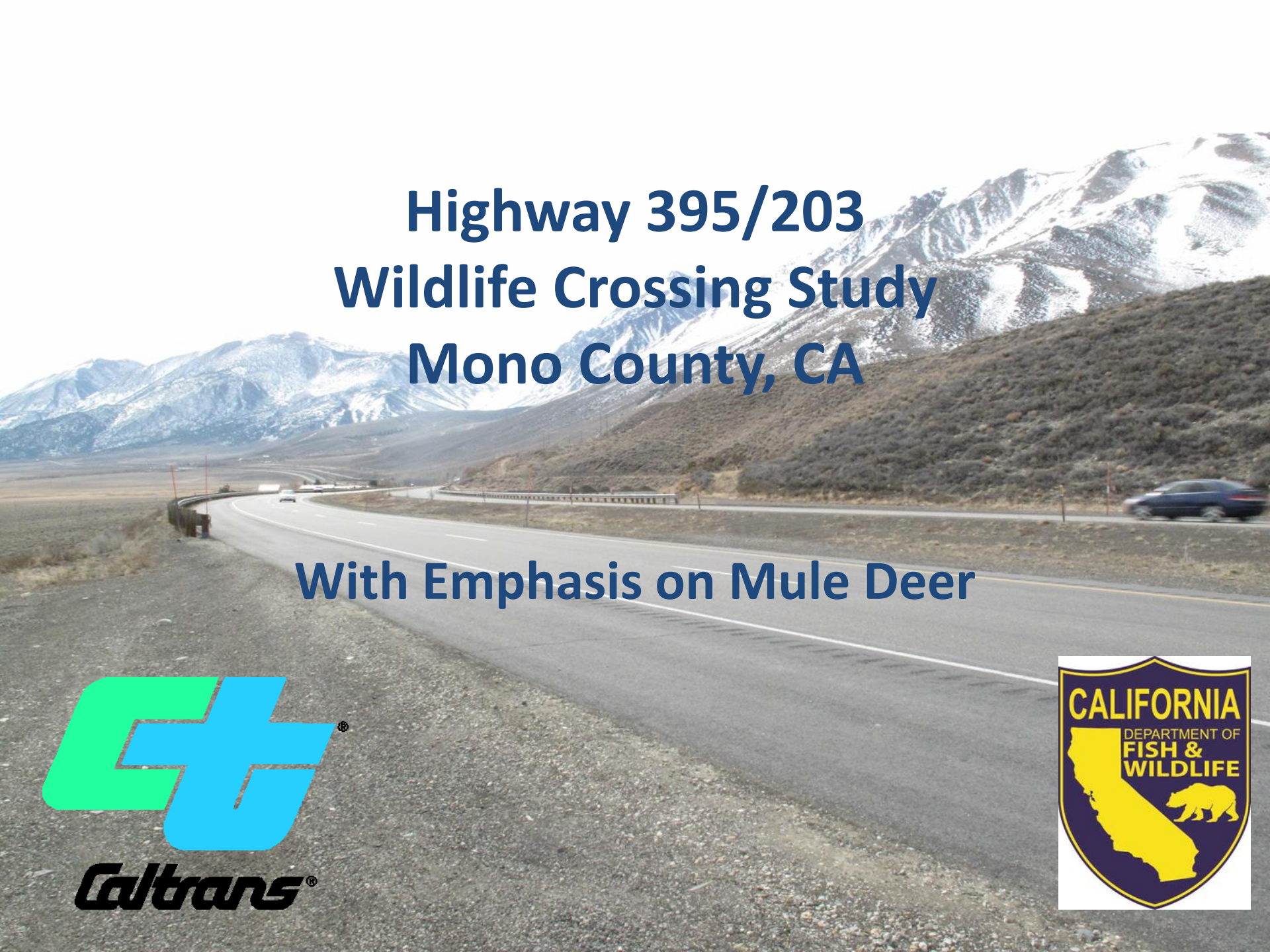

Highway 395/203
Wildlife Crossing Study
Mono County, CA

With Emphasis on Mule Deer

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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)


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Mono Deer Herd Ecology

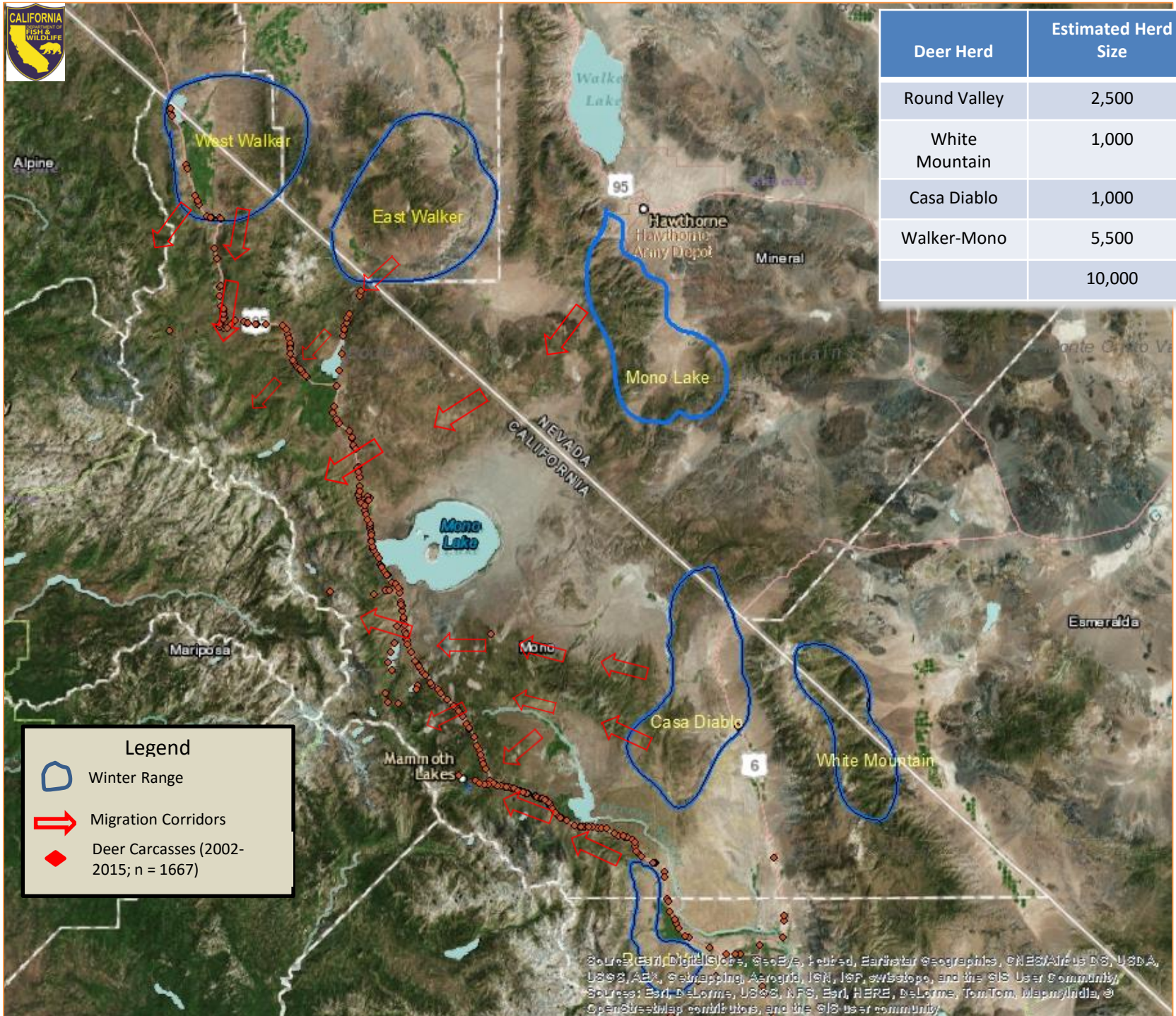
Mono Deer Herd Ecology

- 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

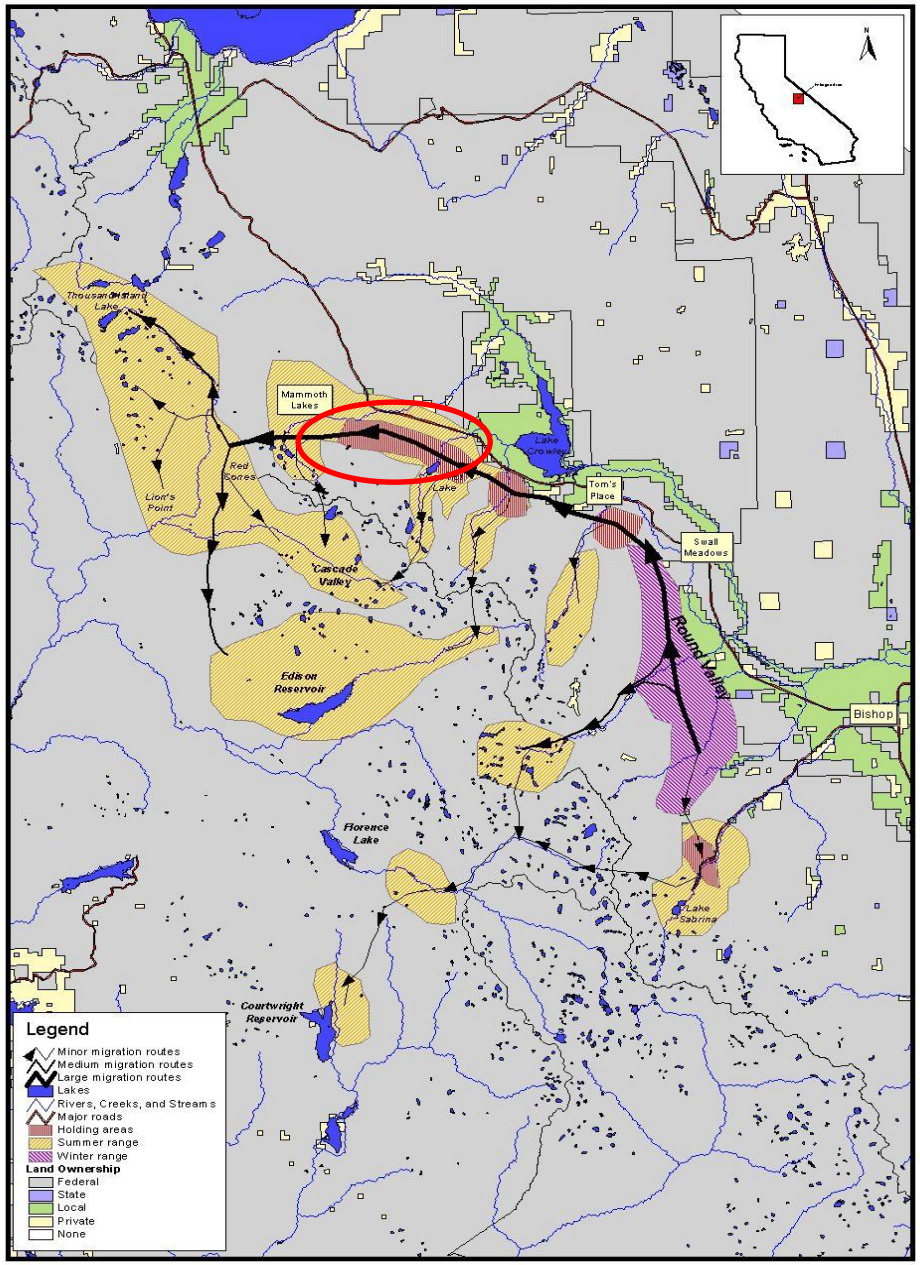
Migration Corridors and Holding Areas

- 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



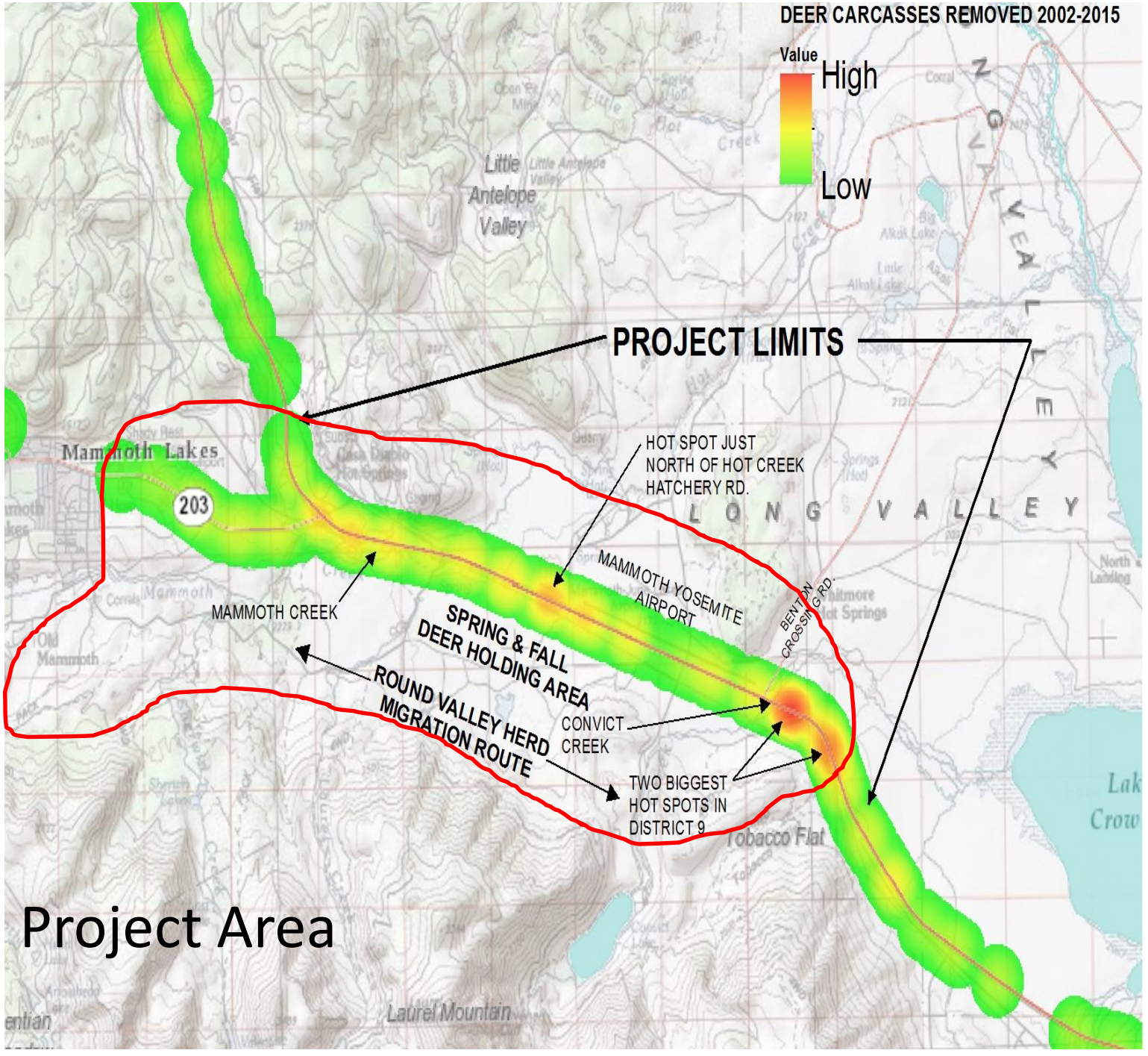
Deer Herd	Estimated Herd Size
Round Valley	2,500
White Mountain	1,000
Casa Diablo	1,000
Walker-Mono	5,500
	10,000

Seasonal Use and Migration Routes of Round Valley Mule Deer



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


DEER CARCASSES REMOVED 2002-2015
Value
High
Low
PROJECT LIMITS
HOT SPOT JUST NORTH OF HOT CREEK HATCHERY RD.
MAMMOTH YOSEMITE AIRPORT
BENTON CROSSING RD.
MAMMOTH CREEK
SPRING & FALL DEER HOLDING AREA
ROUND VALLEY HERD MIGRATION ROUTE
CONVICT CREEK
TWO BIGGEST HOT SPOTS IN DISTRICT 9
Mammoth Lakes
203
Little Antelope Valley
LONG VALLEY
Tobacco Flat
Laurel Mountain
Project Area

Highway Mitigation for Wildlife Mortality

Measures shown to be largely ineffective:

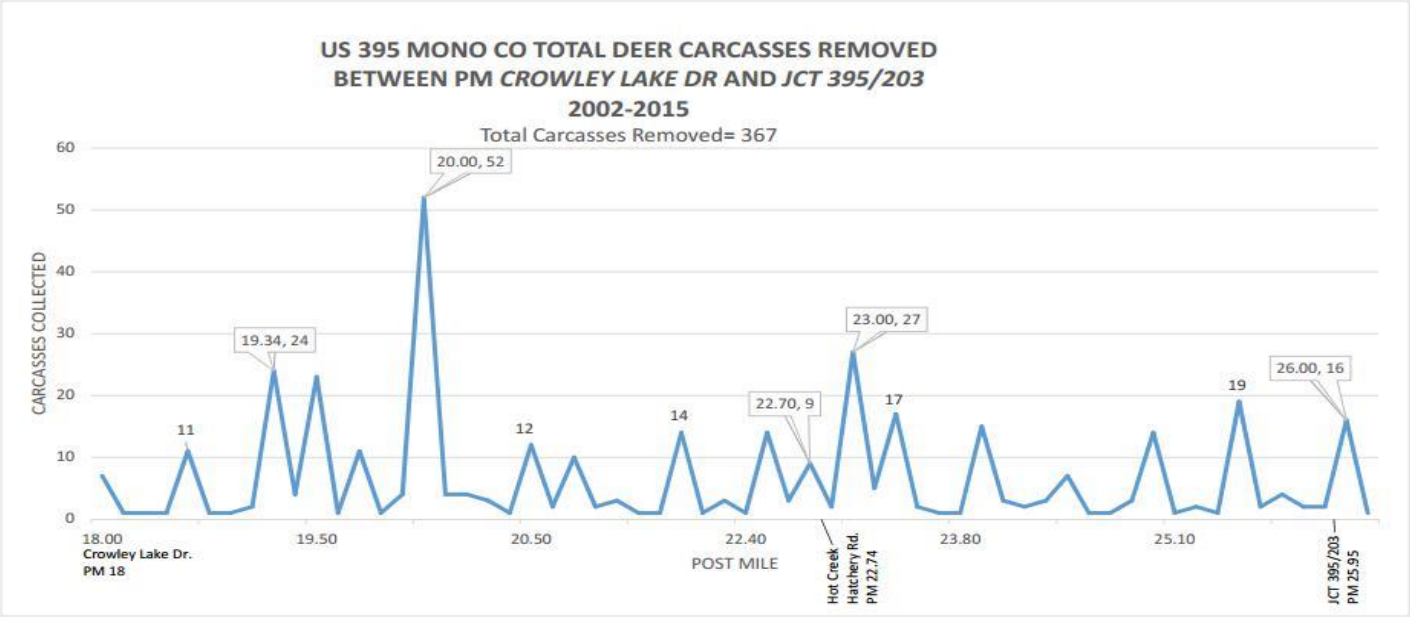
- Influence Motorist Behavior
  - Increased highway lighting, ultrasonic whistles, roadside reflectors, education, rumble strips, visible speed indicators, law enforcement, driver warning signs

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:

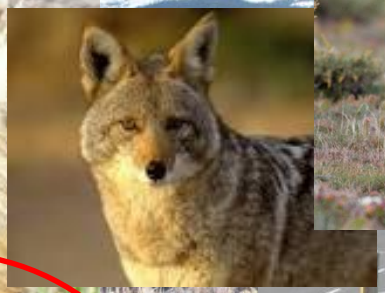
- Good deer road-kill data set
- Mammoth and Convict Creek crossings
- Good connectivity to adjacent public land
- Public support
- Literature supports wildlife crossings as successful mitigation

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

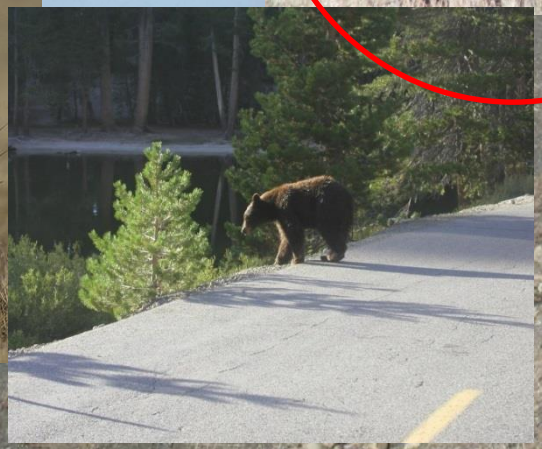
Species do not function in isolation!












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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