritize

Integrate

Identify

**Coarse Identification of Habitat Blocks and Their Associated Potential Linkage Zones**

- Data Compilation/Digitizing of Map
- Delineation of Habitat Blocks and Linkage Zones
- Reconciliation of Datasheets with Drawn Habitat Blocks and Linkages
- Exclusion of Private and State Land Within Habitat Blocks

**ARIZONA’S MISSING LINKAGES WORKSHOP**

- Riparian Areas Classified as both Habitat Block and Linkage Zone

**FOLLOW-UP WORKSHOPS**

- Development of Prioritization Matrix: Threats/Opportunities versus Biological Value
- Criteria Identification and Definition
- Weighted Percentage Determination

- Re-evaluation of Identified Habitat Blocks and Potential Linkage Zones
- Modification/Addition of Identified Habitat Blocks and Potential Linkage Zones
- Verification of Inclusion of Existing Wildlife Connectivity Plans

**Preliminary Prioritization of Potential Linkage Zones**

**Linkage Designs**
HABITAT BLOCKS

- Large contiguous block of habitat consisting of public or tribal lands
FRACTURE ZONE

- Areas of reduced permeability between habitat blocks that consist of transportation corridors, State and privately owned lands
POTENTIAL LINKAGE ZONES

- A portion or subset of a habitat block or fracture zone under threat, and identified as being critical to wildlife movement
RIPARIAN HABITAT/LINKAGE ZONES

- provides essential habitat for aquatic species, and critical landscape connectivity for both aquatic and terrestrial species.
Arizona's Wildlife Linkages Map

- 152 Broad Linkages Identified to Date
- Continuing Process of Revisions and Additions
- Expect to Double the Number of Linkages by 2008
EACH LINKAGE ZONE DESCRIBES:

- Agency Jurisdictions
- Land Ownership
- Ecoregion
- Species
- Biotic Communities
- Threats/Opportunities
Agency Jurisdictions and Landownership

- Federal Agencies
- State Agencies
- Counties
- Cities
- Tribes
- Private

Boundaries mean nothing to wildlife!
Threats and Opportunities

- ADOT, US Forest Service, County Transportation Plans
- Urbanization – Green Space
- Less than a handful of wildlife crossings currently exist across canals
- Border Security
- Military Activities
- Railroads
NO SPECIES LEFT BEHIND!
Biotic Communities

- Sonoran Desert Lower Colorado Subdivision
- Sonoran Desert, Arizona Uplands
- Chihuahuan Desert
- Mohave Desert
- Great Basin Desert scrub
- Semi desert Grasslands
- Madrean Evergreen Woodlands
- Interior Chaparral
- Great Basin Conifer Woodlands
- Plains & Great Basin Grasslands
- Petran Montane Conifer Forest
- Sub alpine Conifer Forest
- Sub alpine Grasslands

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Biotic Communities

- Dovetails into the Arizona Game and Fish Department’s Comprehensive Wildlife Conservation Strategy (CWCS)
- CWCS utilizes an extensive threat matrix based on biotic communities within the Nature Conservancy’s ecoregion designations
Ecoregions

- Identified Linkages can be Cross-Referenced with the Nature Conservancy’s Ecoregional Assessments
This is Just the First Step

- Initial “Catch All” Approach
- 152 Broad Linkage Zones Identified to Date
- There is still much work to be done!
Need To Work More Closely With:

- Cities and Counties
  - Bond Initiatives
  - Green Space Planning
- Contractors & Consultants
- Planners
- Land Management Agencies
- Governor’s Growth and Infrastructure Initiatives
Integrate Wildlife Connectivity into Transportation and Regional Plans

- Ensure that Connectivity Needs are Addressed Upfront in Project Planning Efforts
- Starting Point for Detailed Consultation and Coordination among the Stakeholders
Need to Continue Innovative Research
Implementation

- **Identification of Linkage Areas is Only the First Step**
- **What Needs To Be Done To Secure, Manage, and Protect Linkage Areas?**

Photo credit: Reno Sommerhalder

Banff National Park, Alberta
Continue Linkage Zone ID and Refinement

- Identification of Additional Linkage Zones within Habitat Blocks
- Site Specific Analysis
Linkage Zone Analysis

- Provides the Basis for Determination of Best Linkage Placement
- Fundamental to Planning for Wildlife Crossings
- Increases the Likelihood of Creating Effective Wildlife Crossings
- Site Specific for Use by Planners, Land Managers and Engineers
Seeking Alternative Solutions
In the Long Term

We need a statewide vision for protecting and restoring habitat connectivity, which is vital for maintaining healthy populations of native species.
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http://www.azdot.gov/highways/OES/index.asp