Highway 395/203 Wildlife Crossing Study

- Principles of Wildlife Road Ecology
- Mono Deer Herd Ecology
- A Focus on the Round Valley Deer Herd and its Use of the Hwy 395/203 Study Area
- Highway Mitigation for Wildlife Mortality
- Are Wildlife Crossing Structures Really the Solution?
- Wildlife Crossing Research Needs in the Hwy 395/203 Study Area
- Questions
Wildlife Road Ecology
Potential Impacts to Wildlife

• Changes in the Amount and Quality of Habitat
  ➢ Habitat Loss (direct habitat removal for road construction)
  
  ➢ Reduced Habitat Quality (road avoidance by some species due to traffic disturbance; e.g., breeding birds)
  
  ➢ Improved Habitat Quality (e.g., increased forage quality from mowing of palatable brush species)
Wildlife Road Ecology
Potential Impacts to Wildlife

- Impacts to landscape connectivity (degree to which landscape facilitates animal movement)
- Barrier effects (indirect effects on normal distribution patterns and reduced gene flow)
- Direct mortality and higher animal death rates
- Population sink for some species
- Mortality sink (animals drawn to unfavorable conditions along roadway)
Mono Deer Herd Ecology
Mono Deer Herd Ecology

• Most conspicuous and widespread large mammal in Mono County
• Six distinct mule deer herds in Mono County currently comprised of an estimated 10,000 animals
• Five of the 6 herds are interstate herds that winter in NV and summer in CA
• All herds are migratory with distinct seasonal ranges:
  ➢ Winter ranges
  ➢ Transition ranges (including migration corridors and delay or holding areas)
  ➢ Summer ranges
Mono Deer Herd Ecology
Migration Corridors and Holding Areas

• Migration Corridors consist of numerous traditional migration routes oriented along major topographic features

• Deer show strong fidelity to these migration routes from one generation to the next

• All Mono County herds use well defined spring and fall holding areas where deer congregate in large numbers

• All migration routes either bisect or come in contact with Hwy 395
Deer Herd Estimated Herd Size

<table>
<thead>
<tr>
<th>Deer Herd</th>
<th>Estimated Size</th>
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<tbody>
<tr>
<td>Round Valley</td>
<td>2,500</td>
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<tr>
<td>White Mountain</td>
<td>1,000</td>
</tr>
<tr>
<td>Casa Diablo</td>
<td>1,000</td>
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<tr>
<td>Walker-Mono</td>
<td>5,500</td>
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<tr>
<td></td>
<td>10,000</td>
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</tbody>
</table>

Legend

Winter Range
Migration Corridors
Deer Carcasses (2002-2015; n = 1667)
Features of the Sherwin Deer Holding Area

• Enlarged portion of the migration corridor located at the base of an abrupt elevational change

• Jeffrey pine forest and sagebrush scrub are dominant habitat types

• Deer delay migration on the holding area for 6-10 weeks (April-May) during spring and 2-4 weeks (Oct-Nov) in the fall

• Provides high quality forage that enable deer to quickly regain body condition lost over winter

• Overlaps Highways 395/203
Highway Mitigation for Wildlife Mortality

Measures shown to be largely ineffective:

• Influence Motorist Behavior
  ➢ Increased highway lighting, ultrasonic whistles, roadside reflectors, education, rumble strips, visible speed indicators, law enforcement, driver warning signs

Measures shown to have positive results:

• Influence Animal Behavior
  ➢ Crossing Structures
    ▪ Construct underpasses, overpasses and culverts
    ▪ Construct deer fencing to channel animal movement to crossing structures
  ➢ Habitat Modification
    ▪ Reduce palatable roadside forages
    ▪ Channel wildlife to designated structures
Are Wildlife Crossing Structures Really the Solution?

• The deer road-kill data and the literature suggests, YES!
Bottom-line is we don’t really know yet!

**Advantages:**
- Good deer road-kill data set
- Mammoth and Convict Creek crossings
- Good connectivity to adjacent public land
- Public support
- Literature supports wildlife crossings as successful mitigation

**Disadvantages:**
- Highway fully developed
- Expensive
- Lack of drainage features bisecting the roadway
- Long distances between potential crossing structures
- Airport facilities and fencing
- Increased human presence
Species do not function in isolation!
Wildlife Research Needs in the Hwy 395/203 Study Area

• Assess Wildlife Distribution, Abundance and Movement Patterns
  ➢ Track counts (deer)
  ➢ Camera traps (deer, large carnivores and mesocarnivores)
  ➢ Intensive road mortality monitoring
  ➢ GPS radio collars (deer)

• Identify wildlife movement and road mortality locations in relation to proposed and existing structures
  ➢ FSR Concepts 1-5
  ➢ Airport fence
  ➢ Mammoth Creek overpass
  ➢ Convict Creek culverts
  ➢ Mammoth Industrial Park
Some Challenges Moving Forward

• Working with what we have (e.g., lack of topography, existing infrastructure)

• Balancing potential biodiversity benefits with economic costs using a phased construction approach (where do we get the biggest bang for our buck?)

• Designing a project that not only allows for safe deer passage, but also allows safe passage for a wide range of non-target species

• Determining how the project will impact human activity (e.g., recreation) and, conversely, how humans could influence wildlife use of the crossing structures

• Establishing effective communication and collaboration among stakeholders
Questions?

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