



Photo: Joe Riis/Wyoming Migration Initiative

DEPARTMENT OF THE INTERIOR SECRETARIAL ORDER 3362

Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors

John C. Tull
S) 3362 Nevada/California Liaison



OUTLINE



Photo: John C. Tull

1 | SO 3362 OVERVIEW

- Summary
- Principles
- Approach and objectives
- Timeline and process
- State Action Plans

2 | IMPLEMENTATION

- Science funding (USGS, FWS)
- Habitat funding (NFWF, PFW)
- BLM related activities

3 | GOING FORWARD

- Partnering with other state and federal agencies, other partners
- SO 3362 in 2019



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Photo: Scott Copeland Images

SO 3362 SUMMARY

“This Order directs appropriate bureaus within the Department of the Interior ... to work in close partnership with the states ... to enhance and improve the quality of big-game winter range and migration corridor habitat on Federal lands ... in a way that recognizes state authority to conserve and manage big-game species and respects private property rights. ... Additionally, this Order seeks ... opportunities ...to increase and maintain sustainable big game populations across western states.”

PRINCIPLES

Secretarial Order 3362

- Respect state authority for management of wildlife
- Respect the rights of private property owners
- Be pragmatic and move forward with implementation knowing SO3362 cannot be everything for everyone
- Keep focus on state-identified priority corridors, stopover areas, or winter habitats – avoid scattershot approach with limited cumulative value
- Fully embrace the conceptual and legal directive of “multiple-use” lands, as applicable
- Seek collaboration not polarization, actively and positively engaging landowners, non-governmental organizations, industry, and others through one-on-one interactions



APPROACH & OBJECTIVES

Secretarial Order 3362



STATE-IDENTIFIED BIG GAME MIGRATION CORRIDORS FOR MULE DEER, PRONGHORN OR ELK

- Close partnership with State Wildlife Agencies
- Recognize state authority and private property rights
- State developed plans identify 3-5 highest priority wildlife migration corridors for mule deer, pronghorn or elk
- Develop science to support identification and refinement of corridors, stopover areas, and winter habitats
- Identify and prioritize habitat restoration and conservation projects/seek funding



TIMELINE & PROCESS

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ORDER ISSUED

On February 8, 2018, Secretary Zinke signed SO3362, Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors across 11 western states.



COORDINATION

Casey Stemler was chosen to serve as SO3362 Coordinator. Liaisons were established June 2018 from various DOI agencies.



STATE PLANS

State wildlife agencies responded to requests for 3-5 corridors and 2-3 research priorities. These were developed into state action plans in coordination with liaisons, October 2018.



RESEARCH

Research priorities were funded using USFWS Science Applications funds. The Wildlife and Sport Fish Restoration program for Region 8 developed grants with Nevada and California.



HABITAT

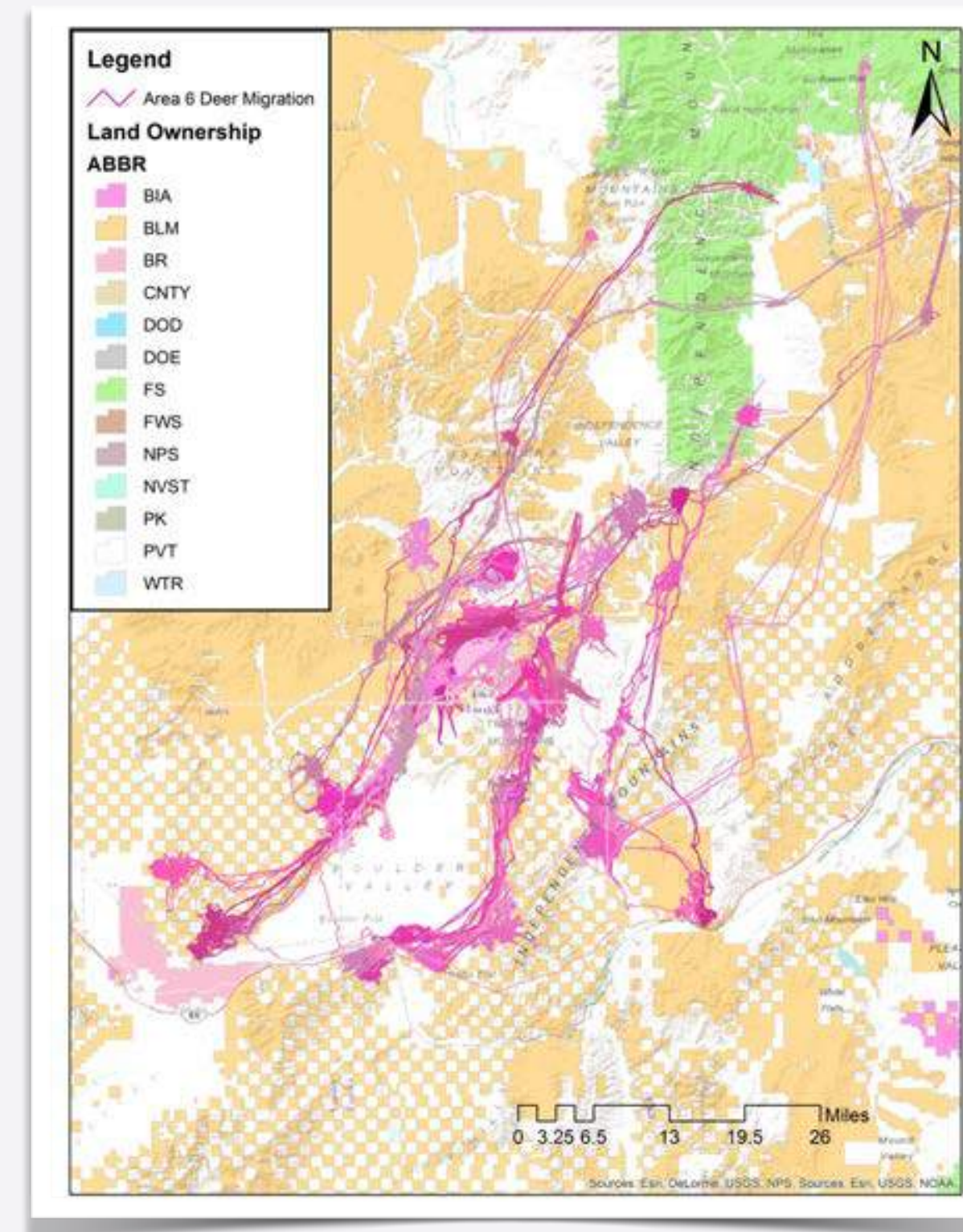
Habitat funds were made available in spring 2019. NFWF managed a grant program with \$2.65M from BLM, FWS-PFW, and private industry. FWS-PFW had additional funds directed to SO3362 actions on private lands.

STATE ACTION PLANS

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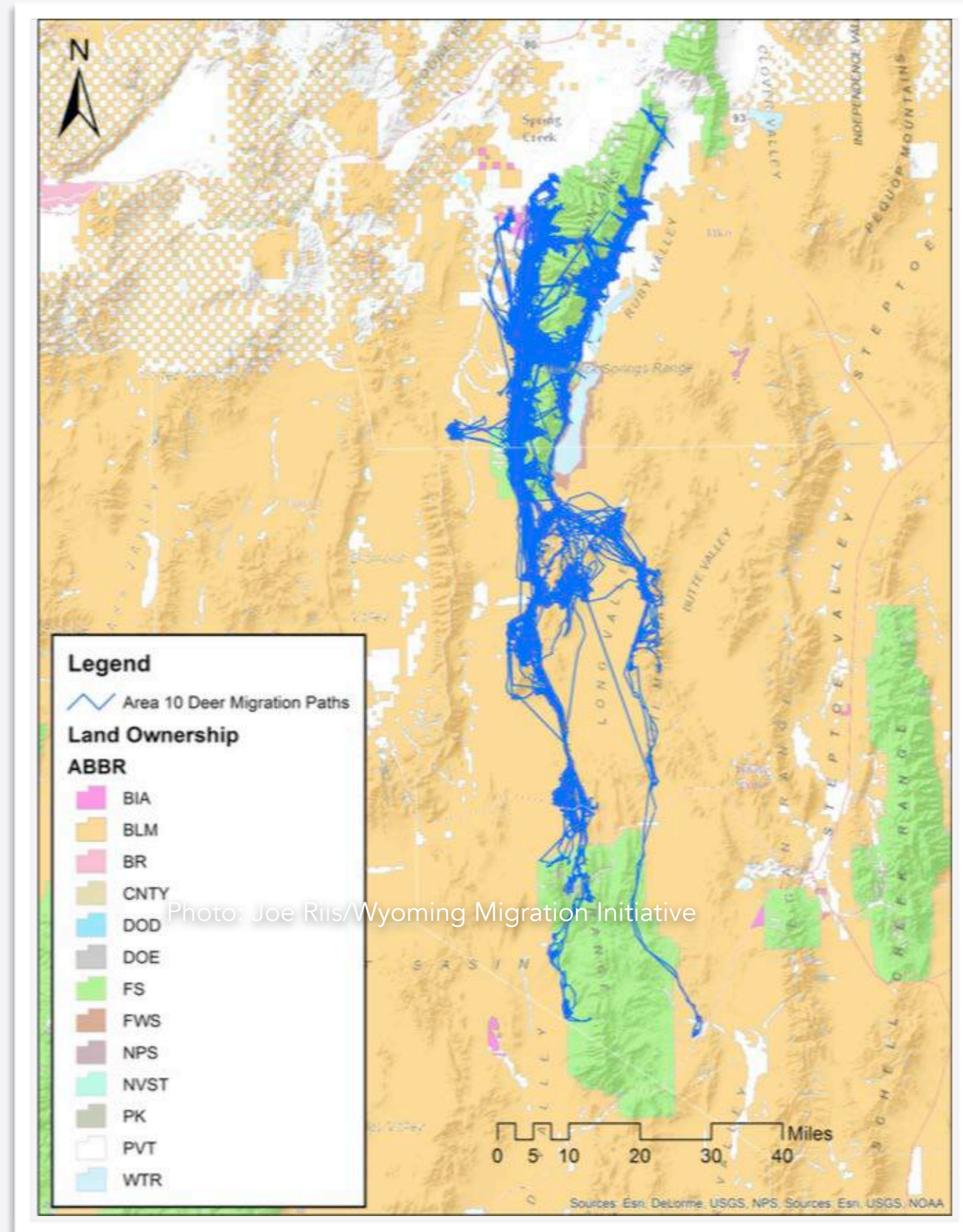
ALL 11 STATES PROVIDED RESPONSES TO LETTERS FROM DOI REQUESTING TOP 3-5 MIGRATION CORRIDORS AND TOP 2-3 RESEARCH PRIORITIES

- State plans were intended to create focus, allow partnership development, and ultimately serve as the tool to accomplish conservation
- Liaisons used state responses to assist development of individual state action plans.
- These plans were submitted to all respective state directors for approval. All 11 states plans were approved by October 17.
- Plans were shared with partners and partnership on implementation was encouraged.
- Reached out to assess state interest in holding state level meetings with partners.



NEVADA ACTION PLAN

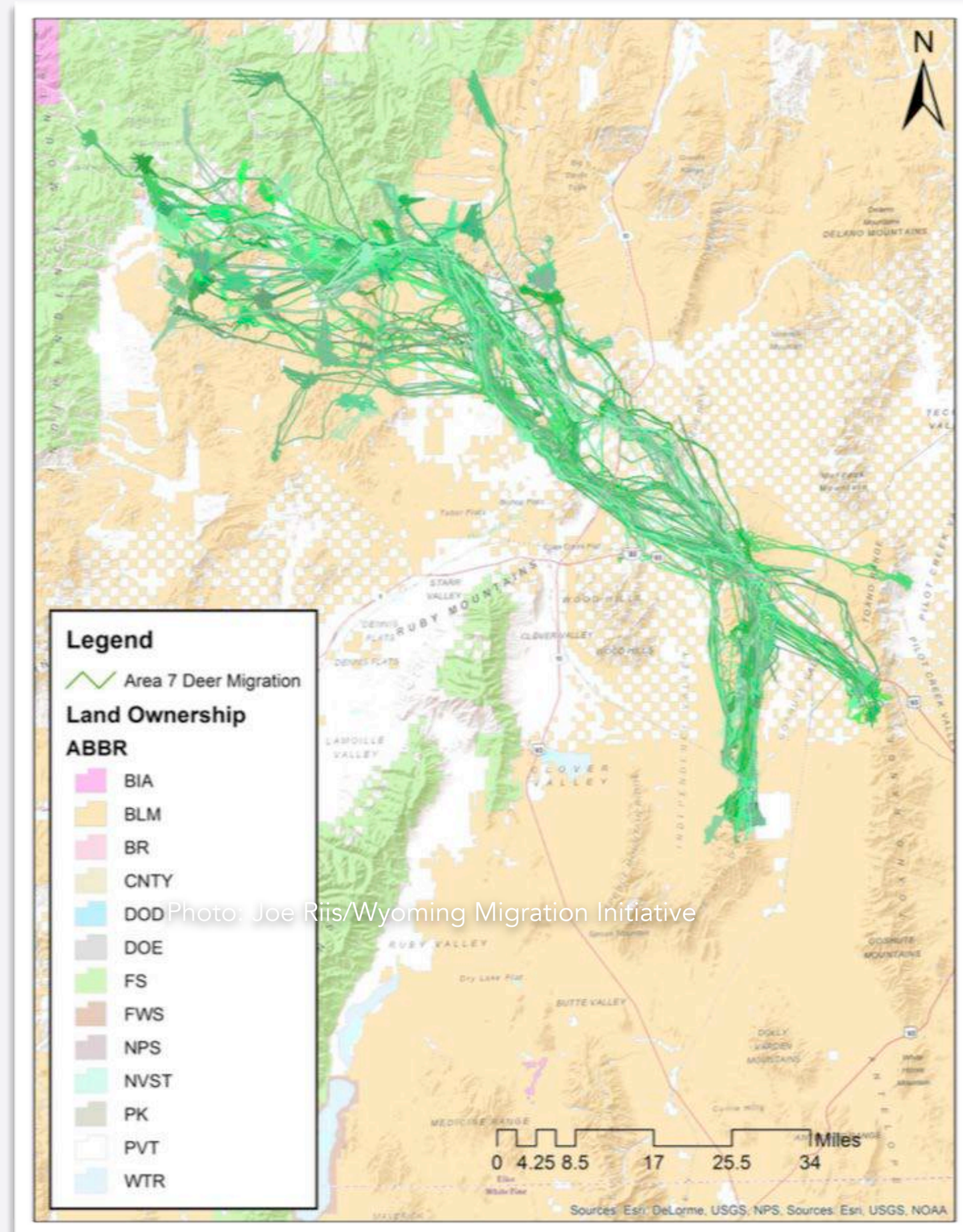
Secretarial Order 3362



Priority Corridor #1: Mule Deer Migration
Nevada Management Area 10

NEVADA ACTION PLAN

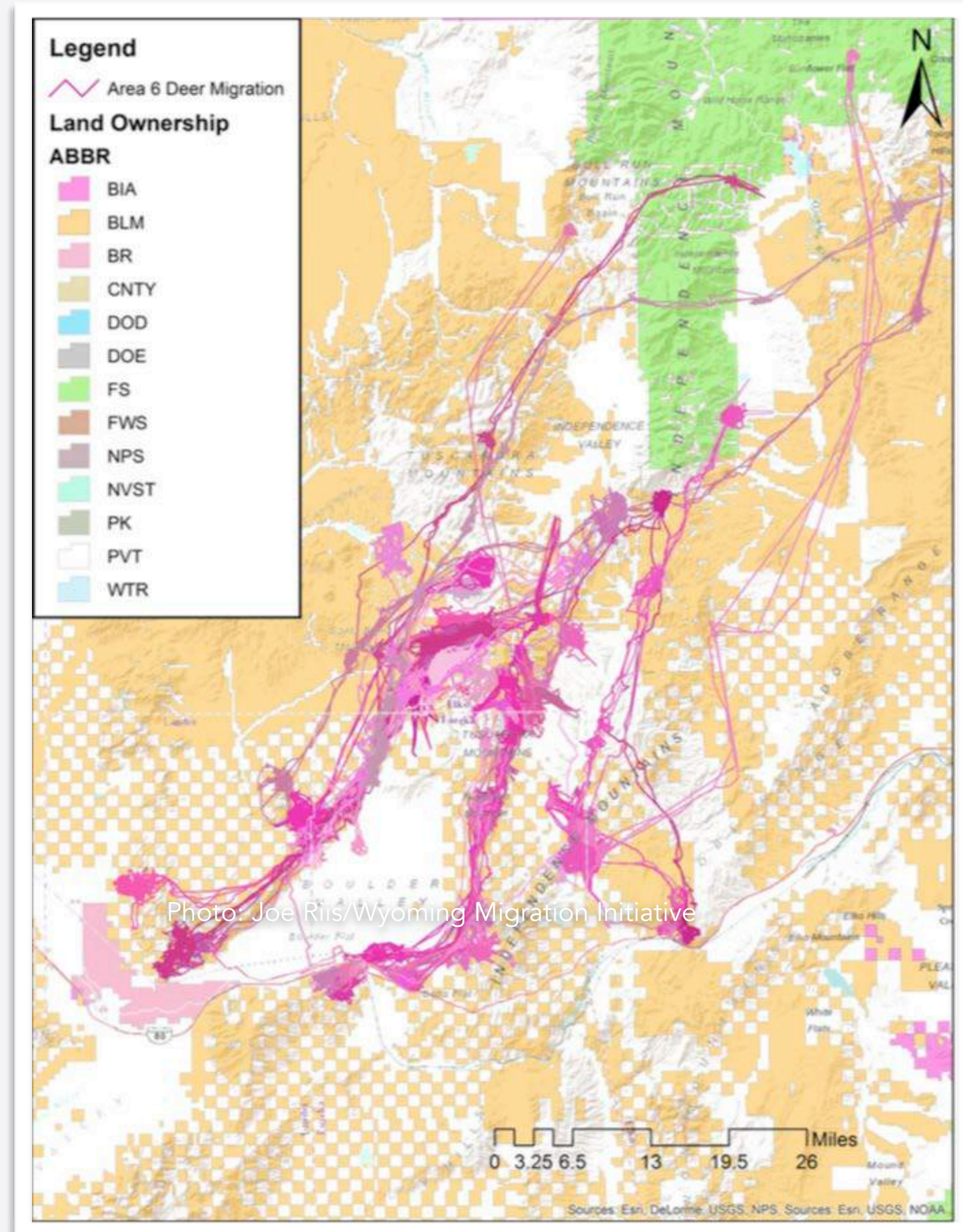
Secretarial Order 3362



Priority Corridor #2: Mule Deer Migration
Nevada Management Area 7

NEVADA ACTION PLAN

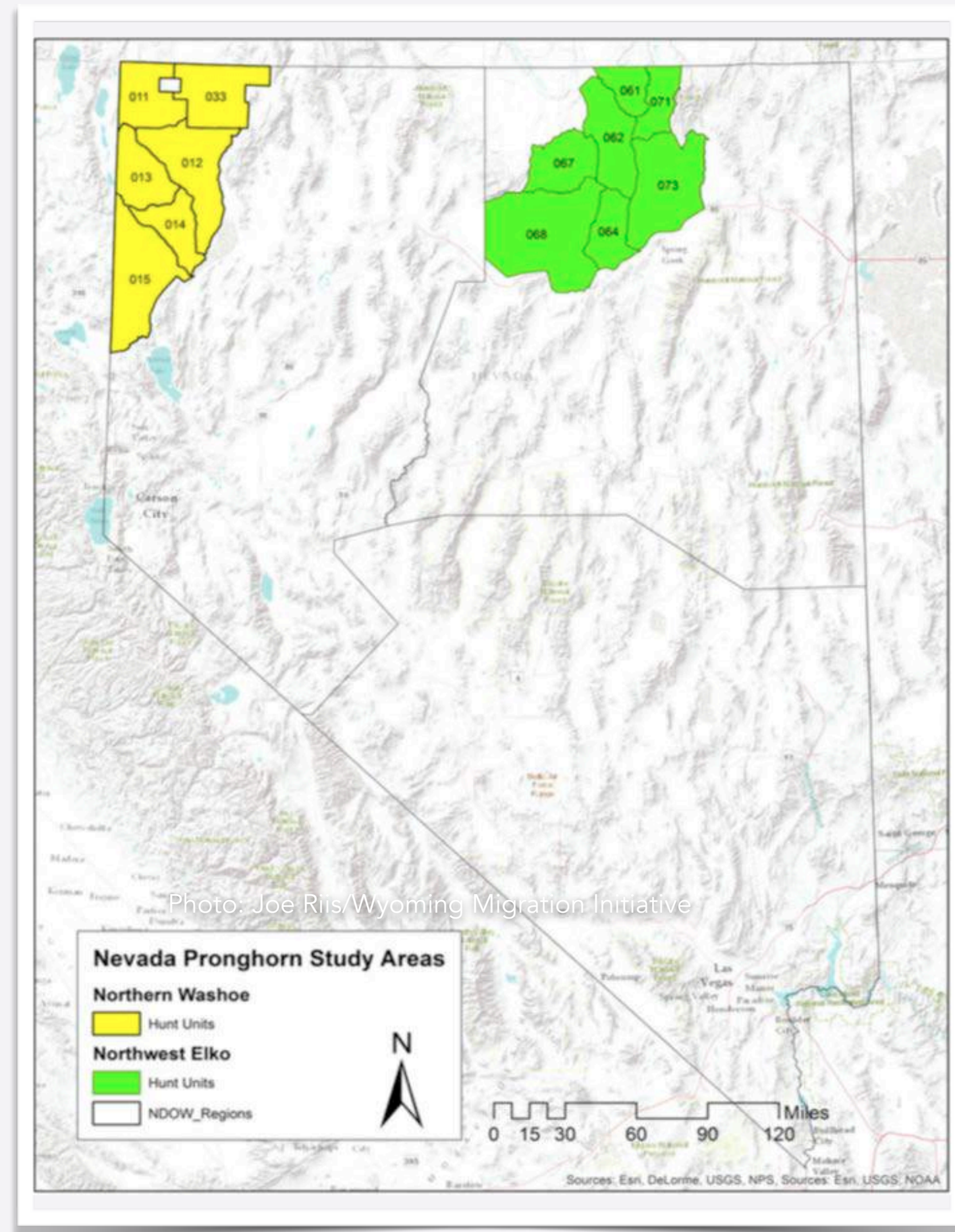
Secretarial Order 3362



Priority Corridor #3: Mule Deer Migration
Nevada Management Area 6

NEVADA ACTION PLAN

Secretarial Order 3362



**Priority Corridor #4: Pronghorn Migration
Game Management Areas 1-3 (Northern
Washoe)**

**Priority Corridor #5: Pronghorn Migration
Game Management Areas 6-7 (Northwest Elko)**

NEVADA ACTION PLAN

Secretarial Order 3362



STATE-IDENTIFIED BIG GAME MIGRATION RESEARCH PRIORITIES

- Mapping crucial migration corridors for pronghorn in Nevada
 - GPS collars for 60 pronghorn in priority corridors #4 & #5
- Capacity support for analytical needs for new and existing GPS data in Nevada

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- Partnering with other state and federal agencies, other partners
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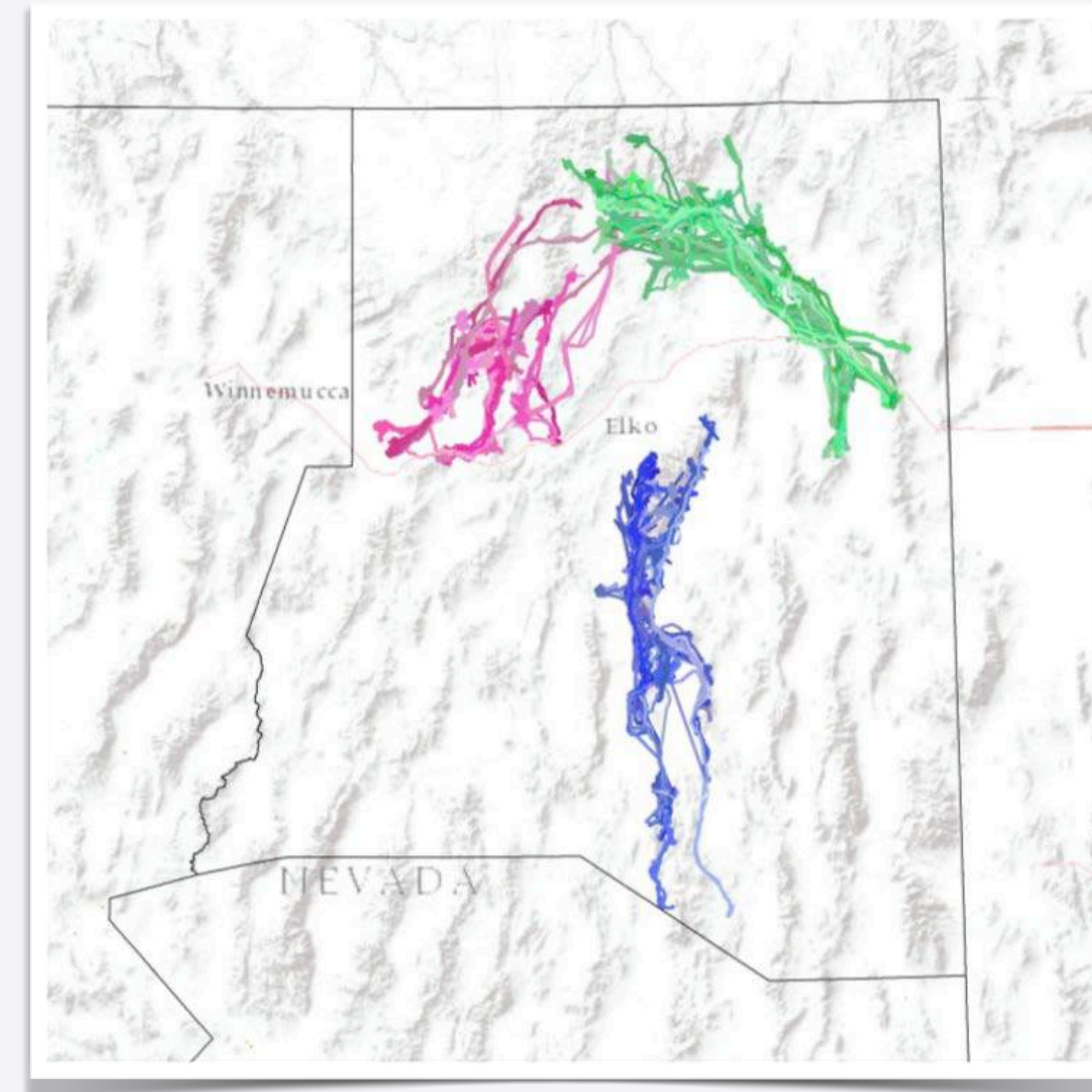


SCIENCE FUNDING

Secretarial Order 3362

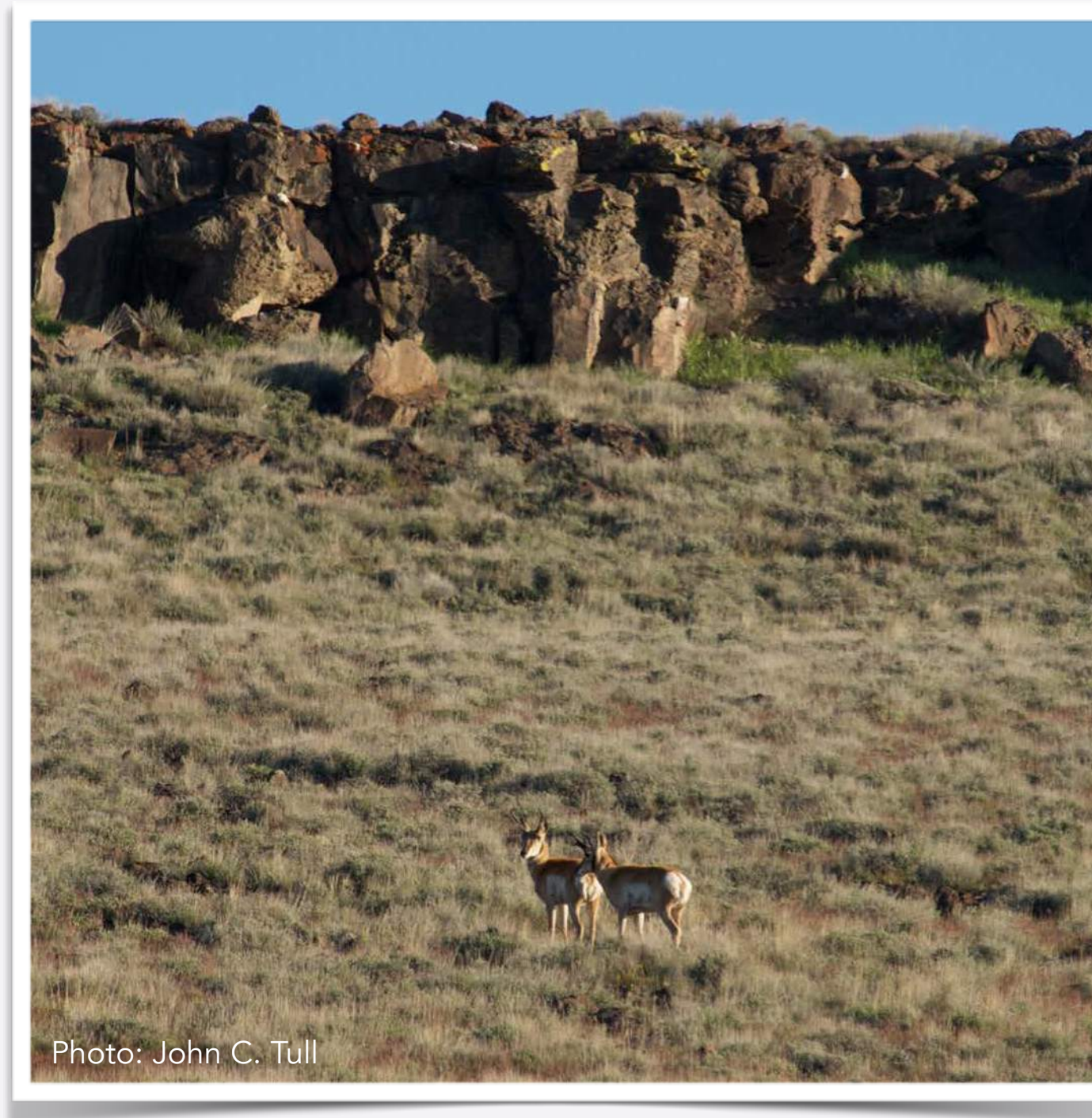
SOURCES OF FUNDING FOR RESEARCH/SCIENCE

- USGS – Corridor Mapping Team, Matt Kaufman, Wyoming Cooperative Fish and Wildlife Research Unit
 - \$700,000 to support Brownian Bridge Movement Analyses of fine-scale GPS collar data and provide technical assistance, capacity, and troubleshooting
- USFWS – Science Applications
 - \$3,000,000 distributed across the 11 states to fund top research priorities identified in the State Action Plans



NEVADA SCIENCE PROJECTS

Secretarial Order 3362



- \$282,975 for pronghorn collaring activities
 - 60 pronghorn to be fitted with GPS collars in northern Nevada to identify migration corridors, important stopover areas, and winter/summer crucial habitats
- \$80,000 for analytical support through USGS

HABITAT FUNDING

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SOURCES OF FUNDING FOR RESEARCH/SCIENCE

- National Fish and Wildlife Grant Program
 - \$2,750,000 – 2019 Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors
 - BLM: \$2,000,000 – Sage-steppe only restriction
 - USFWS Partners for Fish and Wildlife: \$500,000 – Private lands restriction
 - ConocoPhillips: \$250,000 – Unrestricted
- USFWS – Partners for Fish and Wildlife Internal Funding
 - \$1,500,000 for private lands actions supporting state-identified habitat project priorities

The screenshot shows the NFWF website with the following content:

- Header:** NFWF logo and navigation links: Who We Are, What We Do, Part...
- Navigation:** Home, Request for Proposals, State Action Plans
- Main Image:** A group of mule deer in a field.
- Section Title:** 2019 Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors Request for Proposals
- Application Information:**
 - Spring 2019 RFP - CLOSED (Updated: 4/25/2019)
 - Spring 2019 Tip Sheet (Updated: 10/23/2018)
 - State Action Plans (Updated: 10/23/2018)

NEVADA HABITAT PROJECTS

Secretarial Order 3362



- \$308,239 through NFWF Grant Program
 - Ruby Mountains Conservation Easement for 2,100 acres as match in partnership with the Rocky Mountain Elk Foundation to benefit Area 10 mule deer, priority corridor #1
 - Middle Rock Creek and Izenhood post-fire habitat restoration for critical winter habitats to benefit Area 6 mule deer, priority corridor #3
- \$245,863 through Partners for Fish and Wildlife
 - Harrison Pass Invasive Annual Grass Control Project (Deer Area 10)
 - Mary's River Watershed Fence Improvement Project (Deer, Elk and Pronghorn Area 7)
 - Boulder Valley Big Game Migration Corridor Improvement Project (Deer and Pronghorn Area 6)
 - Beaver Flat Sagebrush Restoration Project (Deer and Pronghorn Area 6)
 - Bally Mountain Fence Improvement Project (Pronghorn Areas 1-3)

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GOING FORWARD

Secretarial Order 3362



- Additional Federal Partnering
 - USFS is committed to supporting habitat projects in state identified migration corridors
 - BLM uses SO3362 corridors for prioritizing national funds
- Additional Partnering
 - Nevada Department of Transportation and NDOW exploring a “Migration Summit” to examine transportation and planning issues, improved coordination, and cross-jurisdictional consideration of migration corridors

GOING FORWARD

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Photo: BLM

- Remain focused on 3-5 priority migration corridors
- Funding capacity from DOI agencies remains consistent
- BLM funding is no longer restricted to sage-steppe
- USFWS will continue to focus on science and private lands
- Liaisons will work with state agencies to refine existing corridors based on new data and analysis ...
- ... and develop focused habitat projects that will conserve or restore habitats in priority corridors
- Expand efforts with USDA and Department of Transportation





Photo: John C. Tull

Wildlife Migration Corridors in Nevada

Cody Schroeder

Mule Deer and Pronghorn Staff Specialist

Nevada Department of Wildlife



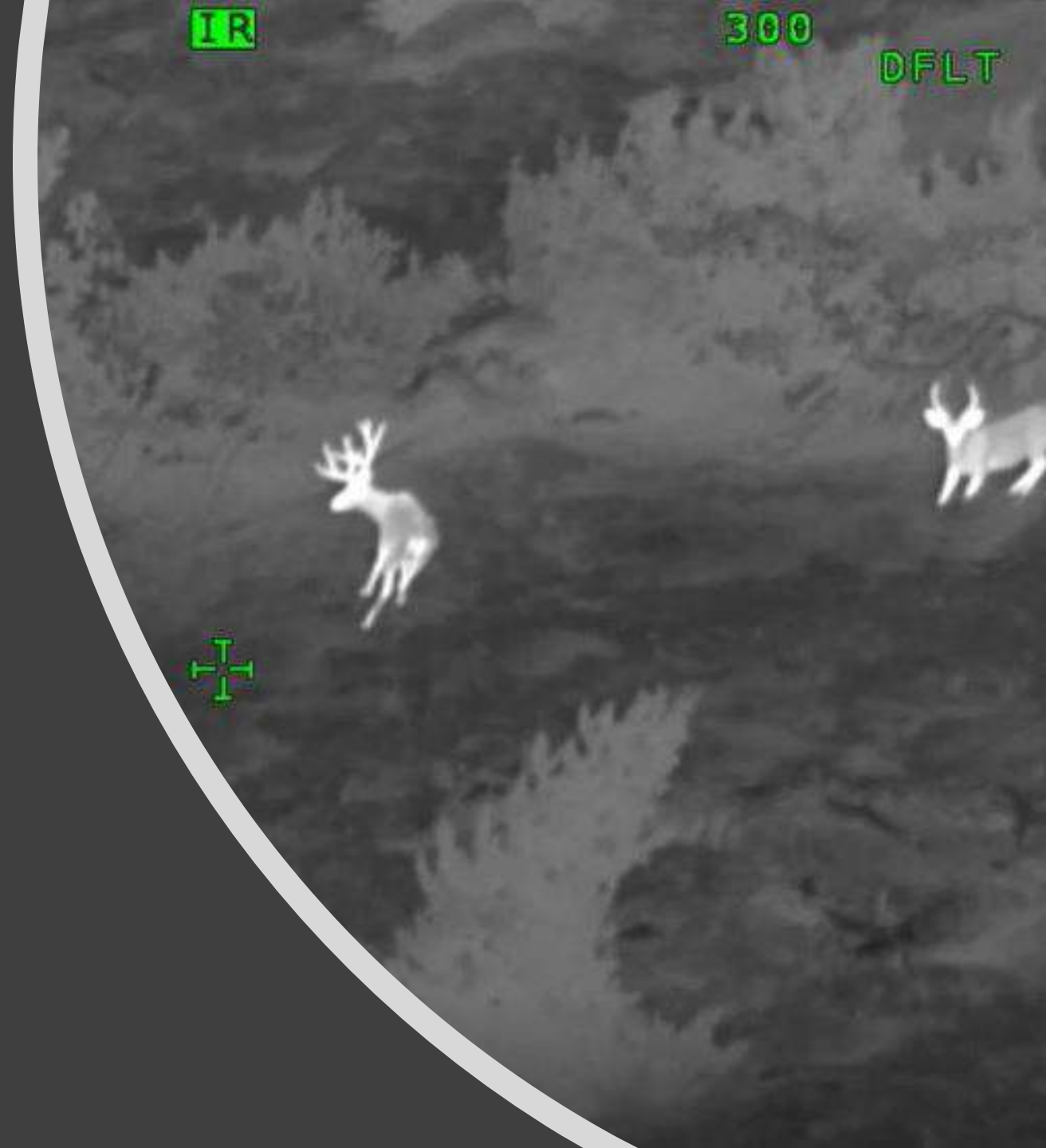
Overview

Part I

- Background of migration science in Nevada
- Past marking and tagging studies
- Applied management for transportation

Part II

- SO 3362
- Nevada State Action Plan
- Mapping migration corridors
- Policy and planning



Background of Migration Science in NV

MOVEMENTS OF MULE DEER • Gruell and Papez 419

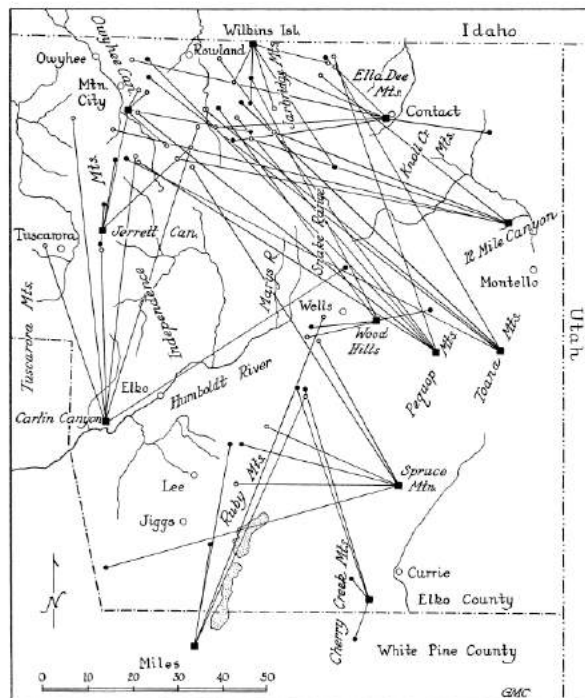


Fig. 4. Movements of deer marked on winter ranges (squares) and subsequently identified on summer ranges (circles). Open circles represent animals recognized by sight observation; solid circles represent deer killed during hunting season.

MOVEMENTS OF MULE DEER IN NORTHEASTERN NEVADA

GEORGE E. GRUELL, Nevada Fish and Game Department, Elko¹

NICK J. PAPEZ, Nevada Fish and Game Department, Elko

Abstract: The migratory habits of mule deer (*Odocoileus hemionus*) in typical basin-and-range country of northeastern Nevada were studied for 6 years, 1955–60. In all, 789 deer were marked, 438 with bells, on 12 different winter ranges. Sightings and kill returns indicated that individual deer tended to return each year to the same winter and summer ranges. Often, deer wintering together scattered widely to different summer ranges, and deer on a particular summer range often moved to widely separated winter ranges. Many migrating deer traveled far past potential destinations; some fall migrants bypassed winter ranges 5 or 10 miles distant, and moved 80 or 90 miles farther. Migrants from other ranges did the same, only in opposite directions, thus forming a crisscross migration. There appeared to be little topographic orientation with respect to major drainages and mountain ranges. Management implications of the scattered, crisscross migrations are discussed.

Journal of Wildlife Management 1963 Vol. 27 No. 3



Unique Markers

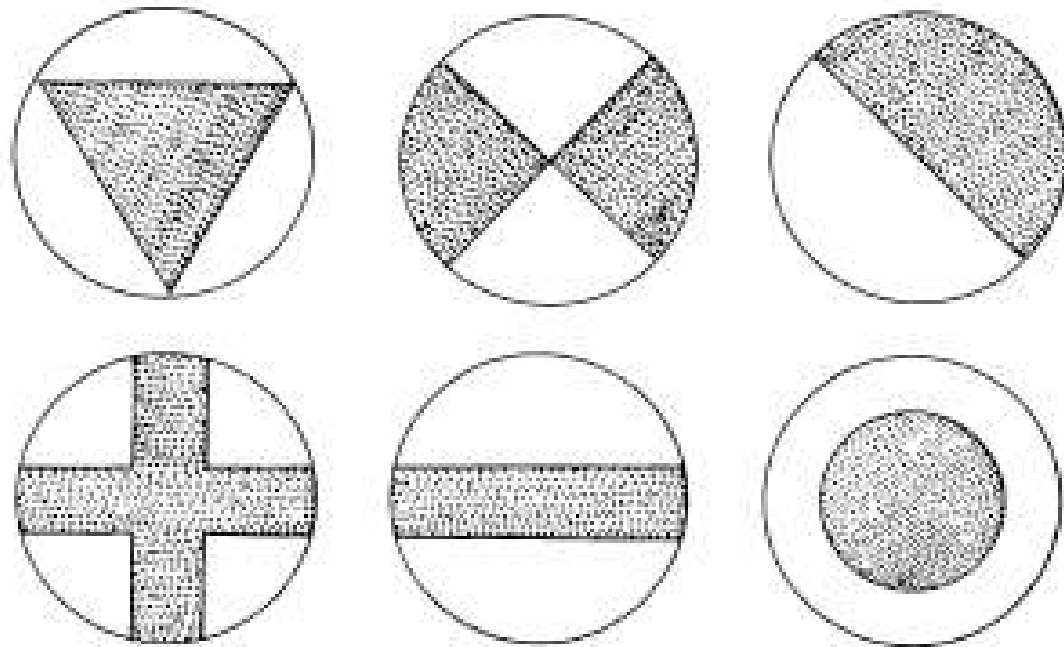


Fig. 2. Basic symbols used on ear discs. Colors used were red, green, and black on a white background, and black on a yellow background.

Gruell and Papez JWM 1963

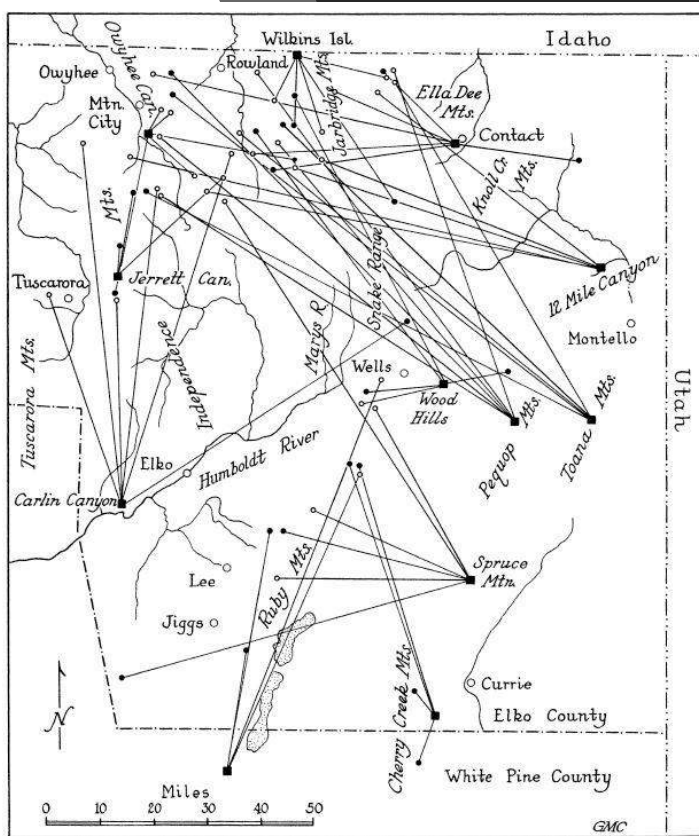


Fig. 4. Movements of deer marked on winter ranges (squares) and subsequently identified on summer ranges (circles). Open circles represent animals recognized by sight observation; solid circles represent deer killed during hunting season.

- Migration distances varied from 20 miles to > 100 miles
- Hypothesized that mule deer used natural terrain features during migration periods
- Distinct “crisscrossing” pattern was observed across several mountain ranges
- Mule deer were often found on shared winter ranges
- Distinct and separate summer ranges separated by over 100 miles

PATTERNS AND FACTORS IN MIGRATORY MOVEMENTS OF NEVADA MULE DEER

Mike Cox and Chet Van Dellen, NDOW

- 2011 WAFWA Deer and Elk Workshop in Albuquerque, New Mexico
- Presented GPS collar data for 72 mule deer marked between 2006-2011
- 6 study areas throughout NV
- Radio collars programmed to collect GPS fixes at 1 hour and 4 hour intervals during migratory periods for 2 years



General Migration Tendencies

Days

- Min 1 day
- Avg 33 days
- Max 147 days

Distance

- Min 13 miles
- Avg 47 miles
- Max 145 miles

Use of Stopovers

- 44% of migrations involved deer spending > 1 week in discrete “stop-over” or transition areas

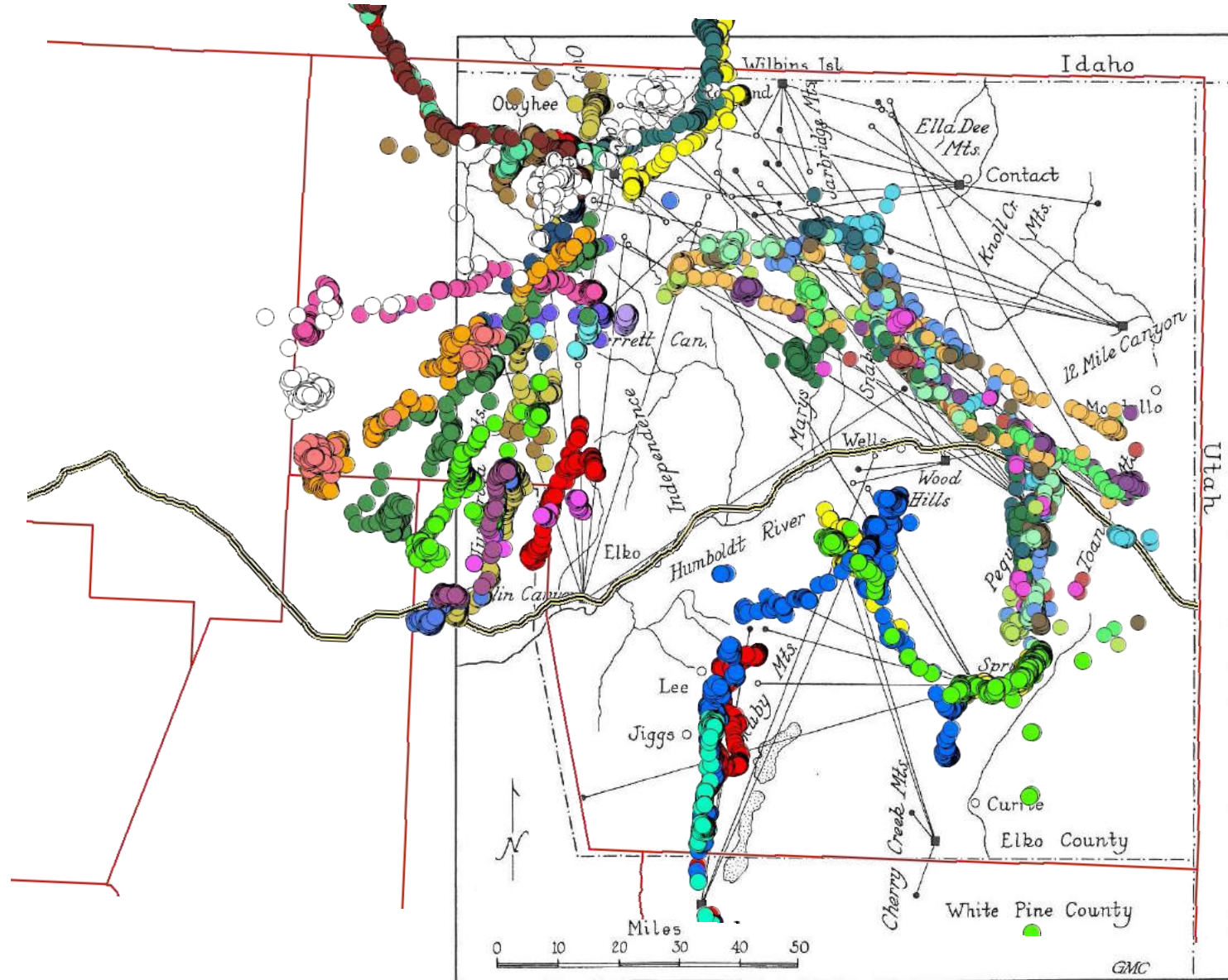
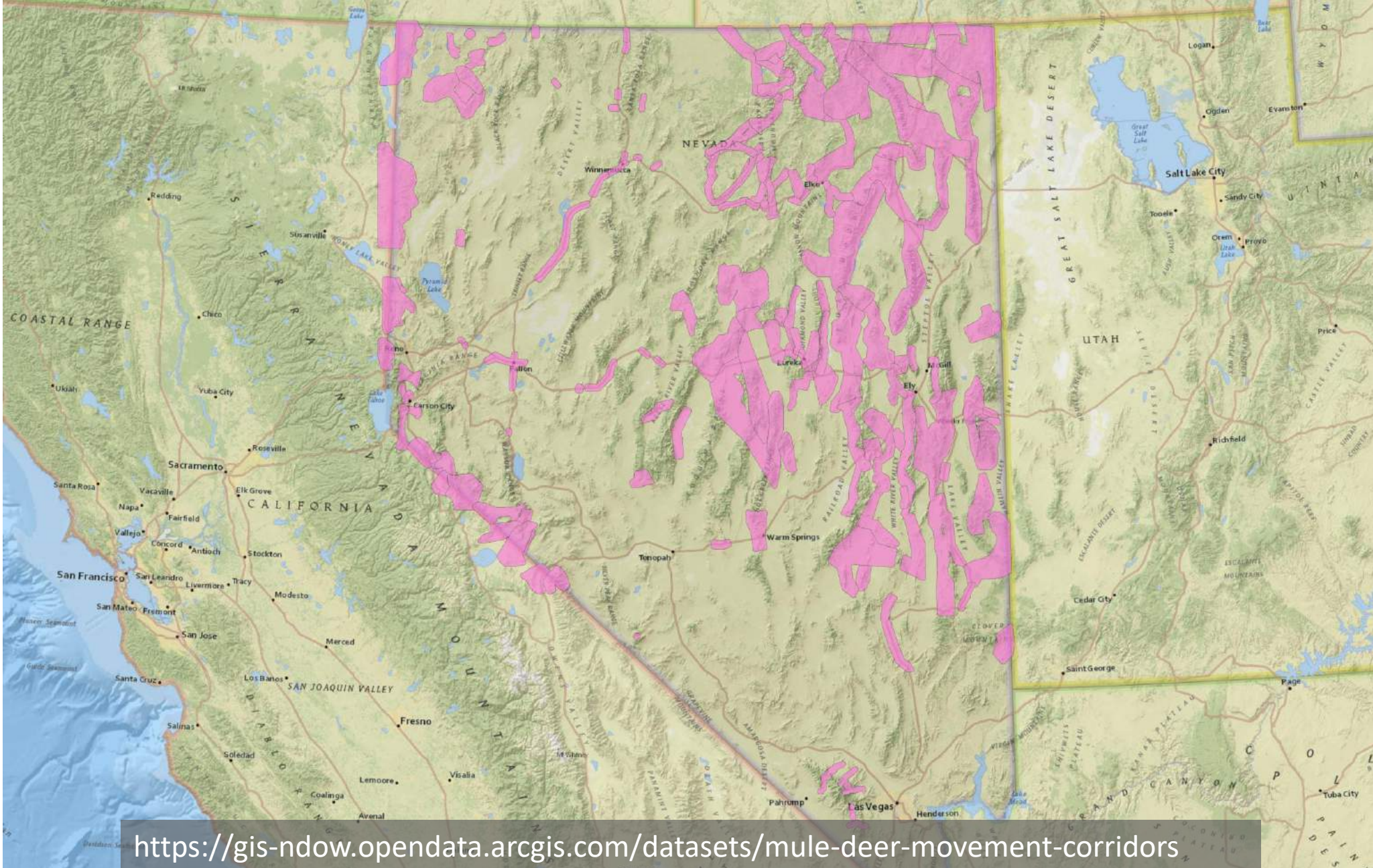


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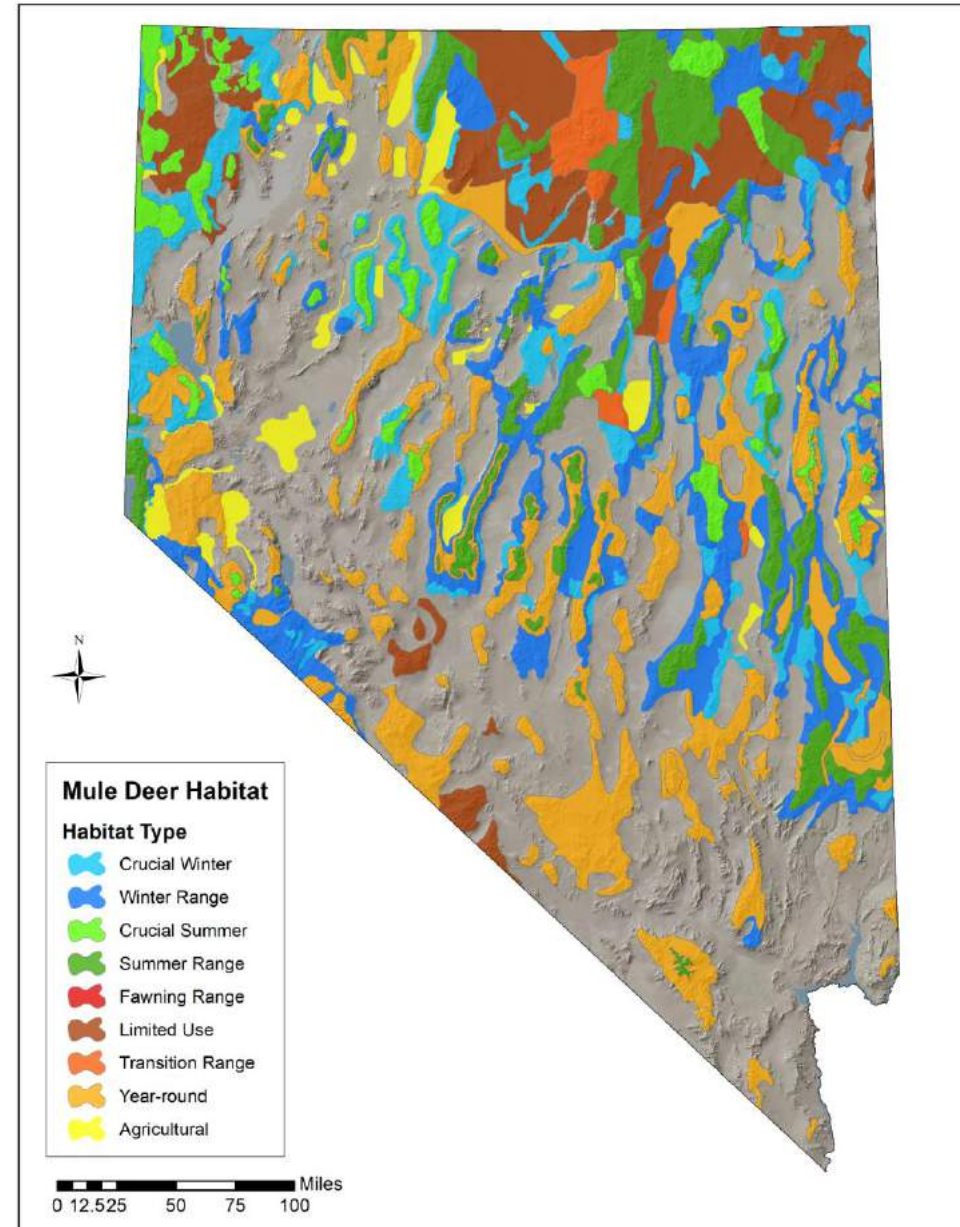


<https://gis-ndow.opendata.arcgis.com/datasets/mule-deer-movement-corridors>

2013 Mule Deer Movement Corridor Mapping

Mule Deer Habitat Maps

updated as of 2014



<https://gis-ndow.opendata.arcgis.com/>

Migration Studies

Beginning in 2011 NDOW began a large-scale radio collaring effort to further quantify migration corridors in Nevada

Initially 3 study areas were identified

- Ruby Mountains
- Simpson Park Mountains
- Carson Front Range - Tahoe Basin

Additional study areas were added due to on-going NEPA and monitoring plans from 2012-present

- Carlin Trend – Area 6
- Pequop Mountains
- Central Nevada (Area 13, Area 14)
- Northern Washoe County
- Spring Mountains big game study (SR-160)



Research Article

Overpasses and Underpasses: Effectiveness of Crossing Structures for Migratory Ungulates

NOVA O. SIMPSON,¹ *Natural Resources and Environmental Science, University of Nevada, Reno, 1664 N. Virginia St, MS 186, Reno, NV 89557, USA*

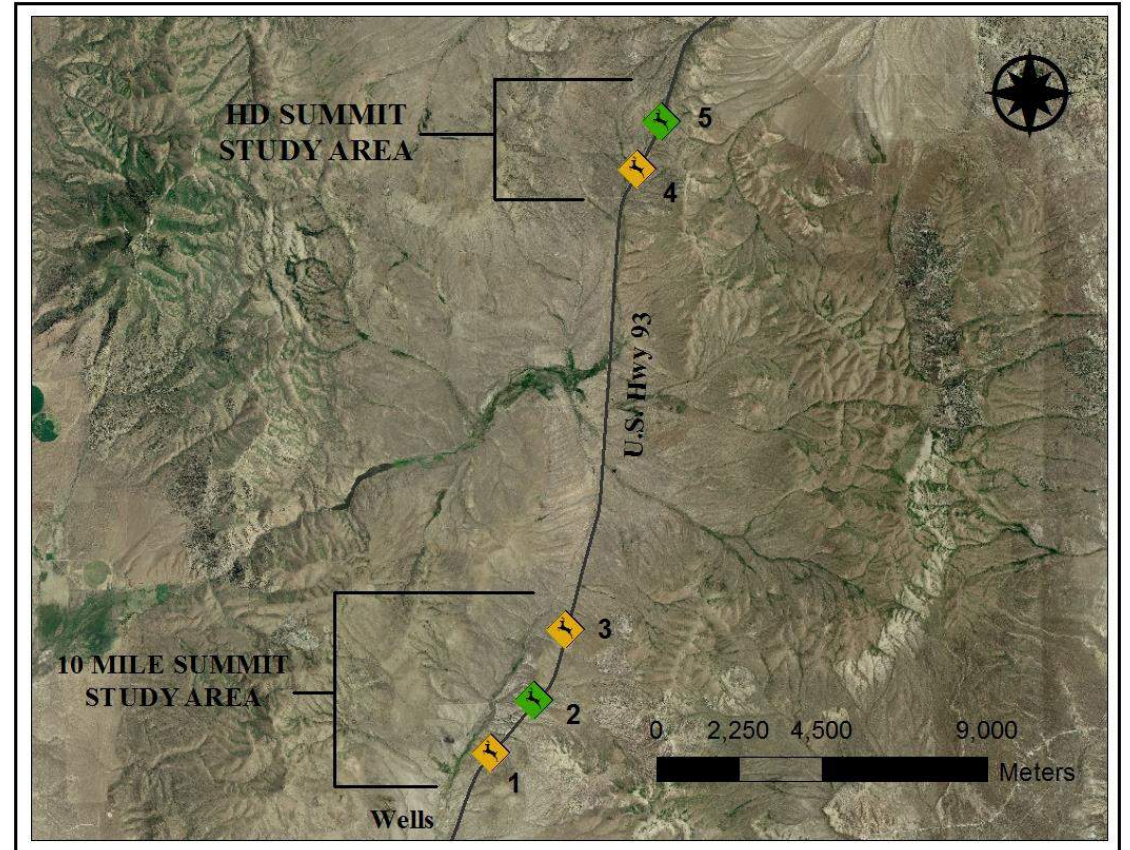
KELLEY M. STEWART,² *Natural Resources and Environmental Science, University of Nevada, Reno, 1664 N. Virginia St, MS 186, Reno, NV 89557, USA*

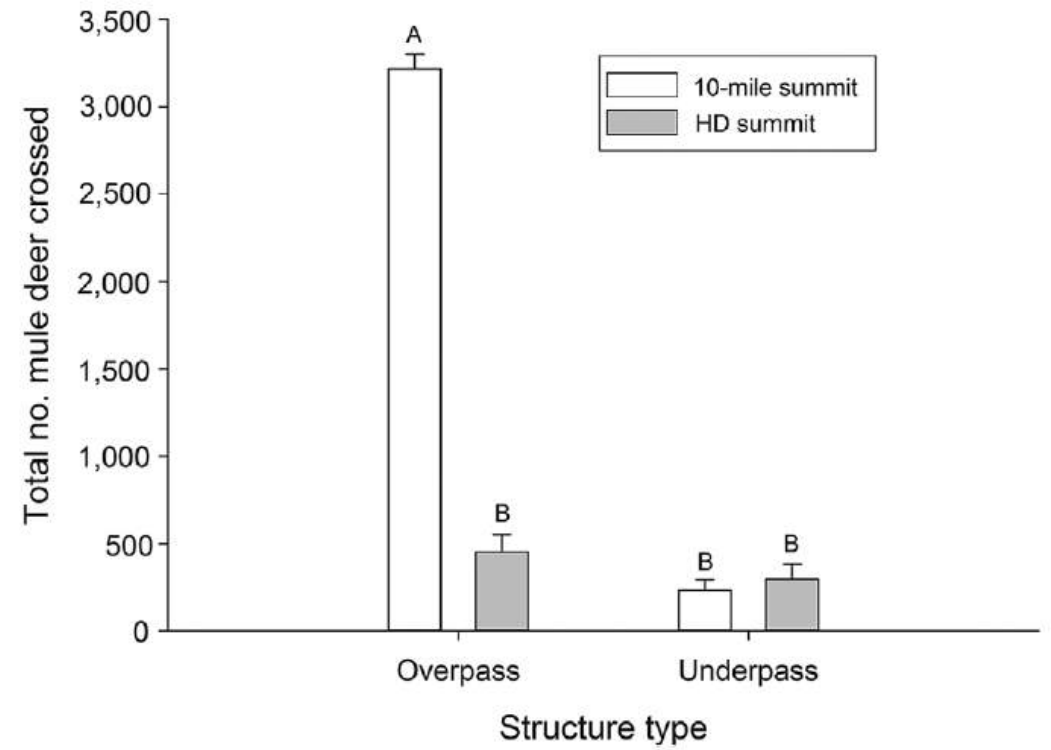
CODY SCHROEDER, *Nevada Department of Wildlife, 6980 Sierra Center Parkway #120, Reno, NV 89511, USA*

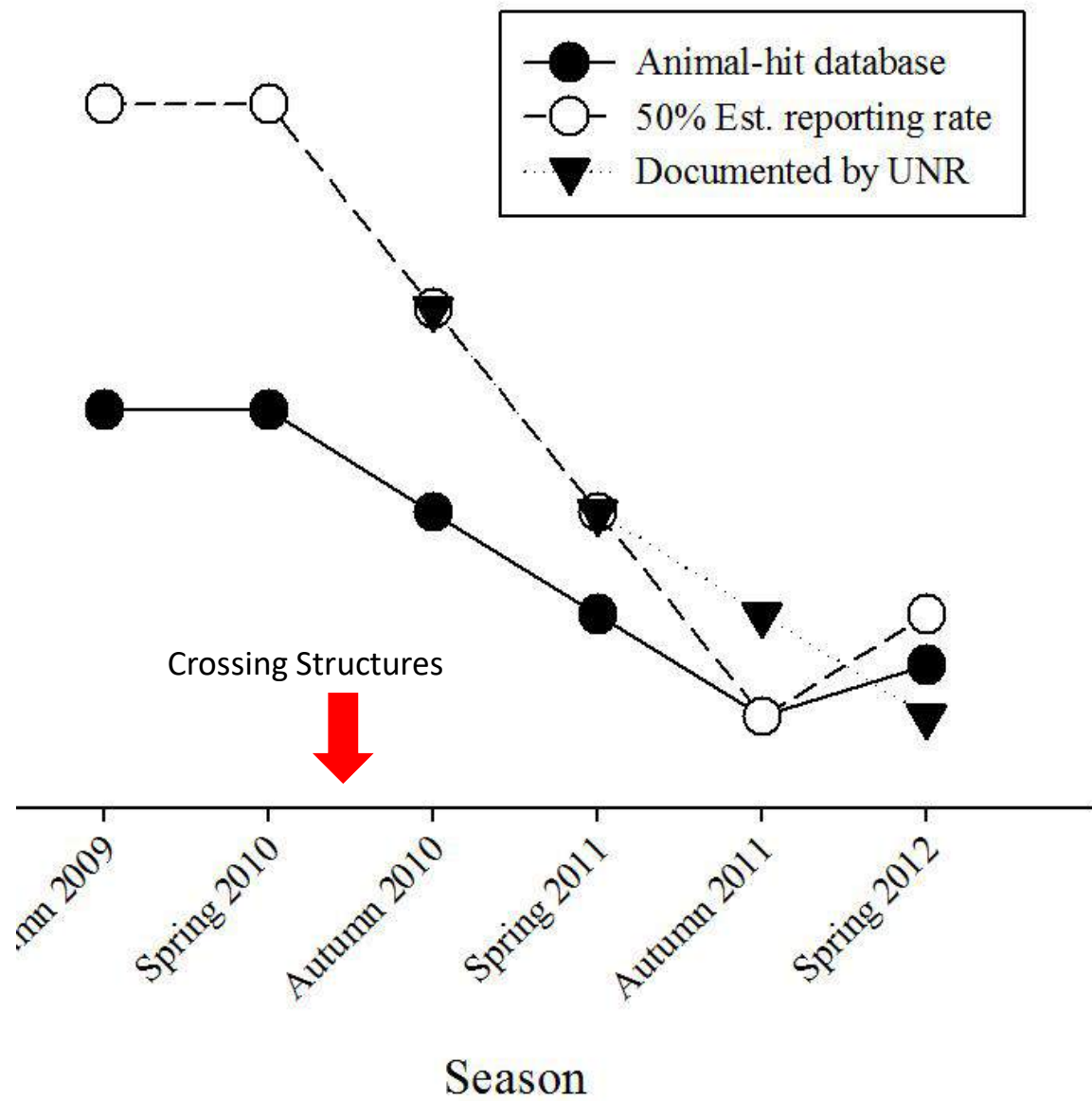
MIKE COX, *Nevada Department of Wildlife, 6980 Sierra Center Parkway #120, Reno, NV 89511, USA*

KARI HUEBNER, *Nevada Department of Wildlife, 6980 Sierra Center Parkway #120, Reno, NV 89511, USA*

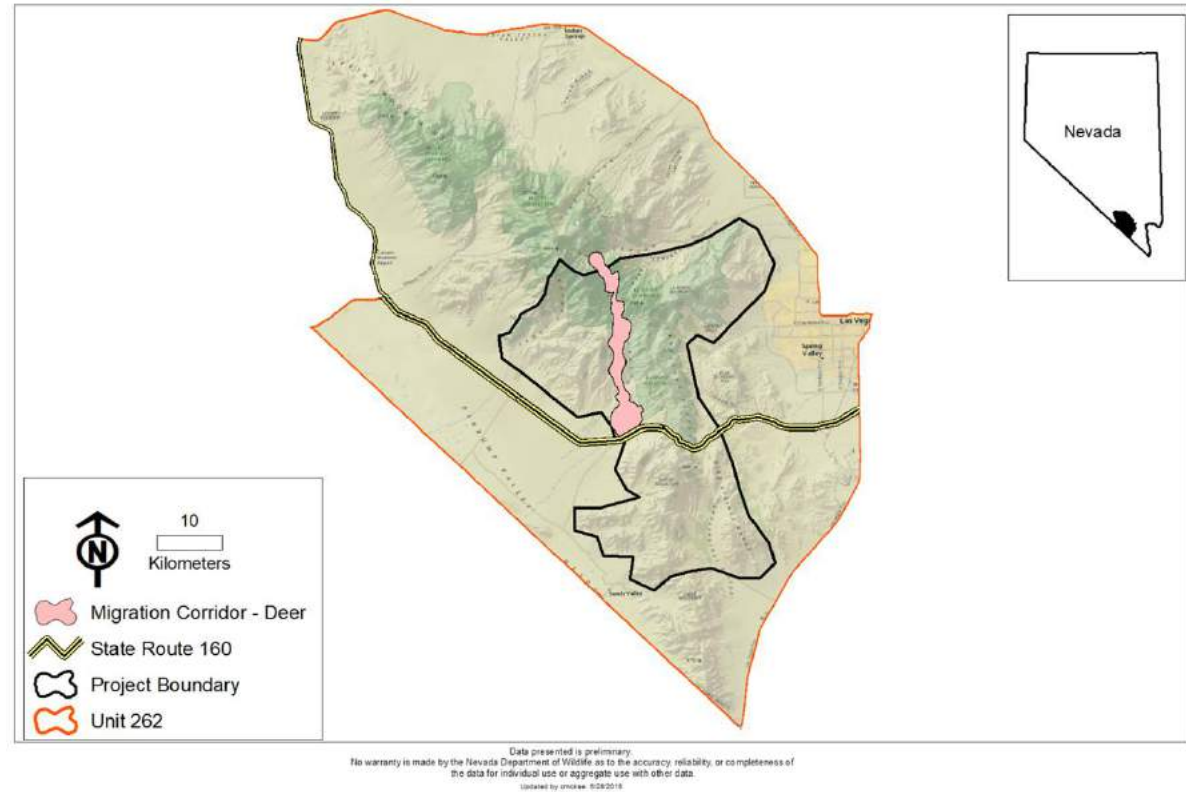
TONY WASLEY, *Nevada Department of Wildlife, 6980 Sierra Center Parkway #120, Reno, NV 89511, USA*

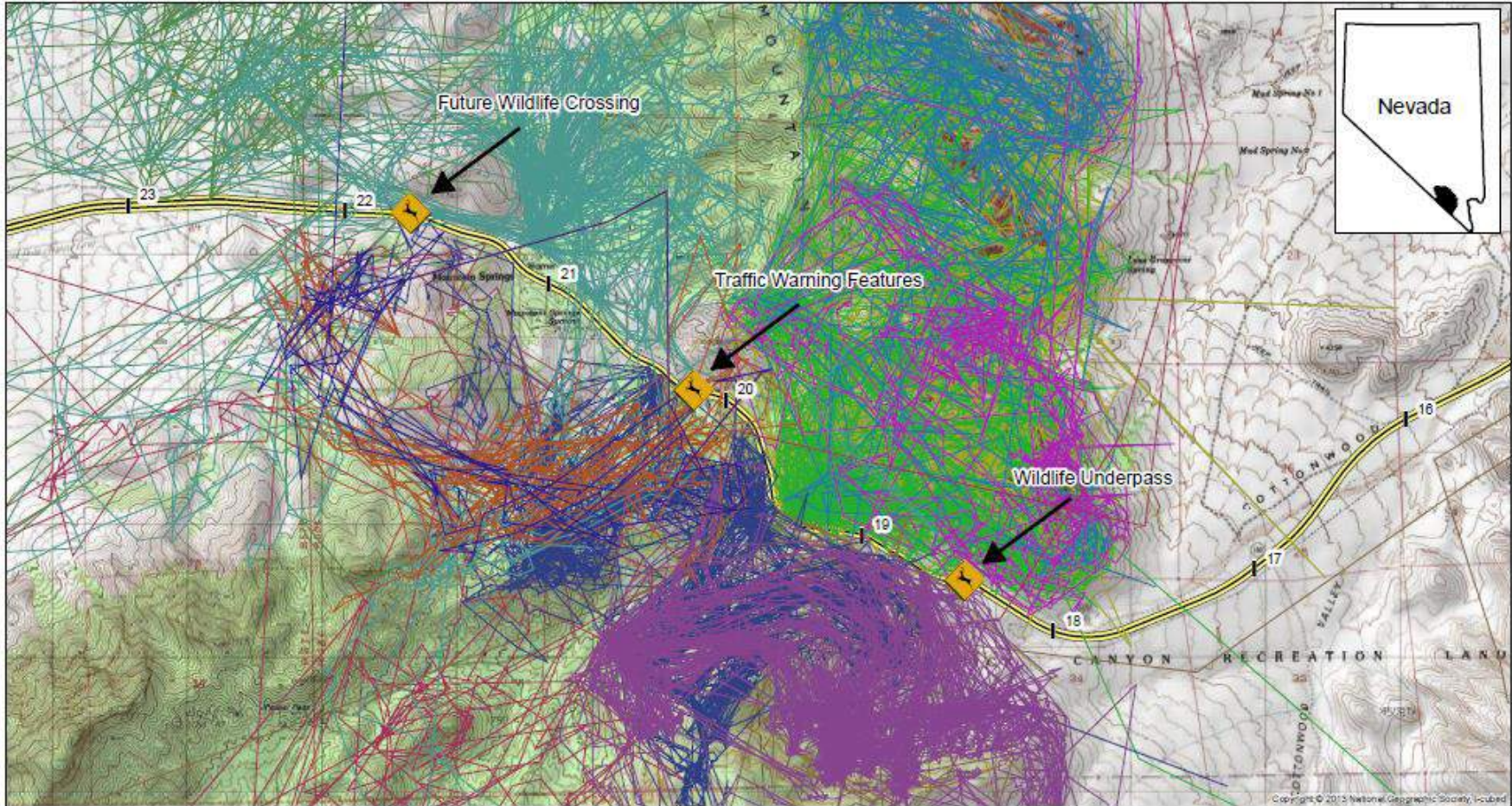






Wildlife Safety Features – SR 160



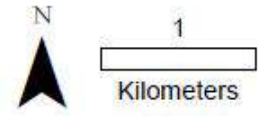


Documented Movements of Big Game Crossing SR160, Nov. 2015 to Aug. 2017



- | | | | | | |
|-----------|-------|-------|-------|-------|-----------------|
| Animal ID | 10308 | 10315 | 10333 | 10867 | |
| | 10302 | 10312 | 10319 | 10336 | State Route 160 |
| | 10304 | 10314 | 10326 | 10863 | Mile Post |

Data presented is preliminary.
 No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.



Updated by cmckee: 9/27/2017

SR 160 Study - Important Findings

- 12 of 58 study animals have successfully crossed SR 160 (21%).
- Crossings or attempted crossings most frequently occurred at mileposts 18.5, 20, and 22.
- Male mule deer and bighorn sheep were more likely to cross and did so more frequently than females.
- At least one collared animal (mule deer) was hit on SR-160 during study, possibly another collared deer hit near MP 21

Policy and regulation

- SO 3362
- State Wildlife Action Plans
- Migration Corridors
- NEPA
- Monitoring Plans for Mule Deer



Secretarial Order 3362

- Signed by Secretary of Interior February 2018
- Provided a framework for cooperation between local, state, and federal agencies
- Each state tasked with developing a plan to identify and prioritize migration corridors and winter range for big game
 - Mule deer
 - Pronghorn
 - Elk
- Funding for research to collect data and map corridors where knowledge gaps occurred



Challenges to Migration

Identified following challenges:

- Barriers and impediments to movement corridors
- Increased traffic on roadways
- Residential development
- Wildfire and changing habitat dynamics
- Invasive species
- Drought conditions
- Impacts to “stop-over” habitats



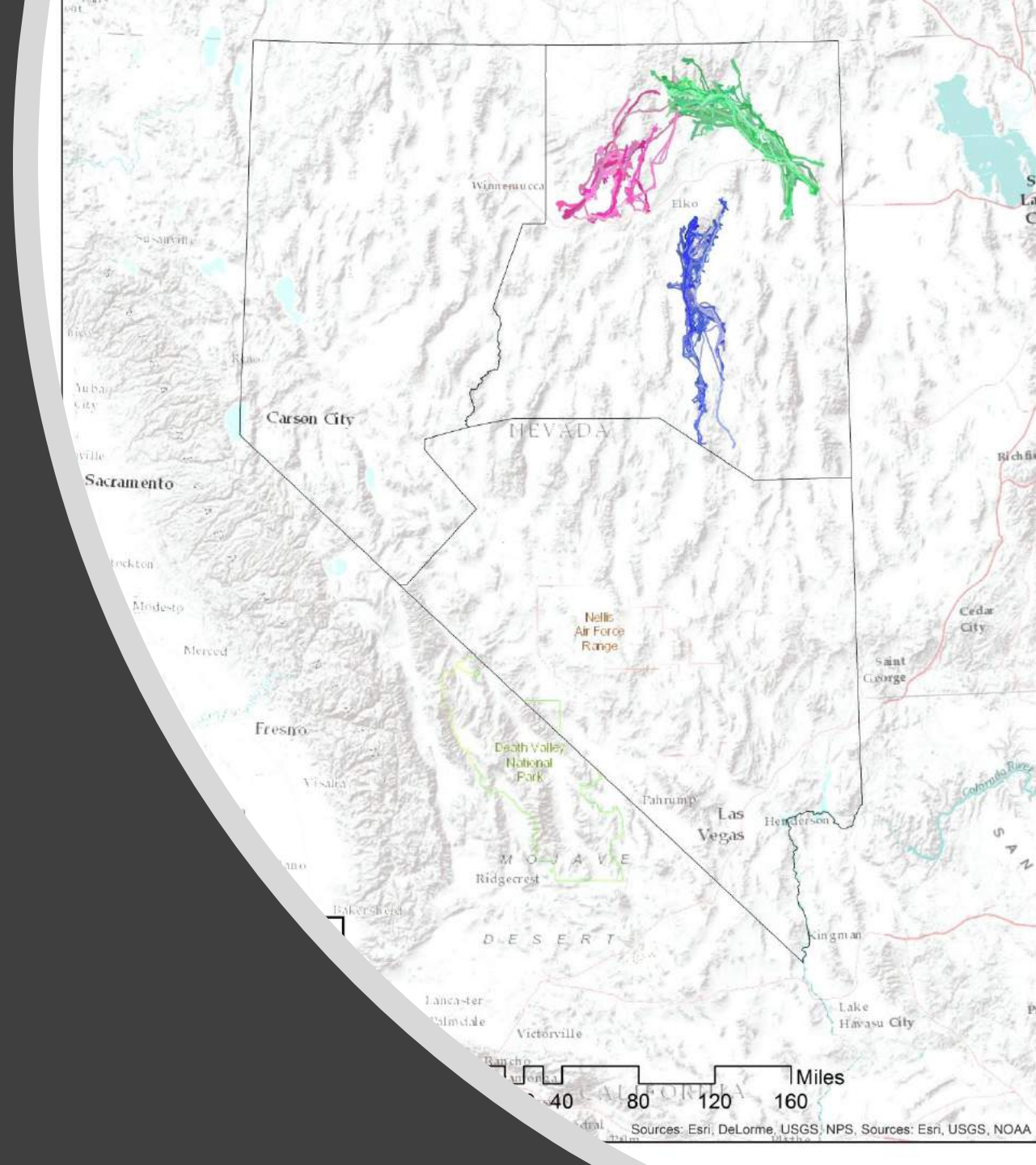
Nevada State Action Plan 2018

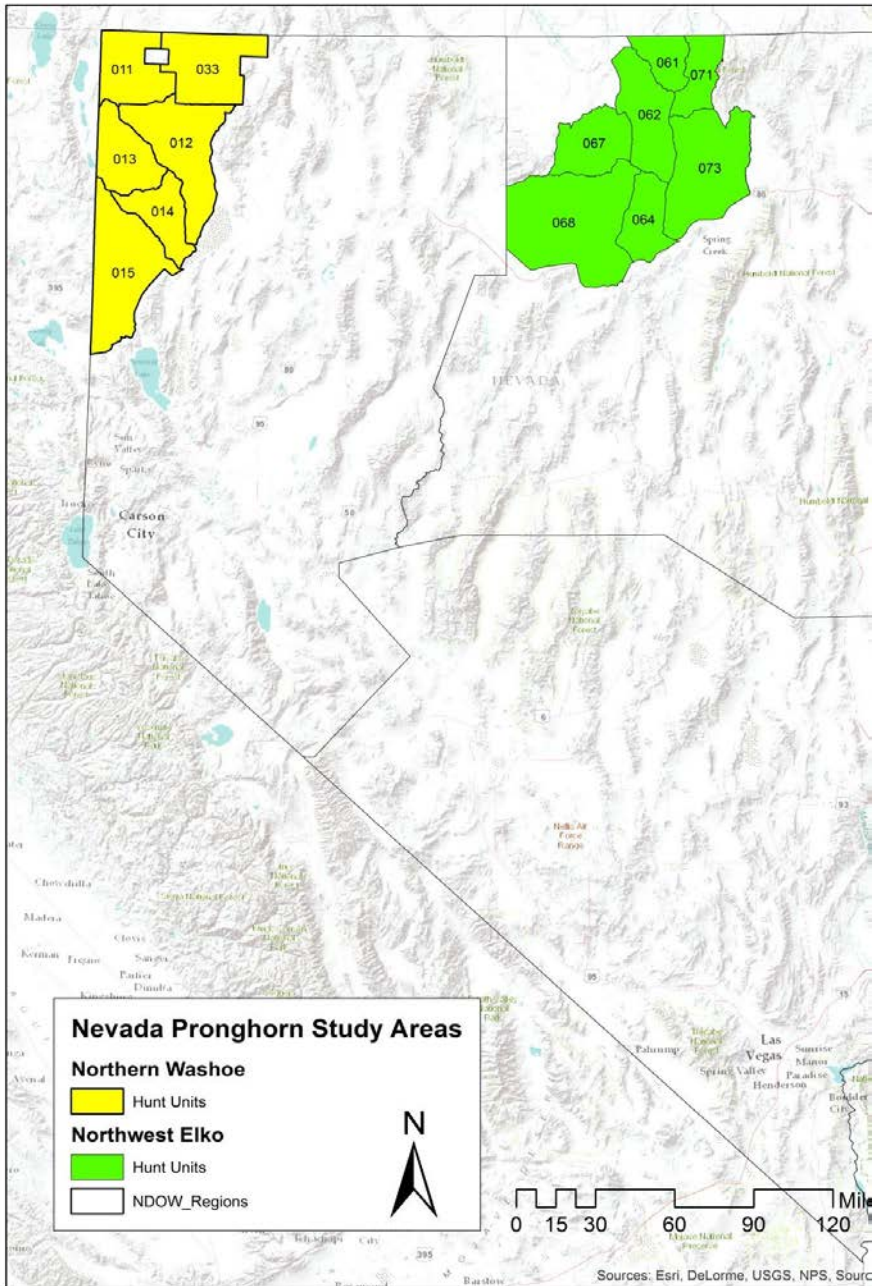
Top 3 priority migrations for mule deer

- Area 6 Independence – Tuscarora Mtns
- Area 7 Pequop Mountains
- Area 10 Ruby Mountains

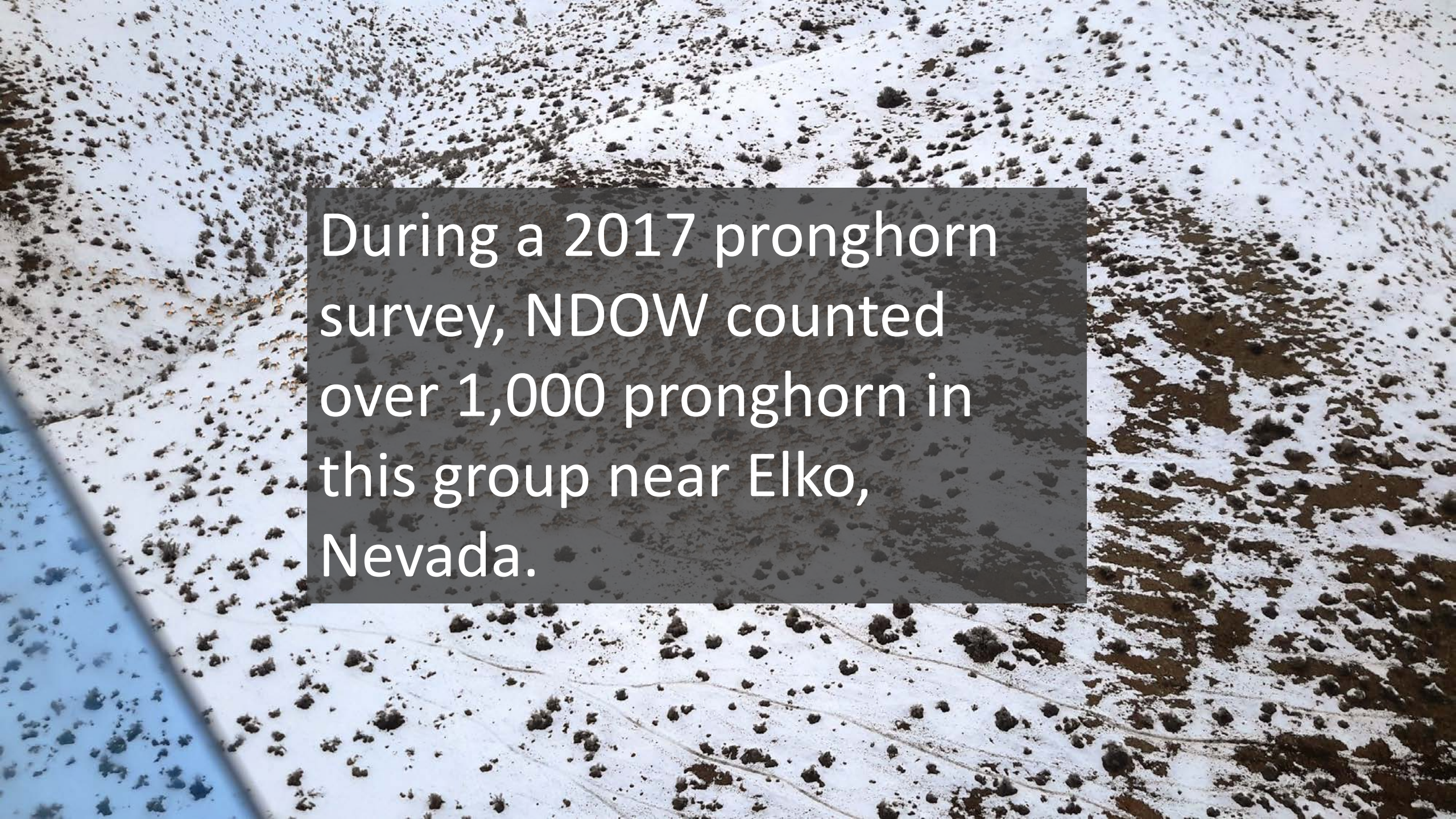
Top research needs

- Mapping pronghorn migration corridors
- Analysis of existing mule deer telemetry data using best available science





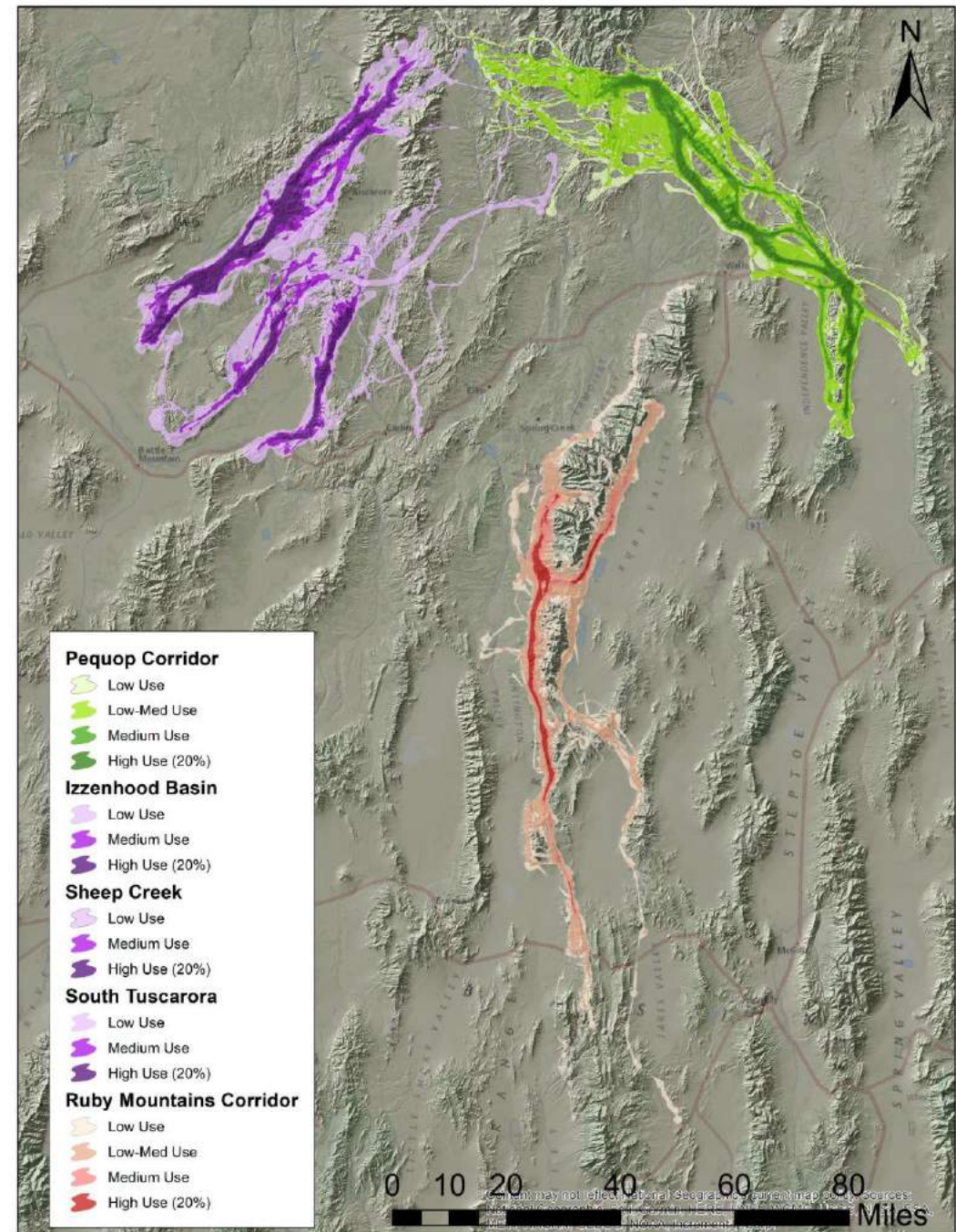
Pronghorn Migration Study Areas

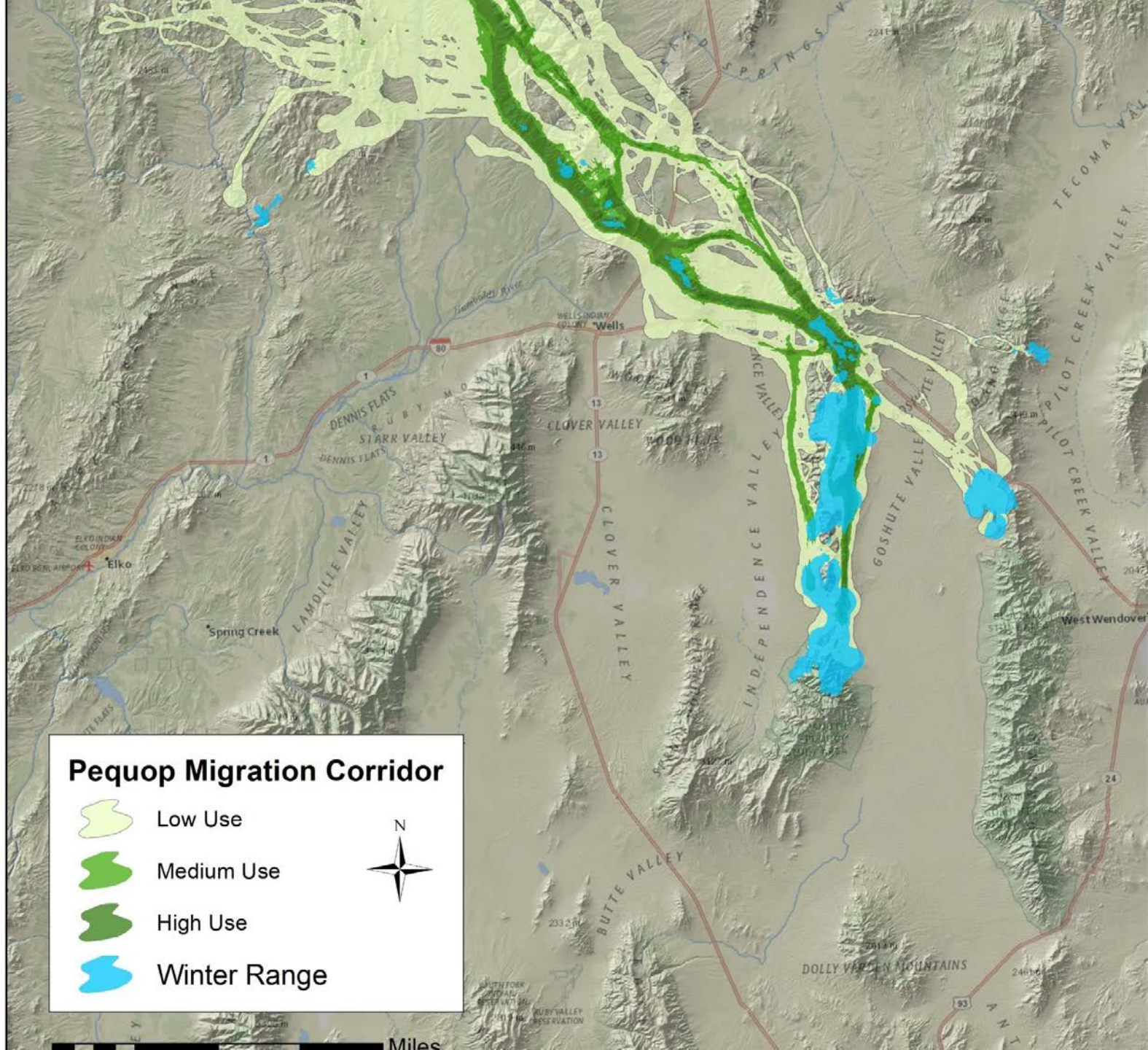
An aerial photograph of a vast, arid desert landscape. The terrain is a mix of light-colored sand and soil with scattered dark, scrubby vegetation. A large herd of pronghorn is visible, appearing as a dense cluster of small, dark spots in the lower-left quadrant. A semi-transparent dark grey rectangular box is overlaid on the center of the image, containing white text. The text reads: "During a 2017 pronghorn survey, NDOW counted over 1,000 pronghorn in this group near Elko, Nevada."

During a 2017 pronghorn survey, NDOW counted over 1,000 pronghorn in this group near Elko, Nevada.



Migration Corridor Mapping USGS





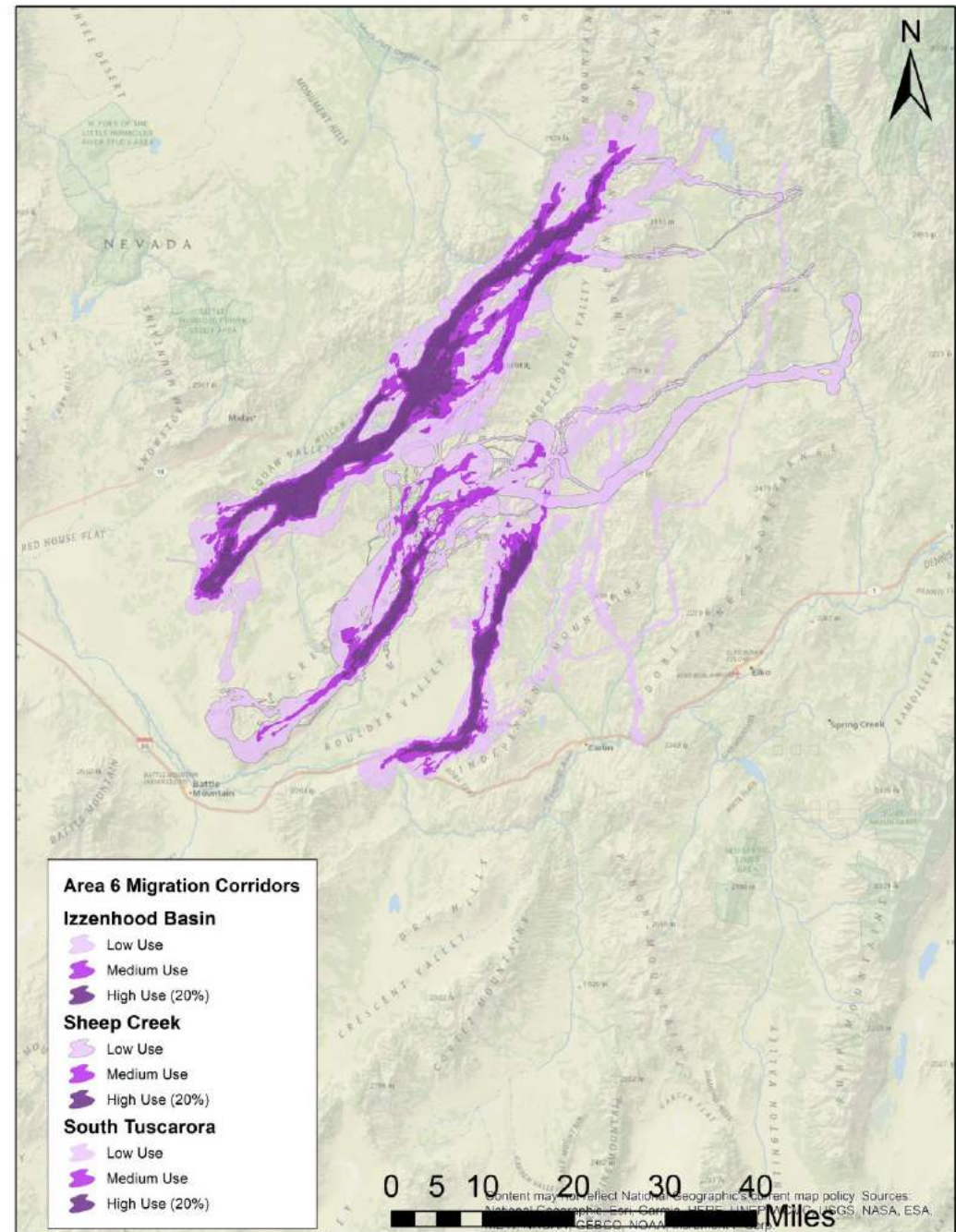
Brownian Bridge Movement Model

Winter Range Maps
Pequop Herd

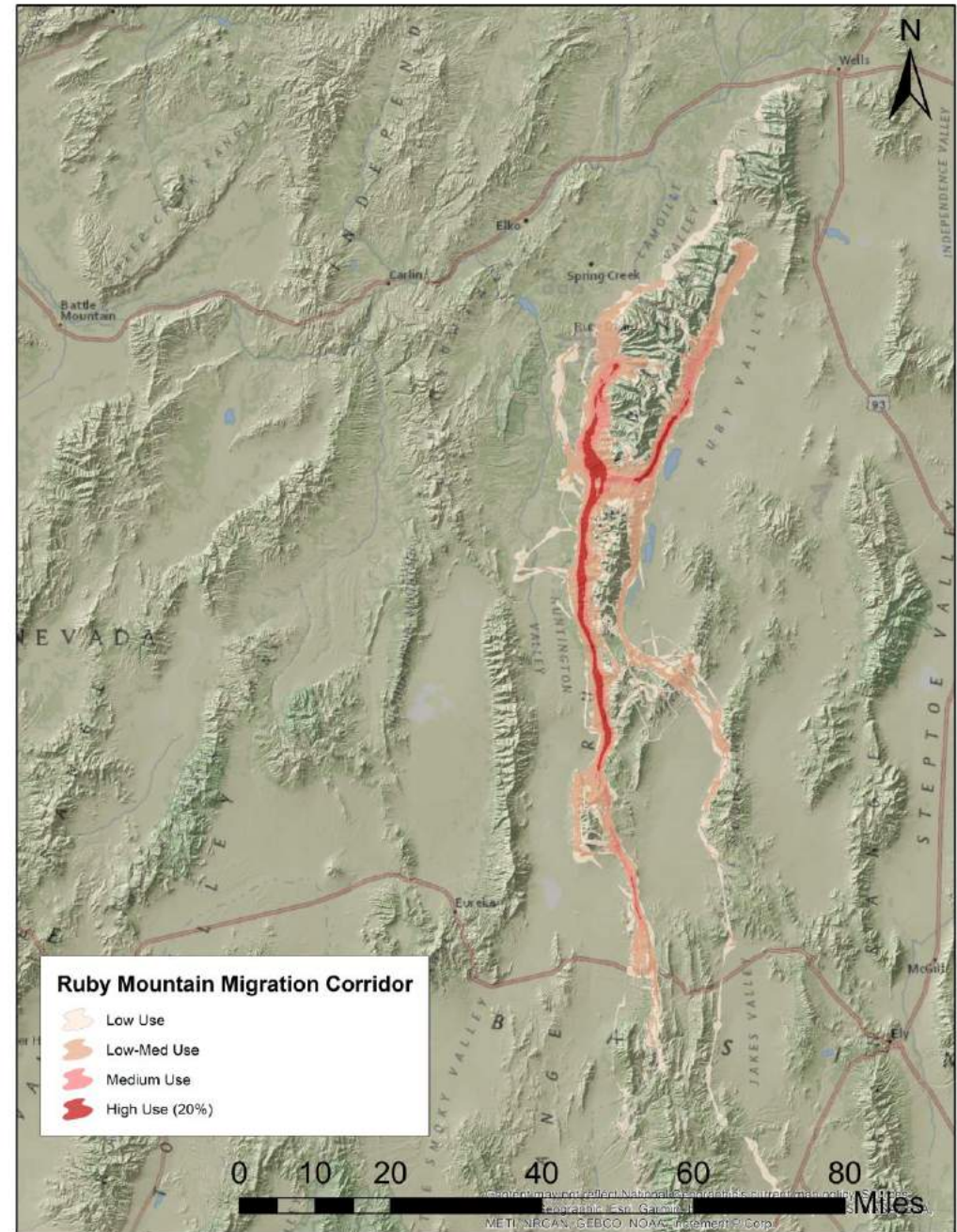
Data from 2012- 2019

67 individuals
218 migration
sequences

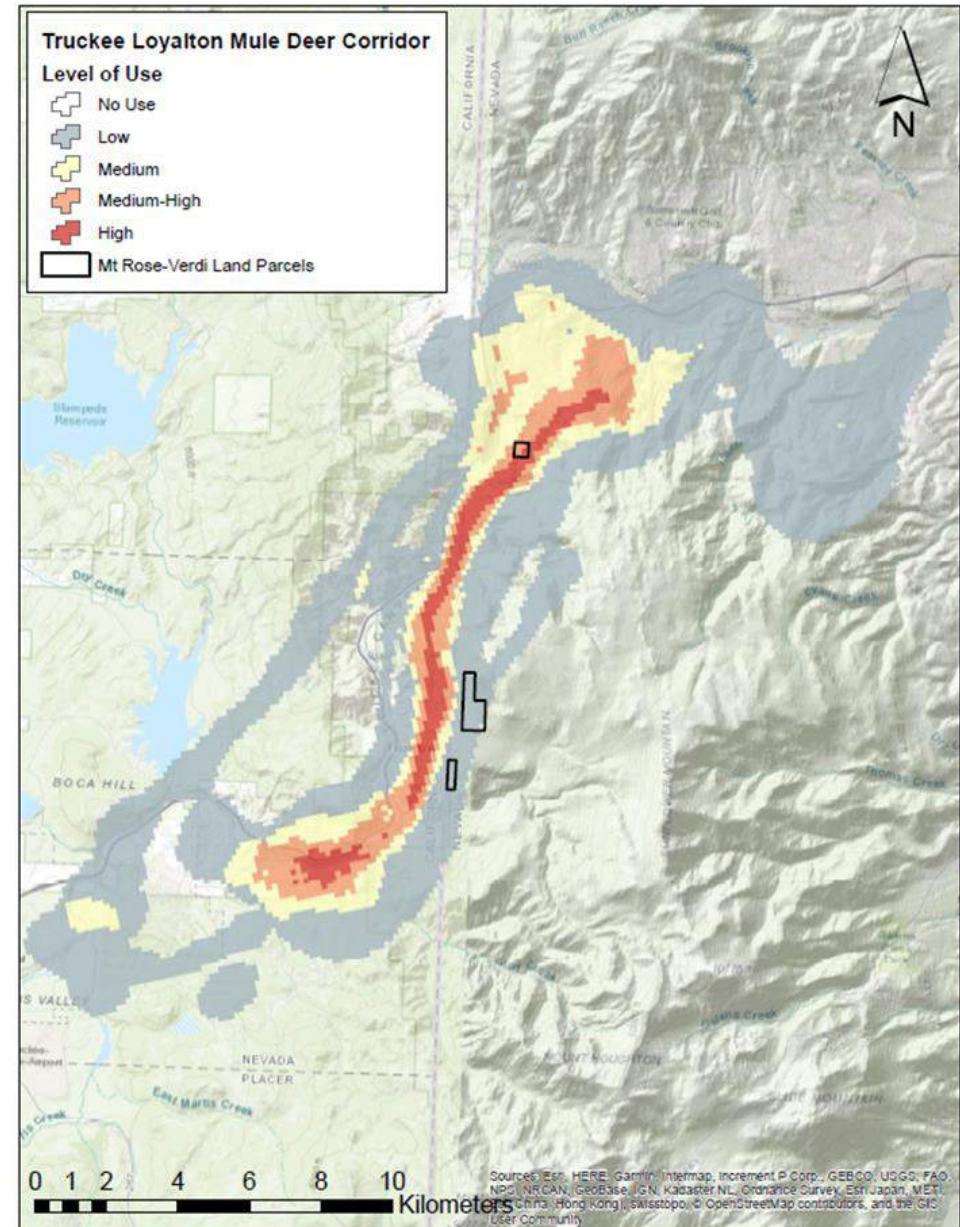
Area 6 Migration Corridors



Ruby Mountain Corridor



Truckee-Reno Mule Deer Corridor



Implications for policy and planning

Nevada currently has no formal protections for migration corridors for any species

NDOW works with federal agencies (i.e. BLM, USFS) on National Environmental Policy Act (NEPA) processes
Provide technical review of EA, EIS, to assess impacts to wildlife movements and migration corridors

NDOW has several monitoring projects for mule deer to assess any potential impacts and ensure safe passage of movement corridors

Mining Mitigation and Monitoring Plans

Long Canyon Mule Deer Monitoring Plan

- Pequop migration corridor
- Record of Decision (ROD) signed 2014
- Mule Deer Monitoring Plan

Bald Mtn Mule Deer Monitoring Plan

- Record of Decision signed 2016
- MOU between NDOW, BLM, Kinross Gold Corporation signed 2016
- MOU outlines a plan to implement Mule Deer Monitoring Plan for 5 years
- Plan obligates seasonal monitoring of up to 30 GPS radio collars
- Adaptive management framework
- Triggers to ensure efficient passage of mule deer through mine boundary

Mule Deer Restoration and Research Projects

- \$25 million dollars spent on sagebrush habitat restoration by Heritage Program since 1996
- Benefits mule deer and many other wildlife species
- Over 800 mule deer radio-collared by NDOW since 2010
- Currently monitoring ~185 GPS collars
- Map crucial habitat and corridors
- Survival rates
- Collect information on body condition





Thank You!



Animals & Roadways; Science, Infrastructure, and Education

**Nova Simpson
Nevada Department of Transportation
Environmental Services Division**

Environmental Services



Air Quality

Biological Resources

Cultural Resources

Hazardous Materials

Socio/Economic Impacts

Storm Water Division

Traffic Noise



Environmental Services

Primary Purpose is Environmental Compliance

Federal Laws

National Environmental Policy Act (NEPA)

Endangered Species Act (ESA)

State Laws

State Protected Species Statutes

State Noxious Weed Statutes



Road Ecology



**Interaction of Wildlife and Roads
Ability to Move, Access Resources, Behaviors, Gene Flow**

Collaboration

Primary Goals and Objectives

Transportation

Provide safe and effective transportation corridors.



Animal-Vehicle Collisions

Natural Resource

Manage habitat, land-use, or wildlife populations.



Habitat Connectivity

Overlapping Interests



Statewide Prioritization of Animal-Vehicle Conflicts

Project Manager

Nova Simpson

NDOW Staff

Brian Wakeling

Cody Schroeder

NDOT Staff

Chris Young

Paul Harmon

Tara Smaltz

Lee Bonner

Research Team

Dr. Patricia Cramer

Ellie Leydsman McGinty

Dr. Fraser Shilling

Chris Gerrard

PD Kiser

Manju Kumar

Ken Chambers

Mark Costa

Chris Wright

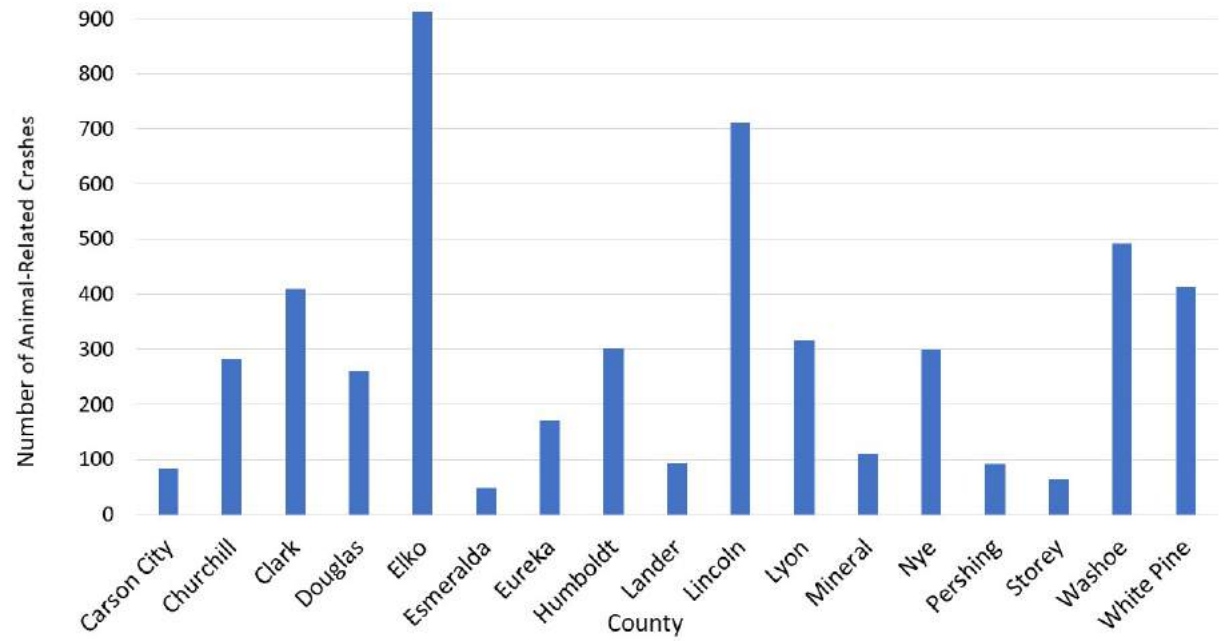
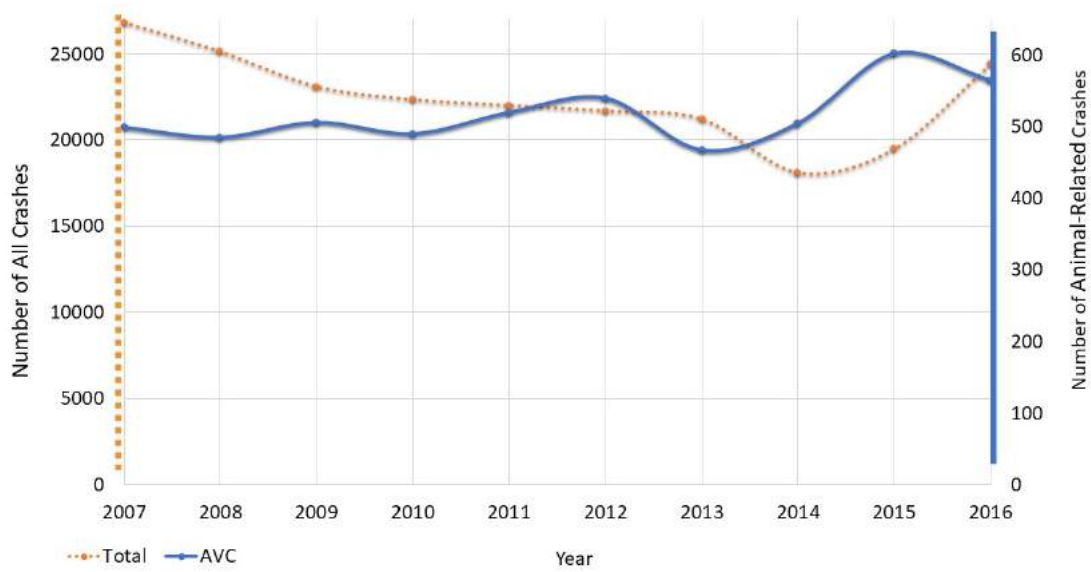
Jason Gonzalez

Nick Bacon

Ken Mammen

Objectives

- 1. Summarize NV crash data**
- 2. Merge Data from NDOT and NDOW**
- 3. Prioritize Conflict Areas**
- 4. Conduct Benefit-Cost Analyses**
- 5. Create GIS files of Conflict Areas**
- 6. Provide a Planning Process**
- 7. Provide Description of Potential Funding Sources**
- 8. Utilizing this report for support**



Percent of Accidents Related to Animals in the Roadway

3

2

District 1 = 0.96

District 2 = 4.28

1

District 3 = 16.22

Percent of Accidents Related to Animals in the Roadway

County	%
Carson City	3
Churchill	10.5
Clark	0.3
Douglas	5.6
Elko	14.7
Esmeralda	7.7
Eureka	15.5
Humboldt	16.6
Lander	13.5
Lincoln	46.5
Lyon	10.6
Mineral	15
Nye	9.9
Pershing	10.8
Storey	14.1
Washoe	1.8
White Pine	23.8
Totals	2.4

Type of Animal	Number Crashes Reported with Each Species 2006-2016				
	Fatal	Injury	Property Damage Only	Total	Comments
Deer	1	238	2,479	2,718	.03% = fatal 9% caused injuries
Cow (Cattle)	2	141	661	804	0.2% = fatal 18% caused injuries
Horse	5	76	276	357	1.4% = fatal 21% caused injuries
Dog/Coyote	3	77	304	384	0.7% = fatal 20% caused injuries
Elk	1	34	185	220	0.5% = fatal 15% caused injuries

Animal-Vehicle Annual Crash Costs

Type of Crashes	Total of Type in 11 years 2006-2016	Annual Average	Nevada DOT 2016 Comprehensive Societal Cost Per Occurrence	Total Average Annual Cost
Property Damage Only	4,944	450	\$ 10,221	\$ 4,599,450
Injury Crash Type C or Unknown Severity	383	34.8	\$ 63,434	\$ 2,207,503
Injury Crash Type B	278	25.3	\$ 112,708	\$ 2,851,512
Injury Crash Type A	65	5.9	\$ 308,595	\$ 1,820,711
Fatality	14	1.3	\$ 5,839,241	\$7,591,013
Total	5,683	516	Not applicable	\$ 19,070,189

Prioritization

NDOT Safety Data

Crash Prioritization Maps

Animal

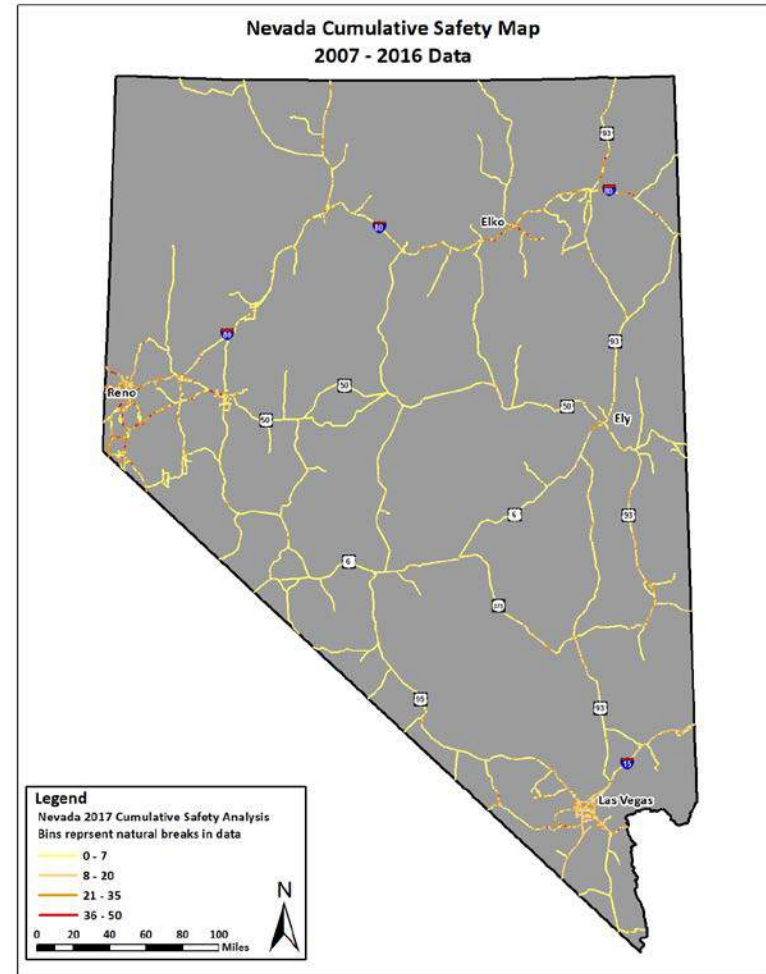
Wildlife

Horse

Cattle

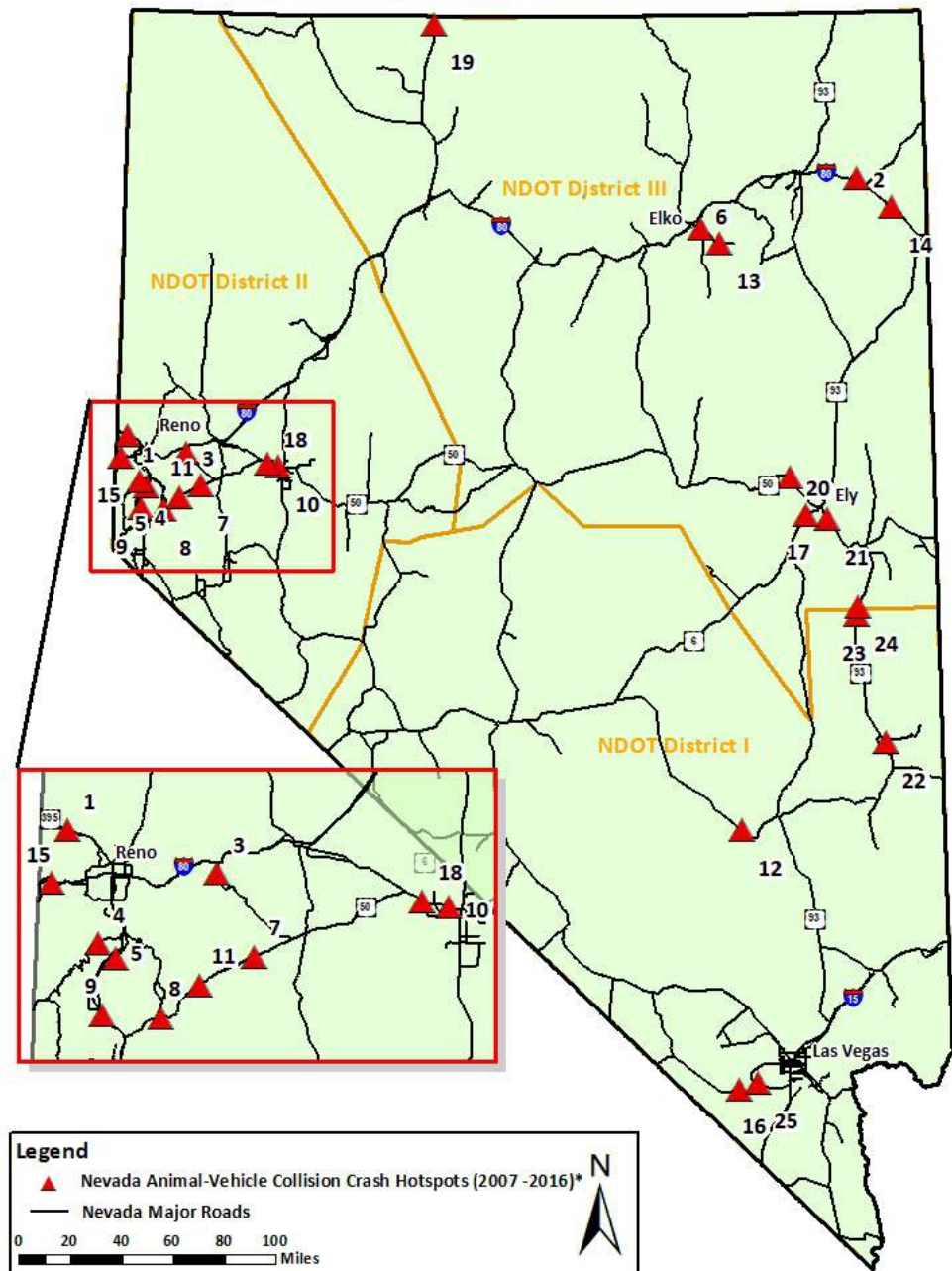
AADT, Carcasses, % AVC

GIS Analysis = Getis Ord



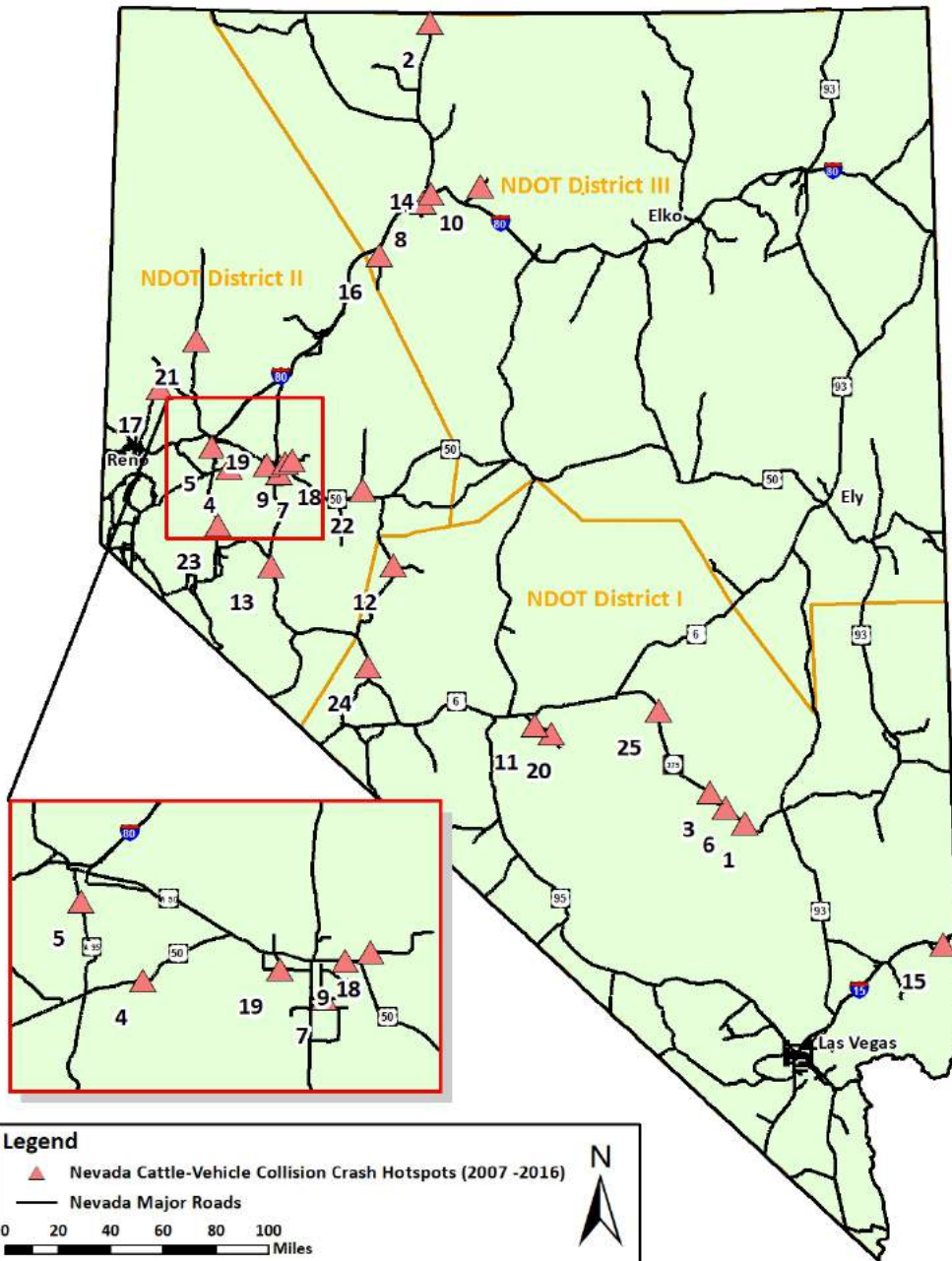


Nevada Animal-Vehicle Collision Crash Hotspots Top 25 Hotspots based on 2007 - 2016 Data



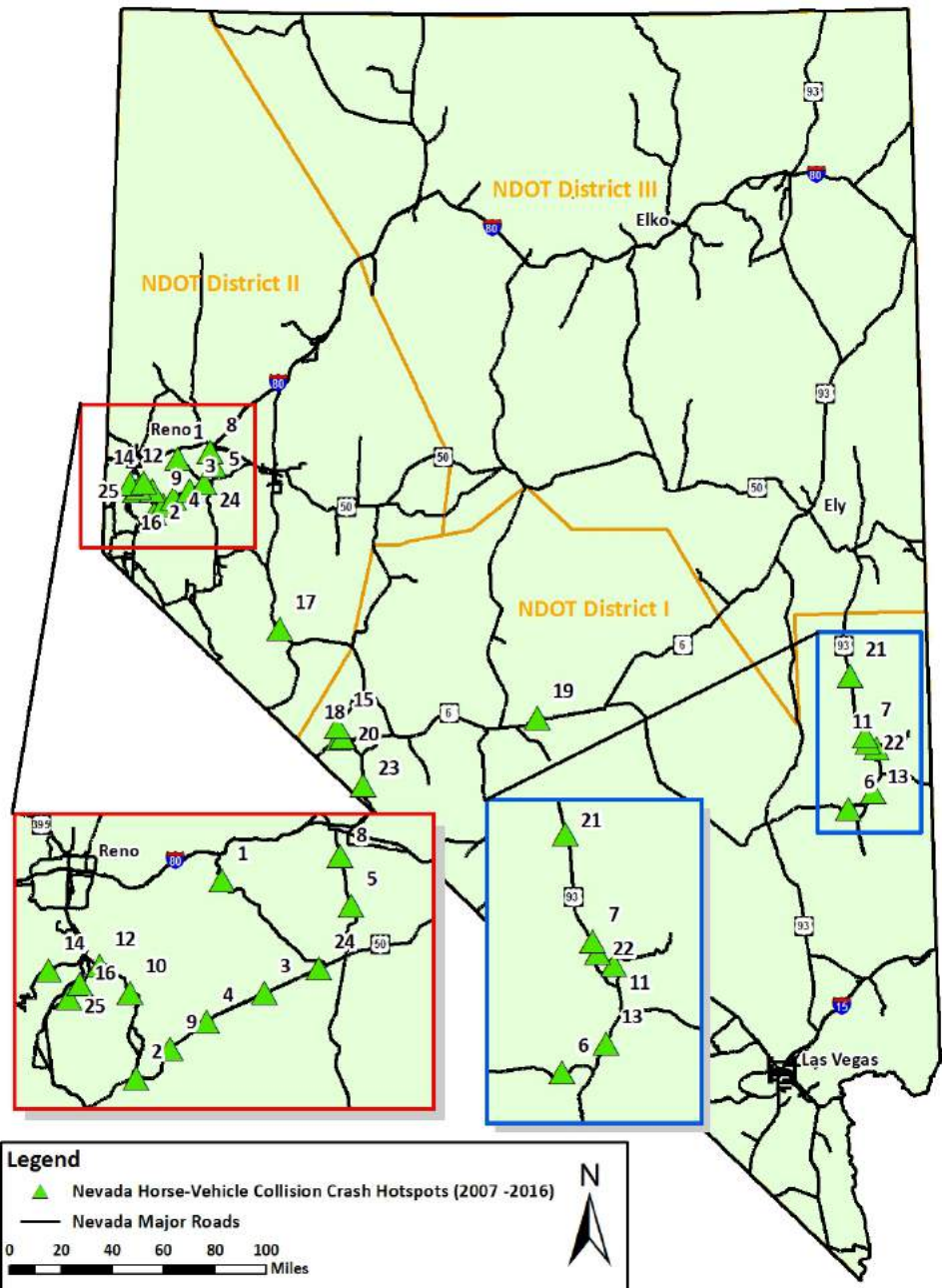
Nevada Cattle-Vehicle Collision Crash Hotspots

Top 25 Hotspots based on 2007 - 2016 Data





Nevada Horse-Vehicle Collision Crash Hotspots Top 25 Hotspots based on 2007 - 2016 Data



Prioritization + Collaboration

NDOT Safety Data

```
graph TD; A[NDOT Safety Data] --- B[Crash Prioritization Maps  
Animal  
Wildlife  
Horse  
Cattle  
AADT, Carcasses, % AVC];
```

Crash Prioritization Maps

Animal

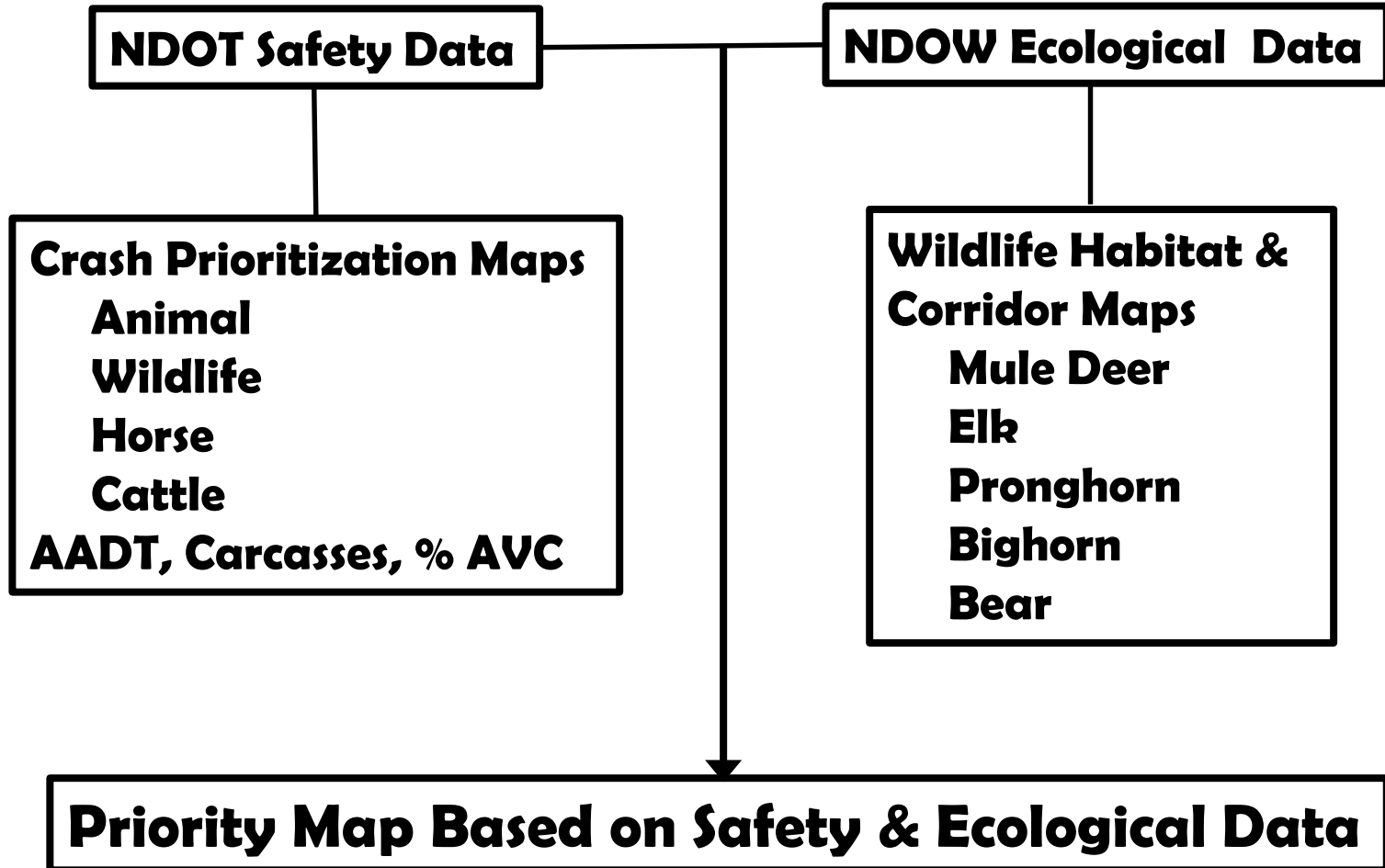
Wildlife

Horse

Cattle

AADT, Carcasses, % AVC

Prioritization + Collaboration



Prioritization with Safety & Ecological Data

Safety Data = 50 Points

- **Animal Crashes**
- **Fatal Animal Crashes**
- **Animal Crashes w Injuries**
- **Number of Carcasses**
- **AADT**
- **Percentage of Crashes
that are Animal Related**

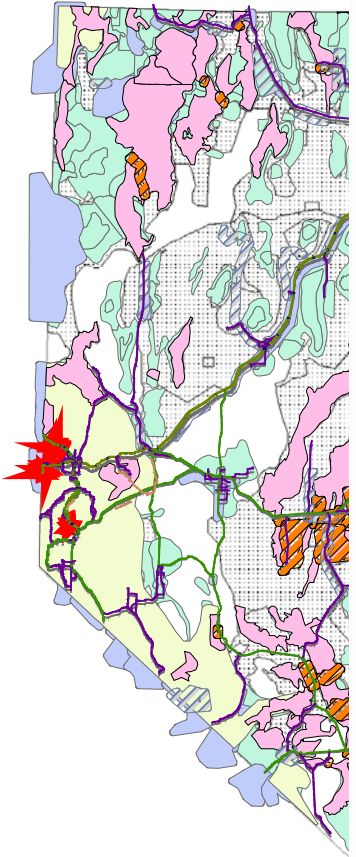
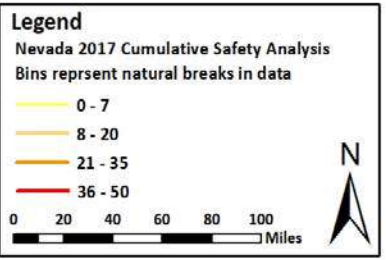
Ecological Data = 50 Points

- **Mule Deer Habitat**
- **Mule Deer Corridors**
- **Elk Habitat**
- **Bighorn Habitat**
- **Bighorn Corridors**
- **Pronghorn Habitat**
- **Bear Habitat**
- **Horse Priority Hotspots**
- **Cattle Priority Hotspots**

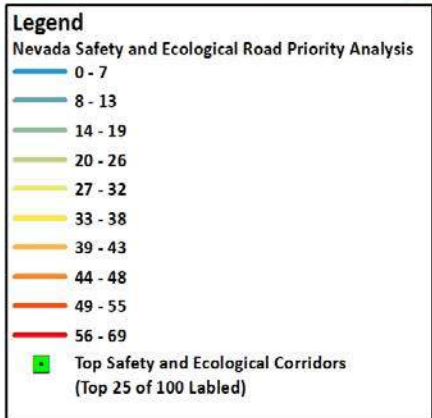
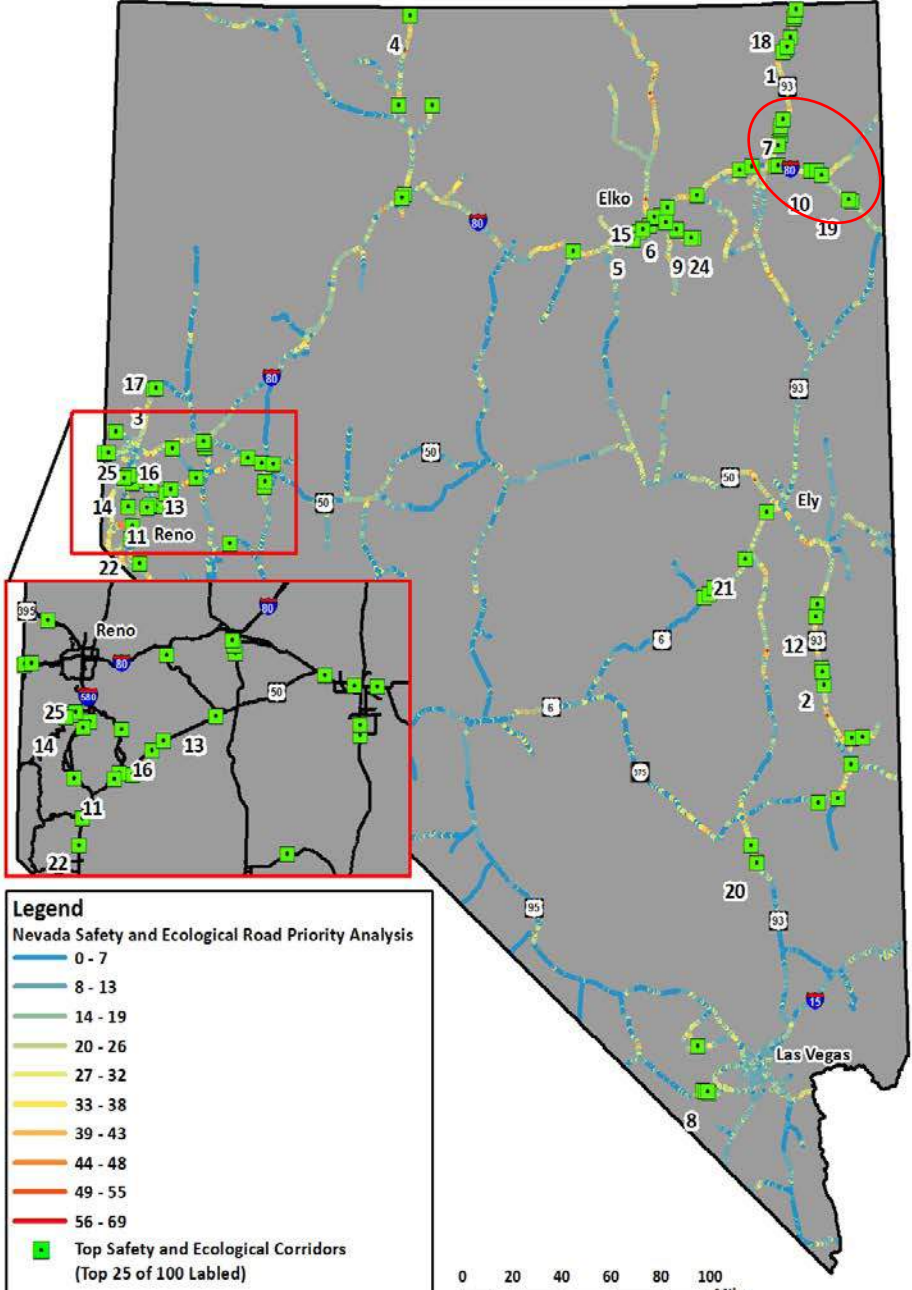
Prioritization with Safety & Ecological Data

Safety Information -GIS Layer		Ecological Information-GIS Layer	
GIS information		Mule deer habitat	5
Number of AVC Crash locations	20	Mule deer movement corridors	5
Number of AVC related human fatalities in location	7	Number of Horses Crashes	10
Number of crashes with human injury	5	Number of Cattle Crashes	10
Number of WVC carcasses	3	Elk distribution	5
AADT	10	Pronghorn distribution	5
Percentage of crashes that are WVC	5	Bighorn sheep habitat	3
Total for Safety map	50	Bighorn movement corridors	5
		Black bear habitat	2
		Total Points for Ecological Map	50

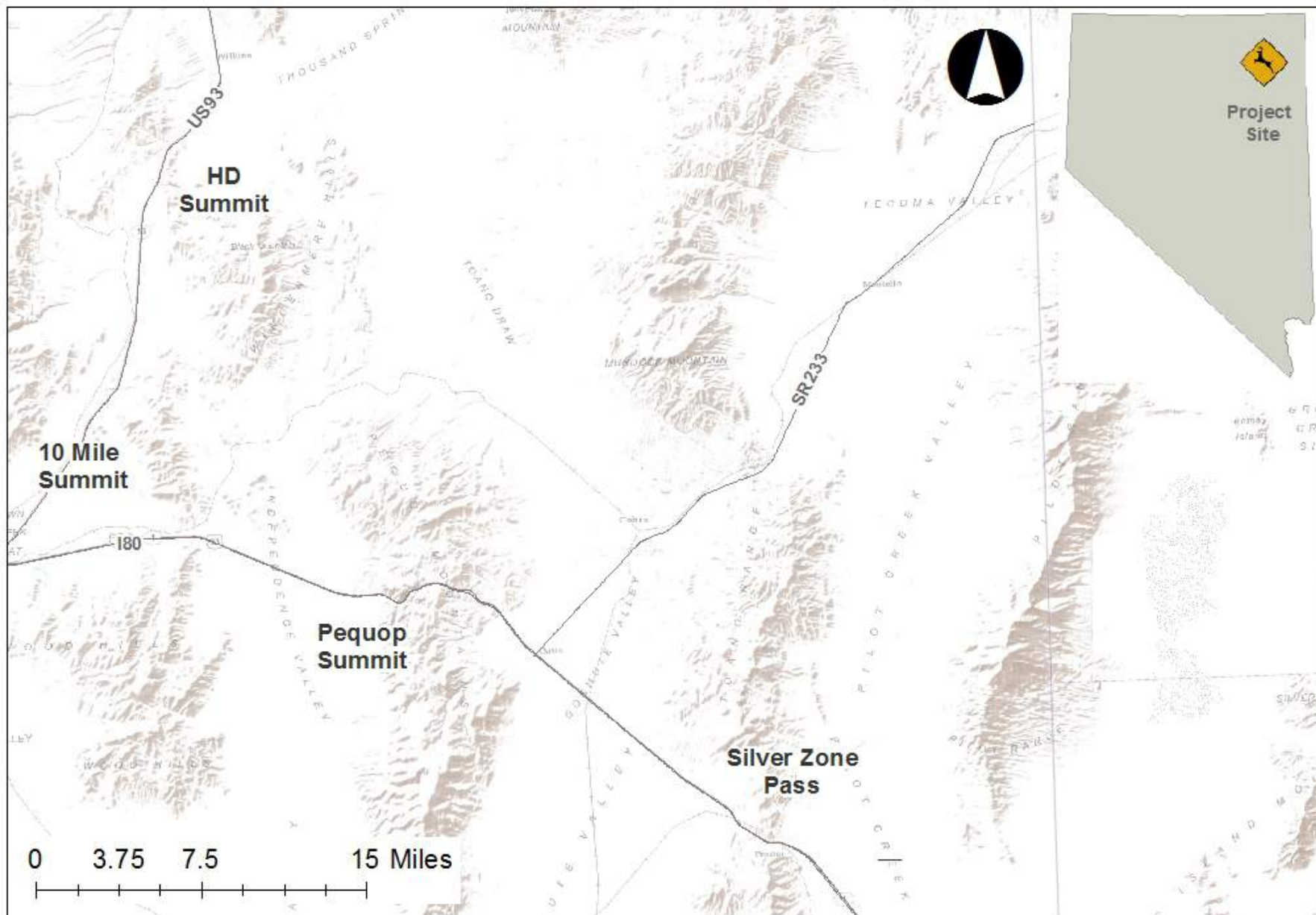
Nevada C
20



Nevada Cumulative Safety and Ecological Road Priority Analysis
Top 100 Safety and Ecological Corridors



Wildlife and Safety Improvements along US 93 and I-80; A Landscape Scale Approach to Habitat Connectivity and Traffic Safety in Elko County, Nevada.

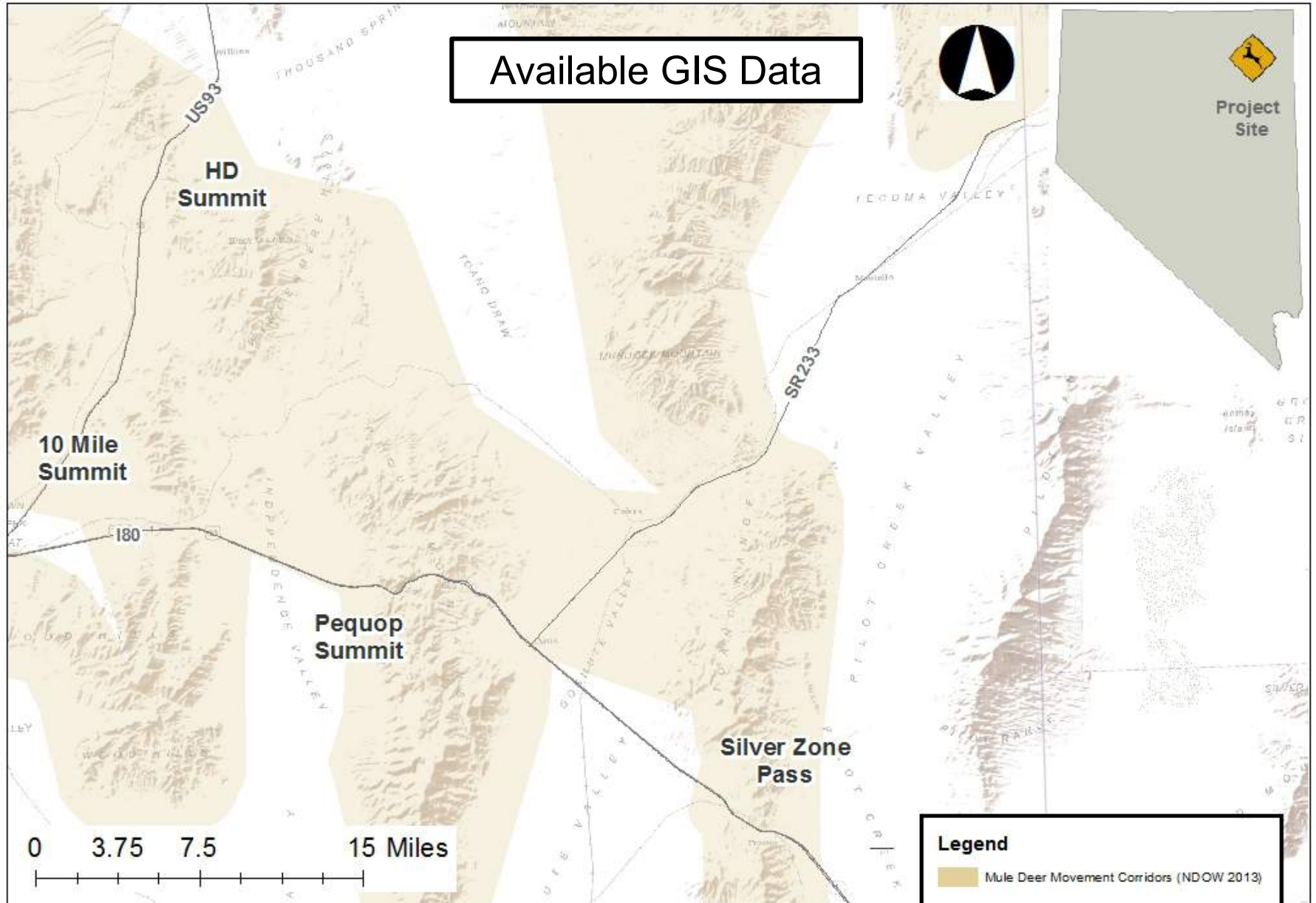


Wildlife and Safety Improvements along US 93 and I-80; A Landscape Scale Approach to Habitat Connectivity and Traffic Safety in Elko County, Nevada.

Available GIS Data



Project Site

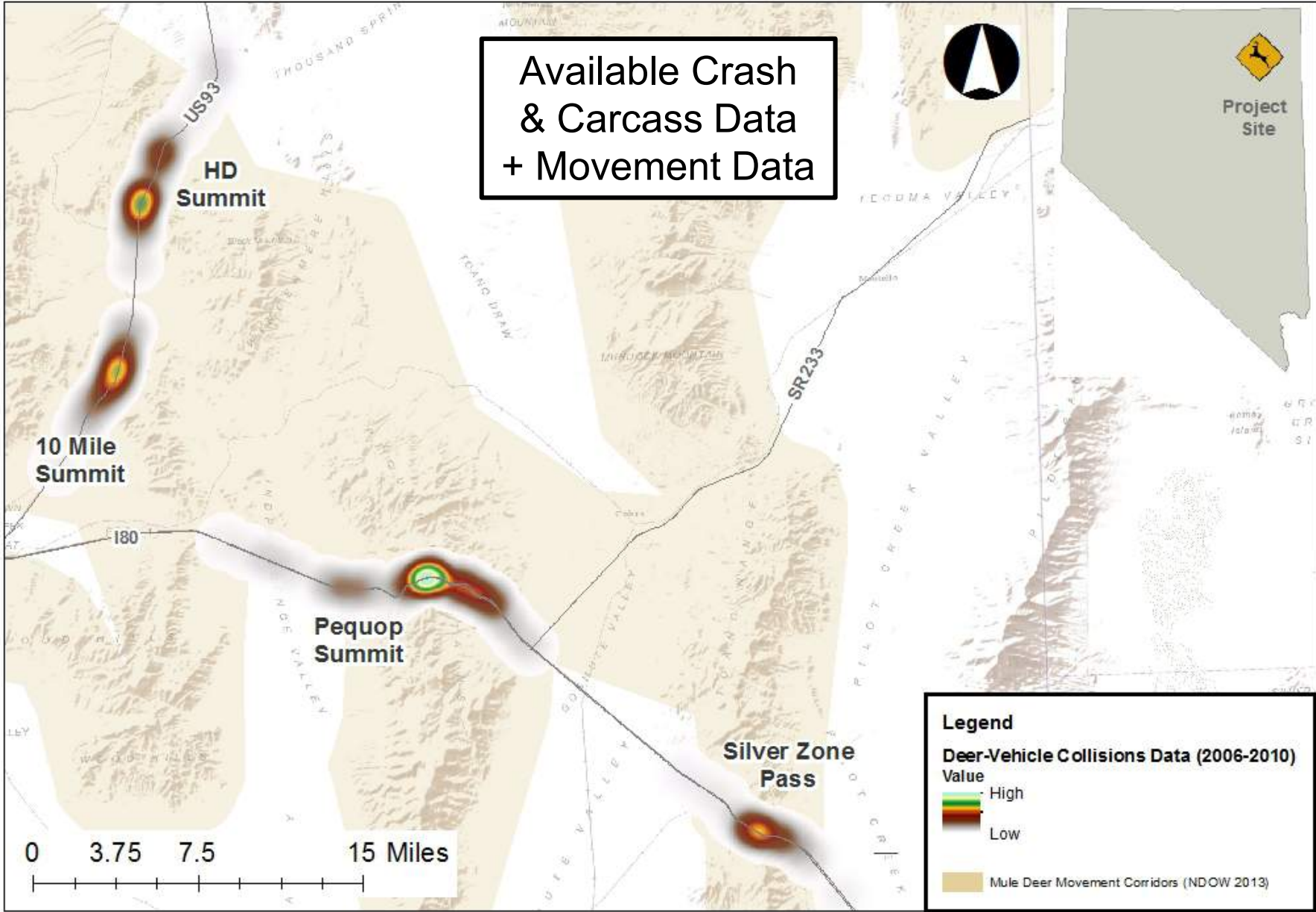


Legend

Mule Deer Movement Corridors (NDOW 2013)

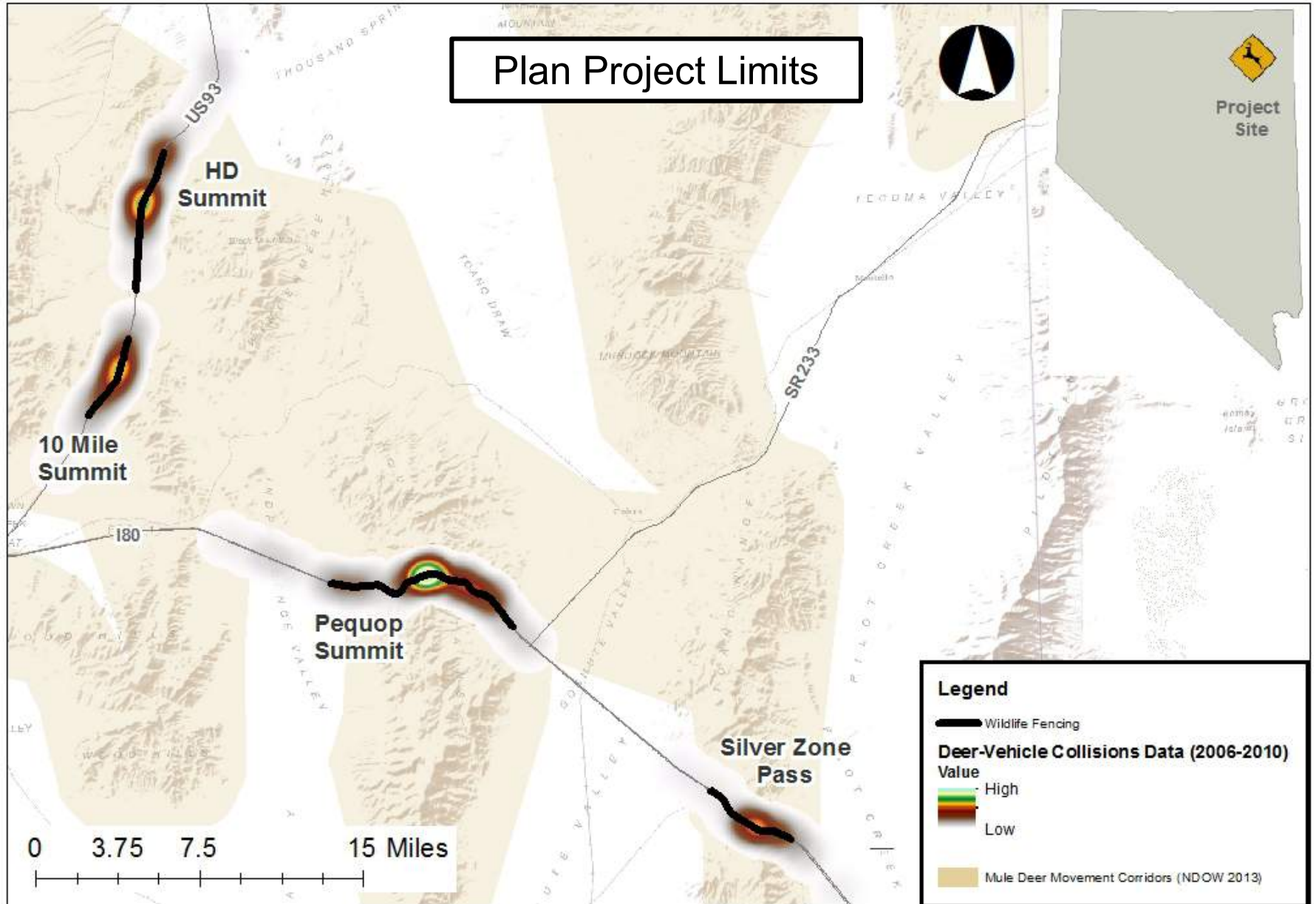
Wildlife and Safety Improvements along US 93 and I-80; A Landscape Scale Approach to Habitat Connectivity and Traffic Safety in Elko County, Nevada.

Available Crash
& Carcass Data
+ Movement Data



Wildlife and Safety Improvements along US 93 and I-80; A Landscape Scale Approach to Habitat Connectivity and Traffic Safety in Elko County, Nevada.

Plan Project Limits

















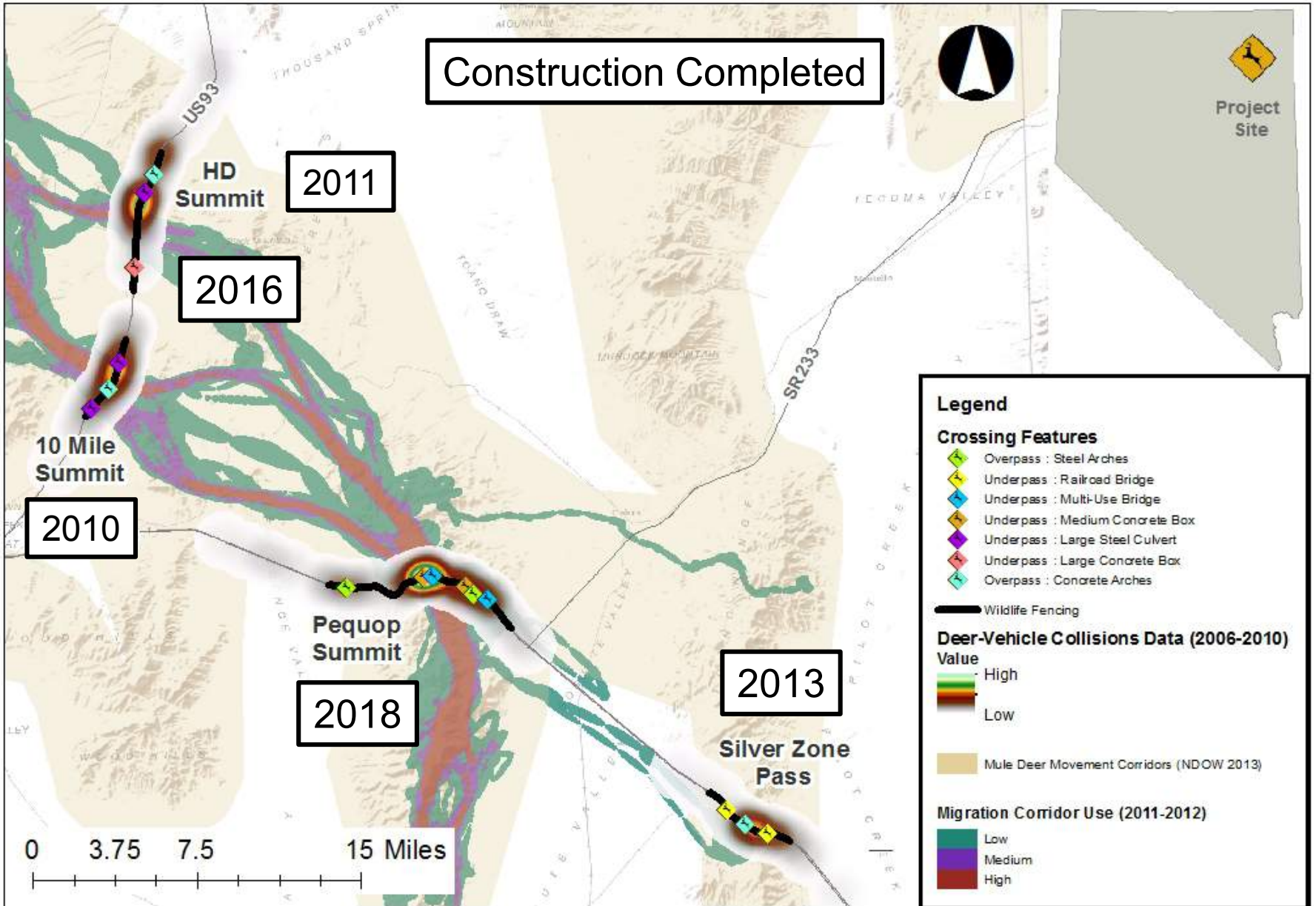


Wildlife and Safety Improvements along US 93 and I-80; A Landscape Scale Approach to Habitat Connectivity and Traffic Safety in Elko County, Nevada.

Construction Completed



Project Site

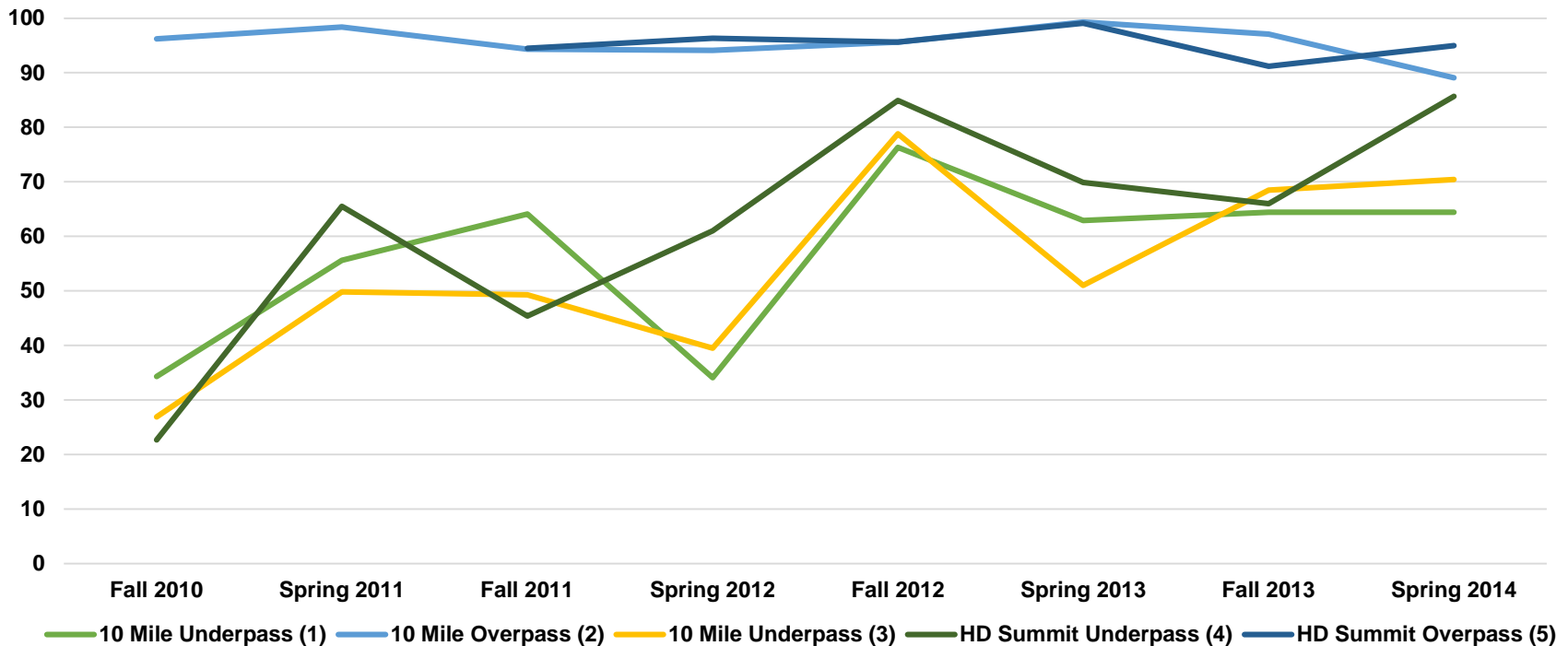


Agency Collaboration

- Data Collection & Analysis
- Project Design & Construction
- Research
- Hunting Laws



Percentage of Approaches that Were Successful Crossings



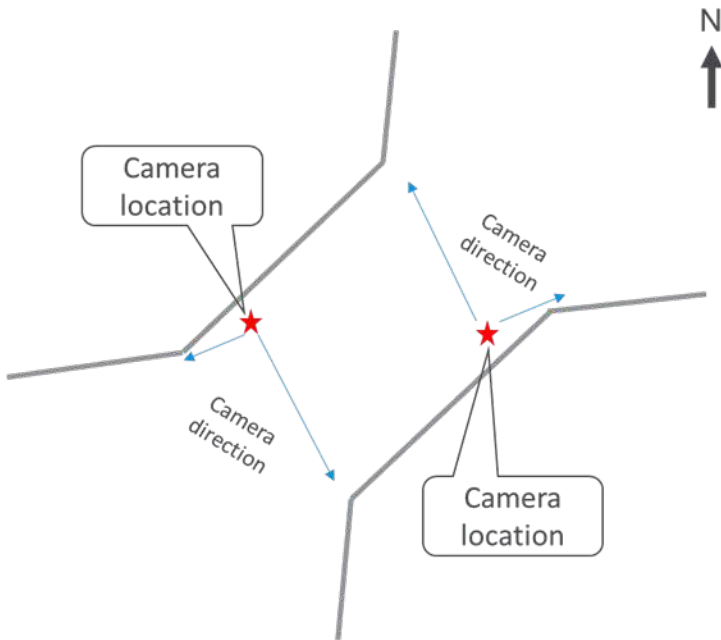
NDOT & UNR Research

Dayton Horse Crossing on US 50



NDOT & UNR Research

USA Parkway



Virginia Range Horse Mitigation Fencing and Underpasses



NDOT Research

Pooled Funded Study

- **Alaska DOT**
- **ARC Solutions**
- **Arizona DOT**
- **California DOT**
- **Iowa DOT**
- **Minnesota DOT**
- **Nevada DOT**
- **New Mexico DOT**
- **Ontario Ministry of Transportation**
- **Oregon DOT**
- **Parks Canada**
- **Washington DOT**

The Wildlife Vehicle Collision (WVC) Reduction and Habitat Connectivity
(Transportation Pooled-Fund Project TPF-5(358))



Nevada is Moving Forward

Mule Deer Migration Route

- US 93 (2010 & 2011)
 - 2 Overpasses
 - 3 Underpasses
 - 1 Underpass (2015)
- I-80 @ Silver Zone (2013-2014)
 - 1 Overpass
- I-80 @ @ Pequop Summit (2017)
 - 2 Overpasses
 - 2 Multi-Use Underpasses

Bighorn Sheep

- Boulder City Bypass (2018)
 - 1 Overpass
 - 4 Underpasses
- SR 160 (2019)
 - 1 Underpass

Wild & Feral Horses

- Dayton (2013)
 - 1 Underpass
- USA Parkway (2017)
 - 2 Underpasses



Jackie Gorton



Education



- Publications
- Professional Meetings
- Community Meetings
- University Research
- Neighboring States
- National Webinars
- Boy Scouts of America
- K-12 Presentations



Hunter Lake Elementary



U.S. Department
of Transportation

**Federal Highway
Administration**

Education in the Classroom

Donna Wood w/ Hunter Lake

*Thank you students of Hunter Lake Elementary
for "bridging the gap" with*

Create
Remarkable
Interesting
Techniques
Teach
Ecosystem
Responsibility



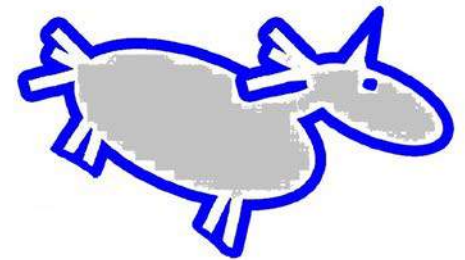
Connections
Roads
Outdoors
Structures
Safety
Influence
Nature
Globally
Science



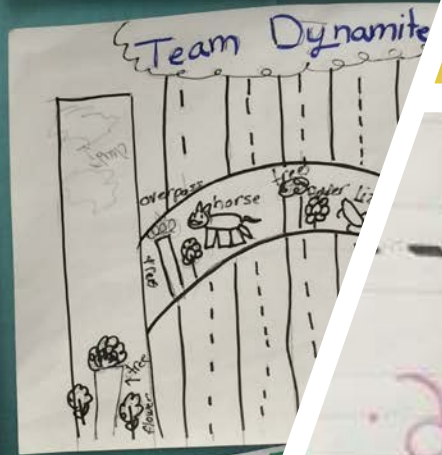
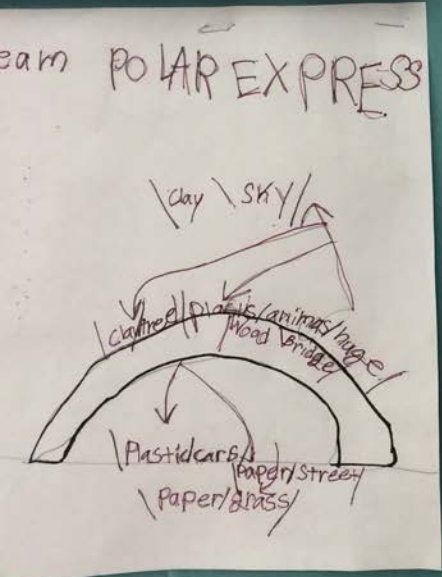
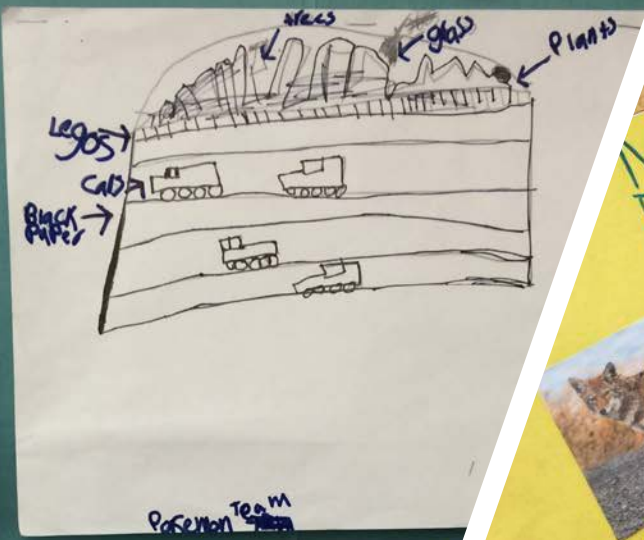
PBL
**Project
Based
Learning**



STEM
**Science
Technology
Engineering &
Mathematics**



reach ice
grass
flow
this one
over



popsicle Boulders
Sticks for support

Nevada Critter Crossing Animals

Mule Deer.

Bighorn Sheep.

Coyote.

Tortoise.

Brown Bear.

Animal Crossings

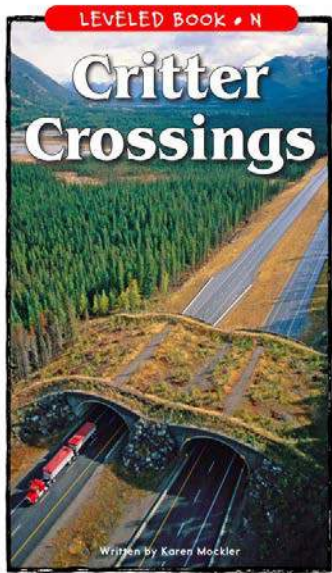
- 2.4 million collisions
- Every 26 seconds! ^{deer} vehicle collide
- 2,000 car-animal collisions





In The Classroom

Market to National Audiences



www.readinga-z.com



Reading A-Z

Visit www.readinga-z.com
for thousands of books and materials.

Conferences

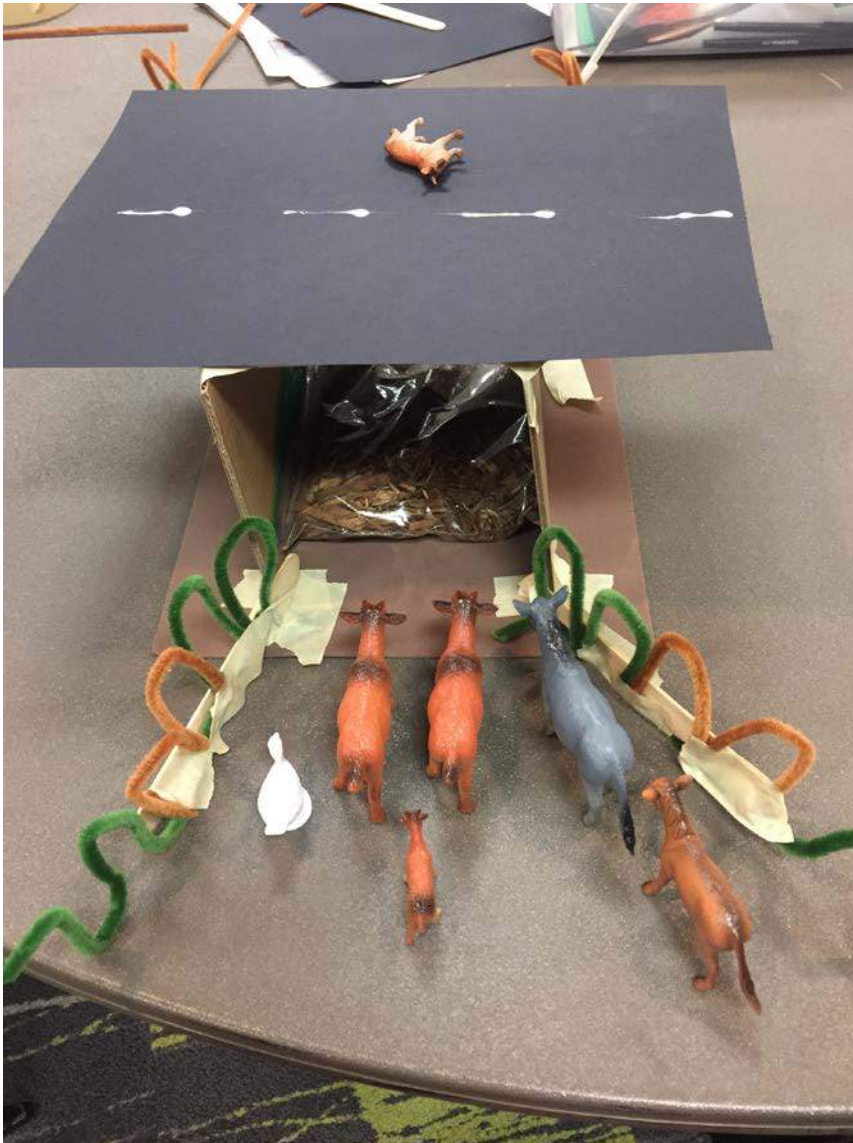
The Wildlife Society's Annual Conference, Cleveland, Ohio, October 2018.

The Transportation Research Board Annual Meeting, Washington, D.C., January 2019.

Big Game and Highways Workshop, Salt Lake City, UT, January 2019.



Market to National Audiences



Workshops

**National Science Teachers Association,
Reno, Nevada, October 2018.**

**National Science Teachers Association,
National Harbor, MD, November 2018**

**National Science Teachers Association,
Charlotte, NC, November/December
2018.**

Classroom Integration



Bordewich Bray Elementary School, Carson City, Nevada





Hopes?

**Improve Driver
Responsiveness**

**Increase Willingness
to Invest in Wildlife**

**Encourage
National
Development &
Deployment**

Lessons learned lead to opportunities for improvements!

Construction Pros and Cons

- Standard Bridge Design vs. Arches
- Concrete Arches vs. Steel Arches
- Ecological Timing

What Functioned and What Didn't Work?

- Fence Ends and Escape Ramps

Early Coordination Efforts with Partners

- Funding Opportunities
- Policy – No Hunting Law

Public Outreach Before and After

- Inform and Prove with Research

Crash and Carcass Data

- Collection Methods
- Doesn't Show Avoidance Behaviors



Lessons learned lead to opportunities for improvements!

Continued Research

Species Specific

- Use of Infrastructure
- Overpass vs. Underpass
- Multi-Use vs. Single Use
- Availability vs. Use
- Sizes and Ratios
- Cattle Guards
- Baiting

Active Warning Systems

- Lidar
- Radar
- Infrared Cameras



Lessons learned lead to opportunities for improvements!

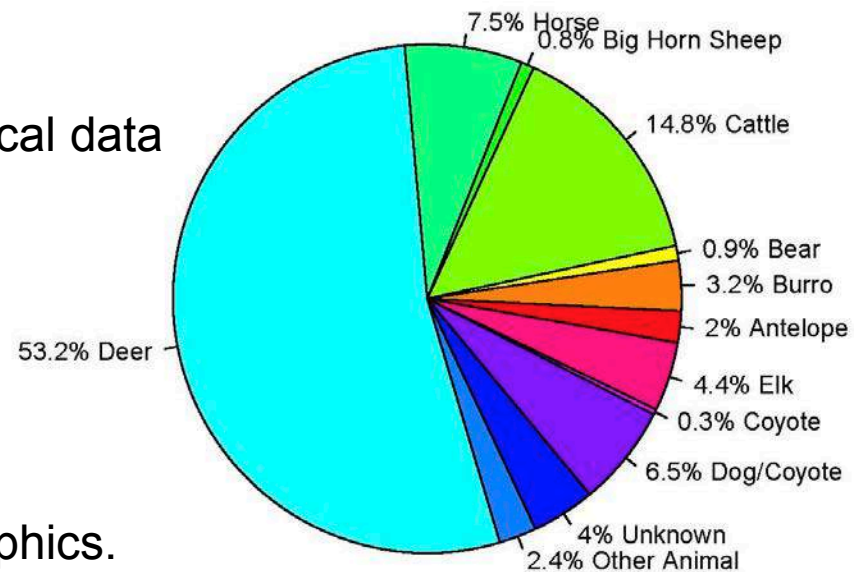
Statewide Assessments

Prioritization of Wildlife-Vehicle Conflict in Nevada

- Dr. Patty Cramer, PhD & Christopher McGinty, MS
- Utilized crash data and ecological data to prioritize the conflict areas.

US Davis Hotspot Tool

- Dr. Frasier Shilling, PhD
- Utilized crash data to highlight the conflict areas.
- Provided several summary graphics.



Nevada Data, n = 5,189

FUTURE GOALS

NDOT Action Items

Update Statewide Analysis every 5 Years

Integrate Conflict Areas into NDOT Planning

- State Transportation Improvement Plan (STIP)
- County and City Coordination Efforts

Continue Research to Reduce Animal-Vehicle Conflicts

- International Pool Fund Study
- New and Emerging Technologies

Continue Education Outreach

- Critter Crossings in the Classroom

Small Scale Goals

Conservation Easements

Education

Research

Create New Opportunities

Citizen Science

Early Coordination

Reach Out to Experts

FUTURE GOALS

Personal Wish List

Continue to Build Meaningful Partnerships

Wildlife Mitigation Consideration with New Developments

Formal Budget for Wildlife Mitigation



Thank you!



U.S. Department
of Transportation

**Federal Highway
Administration**



Nova Simpson, nsimpson@dot.nv.gov



Public Private Partnerships: Paving the Way to Implementation



Renee Callahan
Senior Policy Officer,
Center for Large Landscape Conservation
Executive Director, ARC Solutions

CENTER
for
**LARGE LANDSCAPE
CONSERVATION**

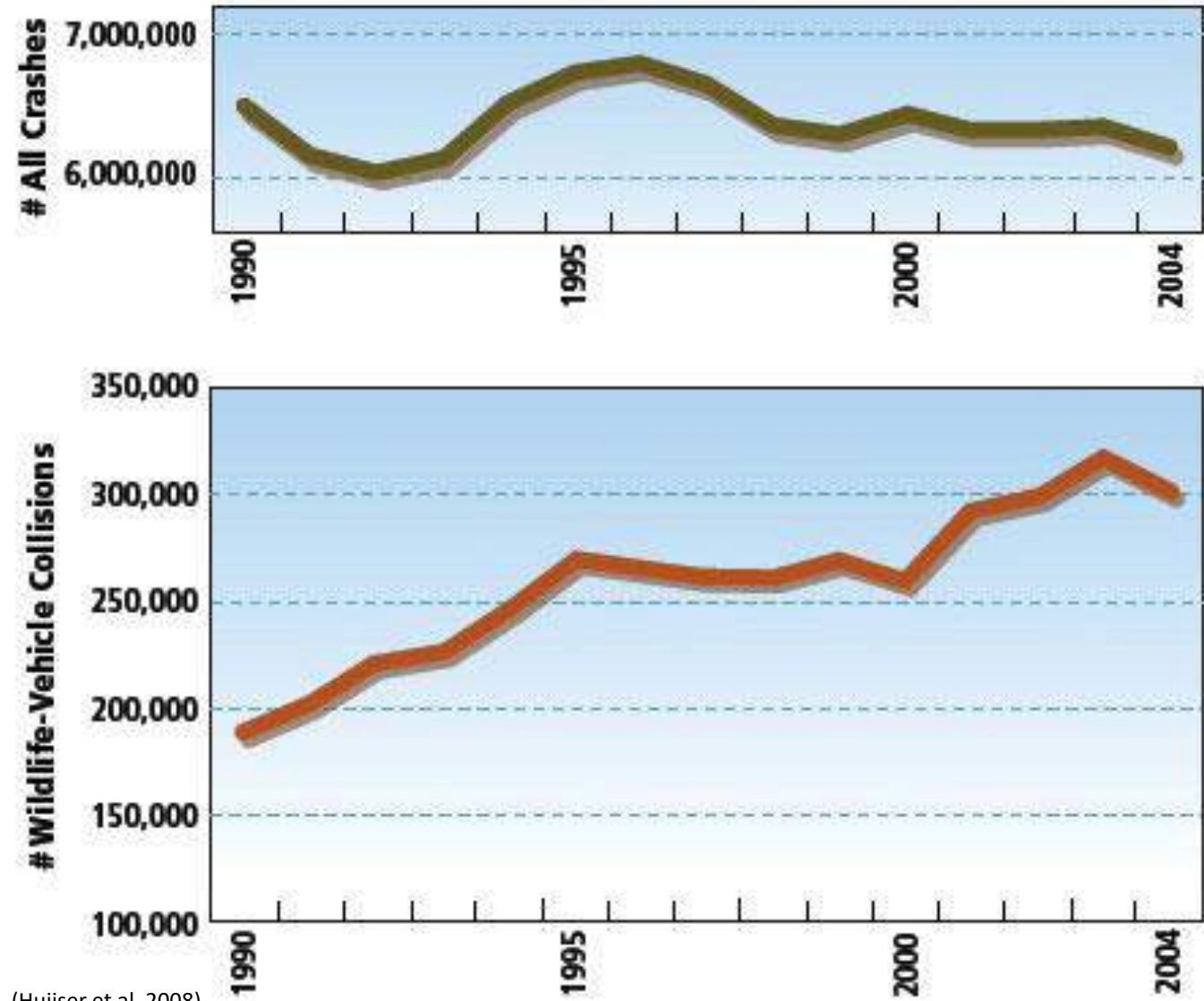


Goals for Today

1. Background
2. What is a PPP?
3. Case studies
4. Ingredients for success



Total U.S. Crashes Versus Crashes Involving Animals, 1990–2004



(Huiser et al. 2008)



Credit: Shane Macomber, *Vail Daily*



Credit: Rob Ament



Credit: Parks Canada

If we build them, will they come?



BOURG

RECONYX

ROADWAYS & WILDLIFE

THE PROBLEM

- Roadways fragment habitat, restricting wildlife's access to food, water, shelter and mates.
- Wildlife crossing attempts increase wildlife-vehicle collisions.
- Wildlife-vehicle collisions are costly and too often fatal.
- Restricted movements can decrease genetic diversity and wildlife's ability to adapt to a changing climate.

A SOLUTION

Highways are safer when wildlife are separated by crossing structures, such as overpasses, underpasses **and** fencing.

EFFECTIVE? Absolutely!

Data collected from studies of crossing structures with wildlife fencing throughout North America indicate up to an **86-97% DECREASE** in wildlife-vehicle collisions upon affected roadways.



% Reduction in Collisions

Average Cost of a Collision by Species
(In 2016 US Dollars)



HOW TO HELP

- Investigate highway projects in your state and their potential to make roads safer for wildlife and people.
- Recommend science-based mitigation measures to your State Department of Transportation.
- Consider joining a local conservation group working to reduce the barrier effect of roads on habitat connectivity.
- Get involved with county or local-level initiatives that create safe passage for wildlife and motorists.

WORTH THE COST? Yes!

The costs of collisions to society often outweigh the costs of building wildlife crossing structures. Placing structures along road segments with as few as 5.1 deer collisions per mile per year creates net public benefits.

Every Year in the United States
1-2 Million Wildlife-Vehicle Collisions Cause...

- > 200 human fatalities
- > 26,000 injuries
- ~ \$9.7 Billion in costs

ARC

Produced by Alyson Morris, Rob Ament and Renee Callahan

For More Information Please Visit: arc-solutions.org

Car Accident - Mourad Mokrane, RU | Deer - Graham John Pegg, CA | Bridge - Alex Fuller, US | Bear - Sergey Demulstkin, RU | Moose - Yichen, CA | Sheep - Norman Ying, US | Car - Effor | Fence - Adam Stripton, US

THE CENTER FOR
LARGE LANDSCAPE
CONSERVATION

#1 barrier to crossing structures?



ARC
SPECIAL PUBLICATION
INNOVATIVE STRATEGIES TO REDUCE THE COST
OF EFFECTIVE WILDLIFE OVERPASSES

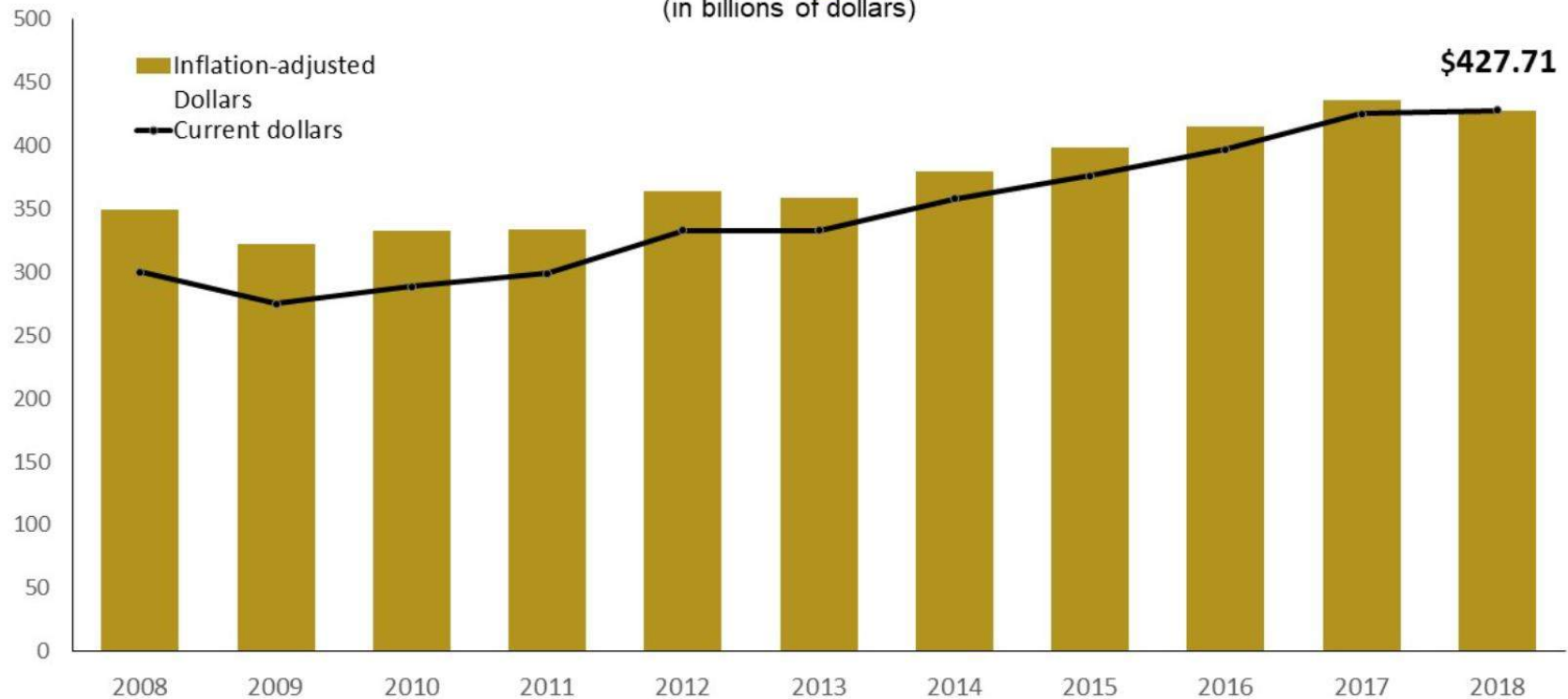
ARC
SPECIAL PUBLICATION
HIGHWAY CROSSING STRUCTURES FOR WILDLIFE:
Benefits of a National Commitment to
Increase Driver and Animal Safety



The power of public-private partnerships

Total US Giving: 2008-2018

(in billions of dollars)



SOURCE: Giving USA Foundation | *GIVING USA 2019*

WYOMING:

Teton County Highways



Jackson Hole Camera Traps





HOBACK E



HC600 HYPERFIRE

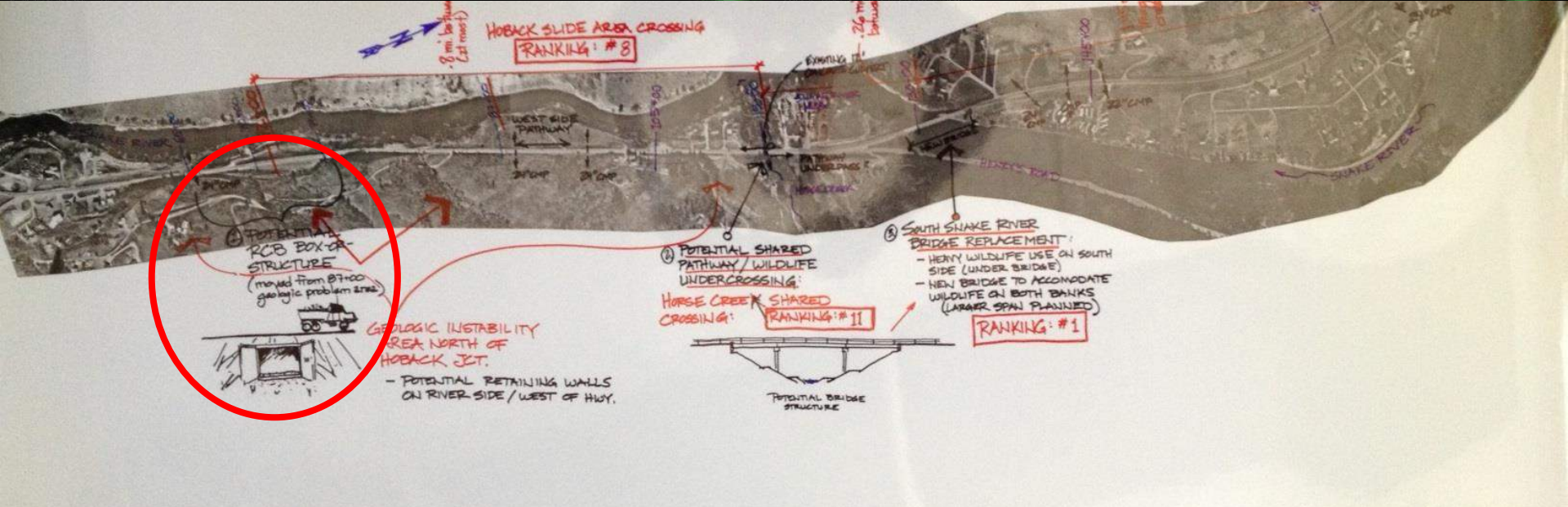


Photo Credit: CLLC, GYC, JHCA, JHWF, Y2Y
Panel Credit: Darin Martens, USFS/WYDOT

JACKSON SOUTH HIGHWAY PROJECT

PANEL #1 - SOUTH END

Jackson/Teton County Integrated Transportation Plan Dashboard

Report Year

2013



Data/Prioritization: County-wide Wildlife Crossing Master Plan



RECOMMENDED WILDLIFE CROSSING PRIORITY RANKINGS

Site number on map		Land Security	Political Viability	Key Partner Support	Technical Feasibility	Long Term Solution	Master Plan Score*	Avg. Rank
1	Hwy 22/390 Intersection / Snake River Bridge	3	3	3	2	2	9	22
2	Hwy 22 Spring Creek to Bar Y	3	2	2	3	2	9	21
3	Camp Creek (at-grade)	3	2	2	3	1	9	20
3	Camp Creek (long-term)	3	2	2	1	3	9	20
4	North of Jackson to Fish Hatchery	3	3	1	2	3	6	18
5	South of Jackson to Rafter J	3	1	1	2	1	9	17
6	Horse Creek to Hoback Junction	3	3	3	1	3	3	16
7	Broadway (long-term)	1	3	1	1	1	9	16
8	Teton Pass West Side	3	3	2	2	3	3	16
9	Game Creek	2	1	1	1	2	9	16
10	Dog Creek (at-grade)	2	2	2	2	1	6	15
11	Blackrock/Togwotee	3	1	1	1	2	3	11
12	WY 390	1	1	1	1	2	3	9

Funding:
*\$10 million Special
Purpose Excise Tax*

Vote For
WILDLIFE CROSSINGS ON SPET
NOW THROUGH NOV 5



Photo: Josh Metten

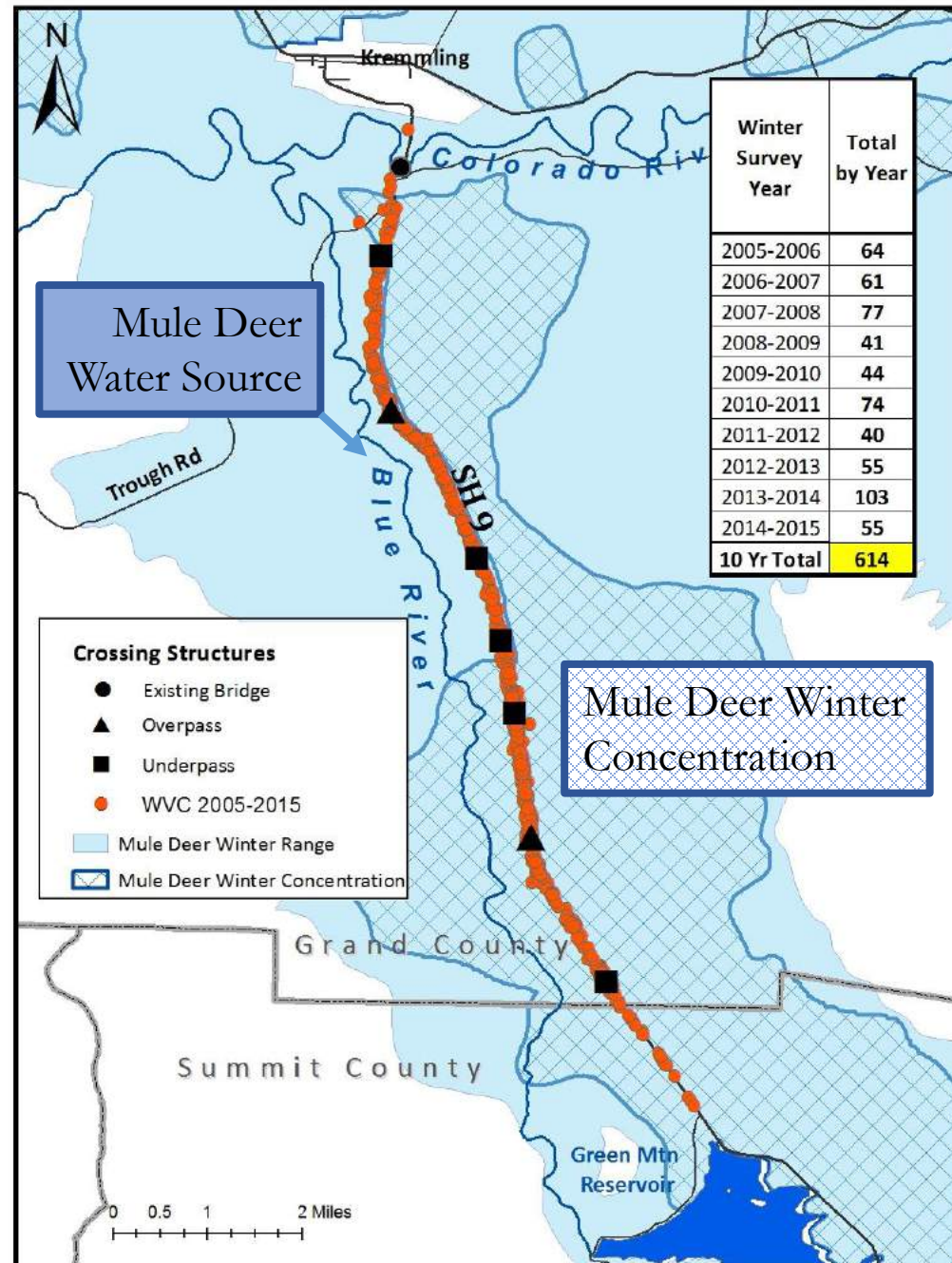
COLORADO:
Highway 9 South of Kremmling



Blue Valley Ranch-September 9, 2016

Highway 9 (con't)

- 2001 – BVR approaches CDOT
- No funding available
- 2005 – BVR begins to collect carcass data
 - CDOT's WVC data is only a subset, ~60% of BVR's data
- 2005-2015 – BVR records 600+ carcasses in 10.5 miles
 - 97% are mule deer



\$9.2 million in 45 days

THE CITIZENS FOR A SAFE HWY 9 WOULD LIKE TO THANK OUR GENEROUS SUPPORTERS FOR MAKING THIS DREAM A REALITY

Francis Abate
Clair & Lynn Armstutz
Robert Anderson
Antlers & Art LLC
APEX Consulting Services
Rebecca Arnold
Larry Banman
Jeff Barber
Carvy Barnes
Henry Barr
Jim Benson
Patricia Berman
Blue Valley Ranch
Blue Valley Sportsman Club
Jim & Sonya BonArno
Thomas & Linda Brannan
Kevin Brooks
Bull Basin
Gary & Jennifer Burgarner
Alan & Briars Callahan
Tim Casey
Center for Large Landscape
Conservation
Jim Cervenka
CGA LLC
City of Steamboat Springs
Colorado Department of Transportation
Colorado Open Lands
Colorado Parks & Wildlife
Michelle & John Cowardin
Jennifer & John Damese
Brett & Kim Davidson
Byrdie Cummings & Brett Derby
Devil's Thumb Ranch
Barry DiDinato
Anna Dreker-Dress
Stanley Druckenmiller
Glenn Durbin
Bill Dufors
Kelley Duke
Archie Durham
ECO-resolutions, LLC
Eight Mile Cattle, LLC
Elk Fork Ranch
Geoff Elliott
East Grand School District
Everist Materials
Bridgett Ferguson
Rob Firth
George M. Ferha
Frederick Fox
Friends of the Lower Blue River
Linda Gerrans
Dexter Glicksons
Bob Gurin
GO Alpine
Jennifer Gold
Harvey Gilsons
Grand County
Grand Foundation
Jerry & Joanne Green
John Guinn
Katie Hammer
Patty & Susan Handypide
Amanda Harty
Julie Haugh
Headwaters Trails Alliance

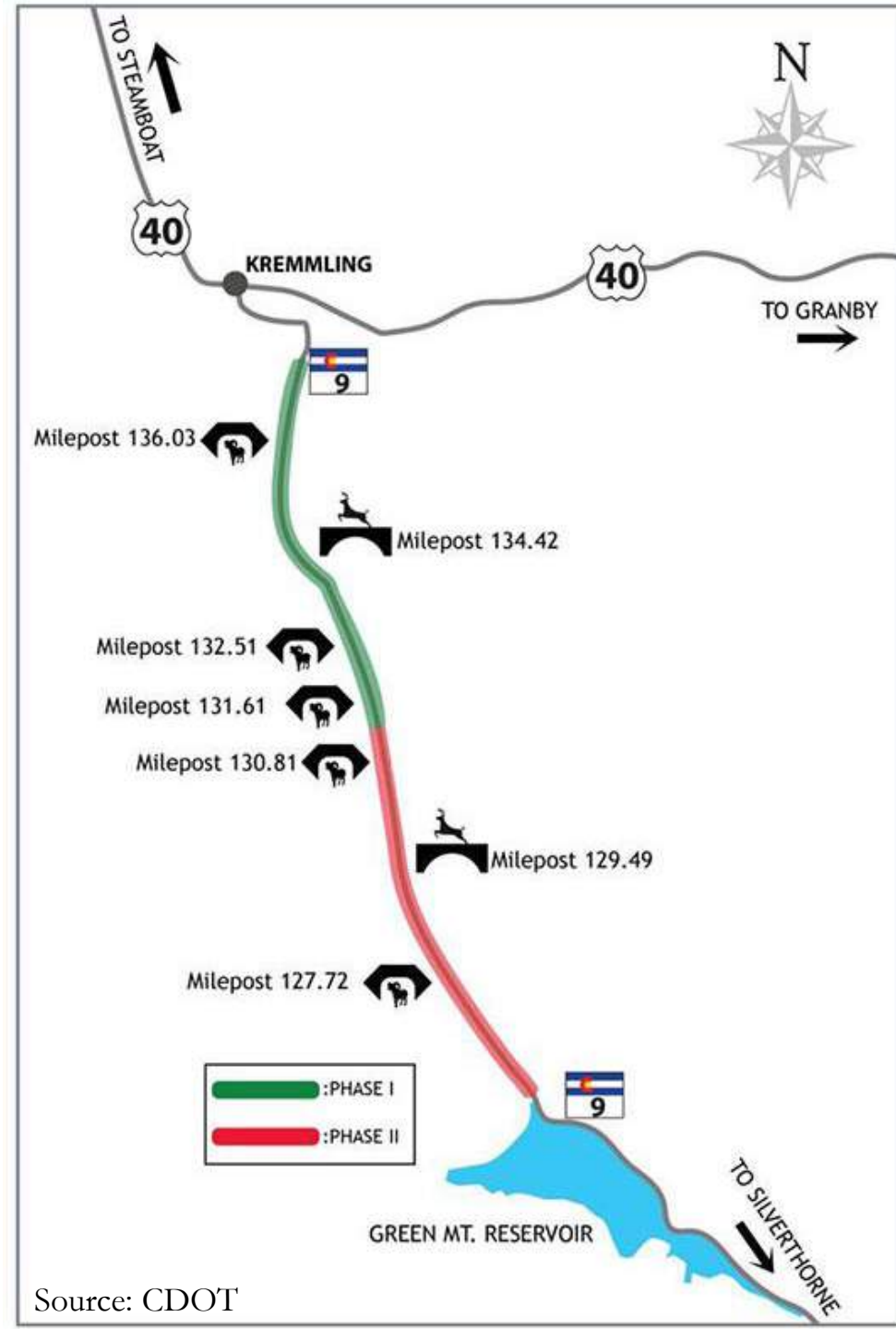
Barbara & Jonathan Heuberger
Vicki Hinchcliffe
Tanner Hollingsworth
Todd Holtworth
Joan Hanley Houston
Lawrence & Malinda Howes
Diane Huffino
Mickie & Wes Hunter
Island Stapleton Pryor & Pascoe, PC
Angela, Tony & Jessica Johnson
Dave & Leslie Jones
Russell & Ana Kemp
William & Carolyn Kemp
Lisa Hendall
James J. Killean
Kirkland Construction
John Klembersz
Kiermeling Fire District
RF Kuharich
Lampson Crane
Lon LeBaron
Jeff & Sheri Leigh
Richard Lesser
Jeff & Shannon Lukiers
Larry & Kathy Lunceford
Tim Lytle
Mad Adventures
Christine Mahorney
Al & Kris Manguso
Brody & Shelly Meelis
Mark & Marilyn McCaulley
Middle Park Habitat Partnership Committee
Middle Park Medical Center
Michelle Mierzykowski
Brenda Miller
Rich & Carolyn Miller
Mike Mitchell
Dale & Debra Mitchiner
Hank Moreno
Mountain Parks Electric
Oliver Mowers
Nuley Fanatic Foundation
Bernie & Chris Murphy
Mark Murphy
Susan & Peter Neadocker
Nells Lunkeford
Carol Northcut
Northwest Graphics
Northwest Rawhide Supply
Michael Norman
Jean G. Norman
Susan & James O'Brien
Heather O'Connell
Paul & James O'Connell
Elizabeth Rad & Herb O'Keefe
Chad Parker
Garry Patrick
Sheri Paul
Mark Paulson
Chris Paulson
Gloria Permyra
Pete & Carol Petersen
Jeff Peston
Arlene Poo
Elizabeth Poole
PATRICIA Rada-Sidinger
Carl Richard

Stuart & Marty Richardson
Josh Richert
Steve & Jeanne Richheimer
Ridgeway Family
Ritschard Cattle Co. LLC
Bill Rittek Jr.
Mike & Mary Jo Roal
Rockford Gray, LLC
Richard & Sara Rosene
Ross Residential Construction
Bill Ross
Bob & Judy Rujhela
Saddle T Services
Steve & Martha Schake
Darwin & Barbara Scholl
Jennifer Schubert-Akin
Reats Scott
Morris Scott
Select Super Market
Kären Shackles
Nancy Shawver
Jim & Judy Sherwin
Lyle & Amy Sidener
Michael Sidinger
David & Rhea Gallagher-Skinner
Scott Spade
Linda & Robert Spaet
Clarence Sparks
Spotted Eagle
Rose Stahl
George Stark
Steamboat Hot Shog
Caitlin & Cody Stouben
Gary & Sherry Stouben
Madelyne & George Stevens
David & Miriam Stout
Doreen Sumertin
Summit County Government
William Tano
Granby Vet. Clinic
Garnison Taussig
David Taussig
Lucas Taylor
Jeff Terrell
Scott Terryberry
The Whitmer Law Firm
Town & Country Insurance
Town of Silverthorne
Bruce Trigg
Trinchera Blanca Foundation
Trout Unlimited
Judy Urban
USDA (Dept. of Agriculture)
Pat Vance
Gig & Johnny Walker
Liz Webb
Teresa Weinman
Lisa Werts
Western Land Group
Katherine Whelan
P. Roxane White
Christina Whitmer
Noel Wilson
Steve & Gaye Wormington
Yunt Ranch

Success!

- Colorado's 1st (two) wildlife overpasses!
- 5 large underpasses
- 10 miles of fencing
- 61 escape ramps
- Plus pedestrian gates & cattle/access guards
- Moose, pronghorn, elk, white tail & mule deer, black bear, red fox, bobcat, coyote, badger, big horn sheep, jackrabbit

Bottom line: 90% reduction in WVCs in the first year...



But wait there's more!

- Led to stronger working relationships...which led to
- June 2017 Wildlife & Transportation Summit
 - Outcomes & Recommended Action Items
 - Develop a Wildlife and Transportation Steering Committee(s)
 - Establish Partnerships and Develop Outreach Strategy
 - Consolidate and Integrate Data and Technology
 - Determine and Identify Consistent Funding
 - Advance Public Education of Wildlife and Transportation Issues

Providing Safe Passage for People and Wildlife in Colorado



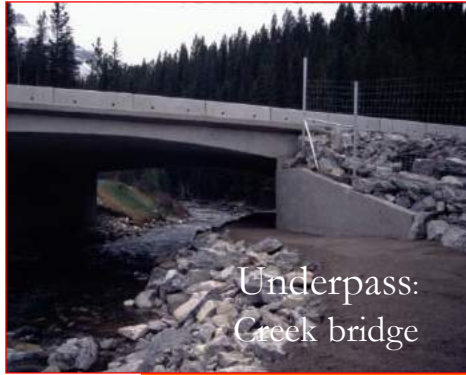
Photo Credit: CDOT

COLORADO:

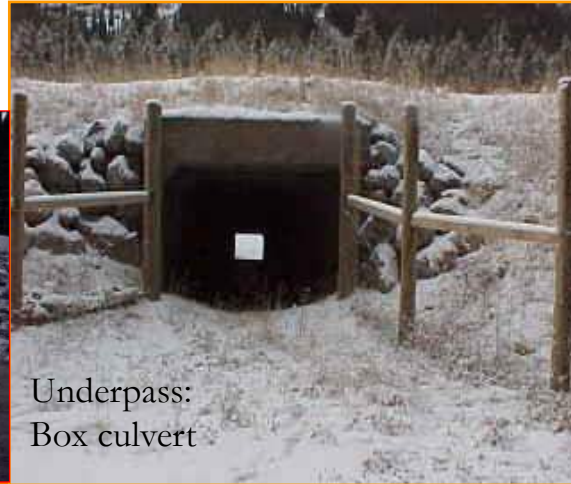
I-70, site of *ARC Design Competition*



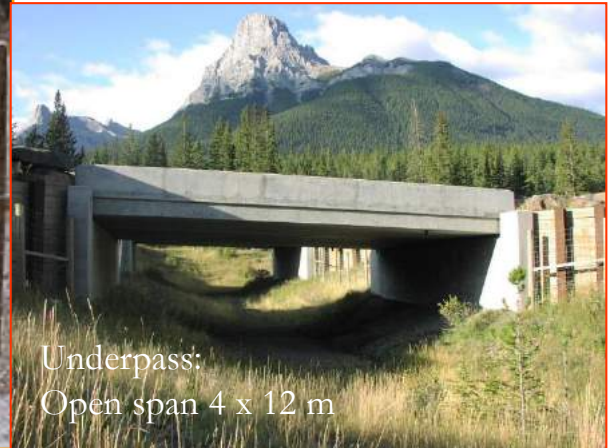
Genesis of ARC



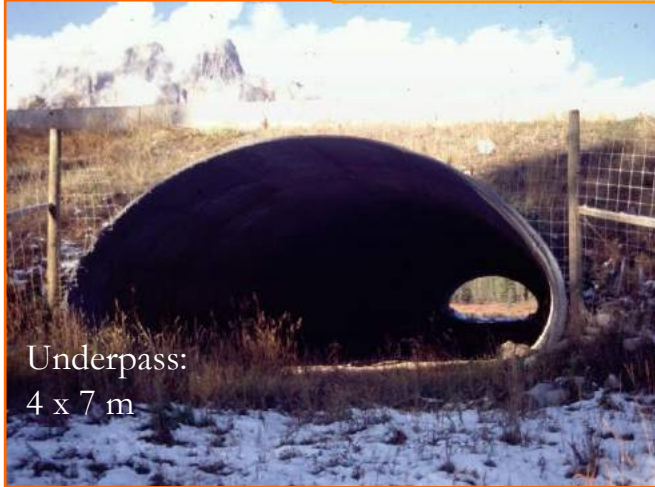
Underpass:
Creek bridge



Underpass:
Box culvert



Underpass:
Open span 4 x 12 m



Underpass:
4 x 7 m

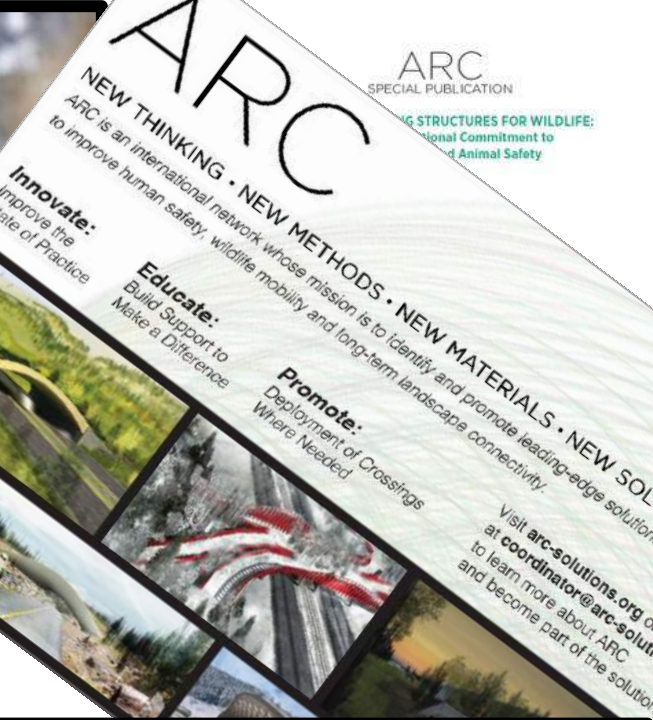


Overpass:
50 m wide

ARC Competition – and the winner is



HNTB with Michael Van
Valkenburgh Associates



The American Society of Landscape Architects

presents the

Honor Award in Communications

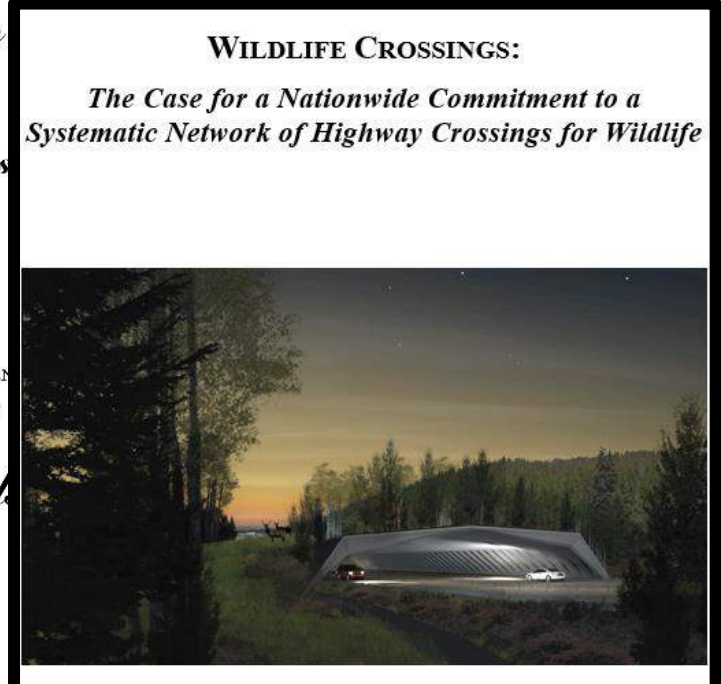
to

ARC SOLUTIONS

for

CHAMPIONING CONNECTIVITY:
HOW AN INTERNATIONAL COMPETITION CAPTURED GLOBAL ATTENTION
INSPIRED INNOVATION IN WILDLIFE CROSSING DESIGN

2017 Professional Award



ARIZONA:

Pima County State Route 77

- Citizens of Pima County approved a 0.5 percent sales tax for 20 years.
- A portion of the tax revenue is set aside to protect and enhance wildlife connectivity across the county's road system.



ARIZONA/UTAH:

Highway 89 near Kanab

Arizona Game and Fish Department and Sportsmen	\$130,000
Utah Department of Wildlife Resources and Sportsmen	\$100,000
Grand Staircase Escalante National Monument (FHWA grant)	\$1,525,000
Grand Staircase Escalante National Monument (Staff Support)	\$10,000
Utah Department of Transportation	\$625,000
Kane County (estimated)	\$125,000
Mule Deer Fdn-Sportsmen for Wildlife: Signs & Fence Maintenance	<u>\$2,000</u>
Partnership Total	\$2,517,000



Credit: P. Cramer, USU, UDWR and UDOT

MONTANA:

Highway 206 in the Flathead Valley

Whitney Ranch Donation: 80 acres conservation easement
Local funding drive for \$165,000 mitigation project:

Whitneys
Flathead County Commissioners
American Wildlands
Yellowstone to Yukon Conservation Initiative
Wildlife Land Trust
Northern Rockies Conservation Cooperative
Friends of the Wild Swan
Swan View Coalition
Montana Backcountry Hunters and Anglers
16 individuals and ranches
Montana Department of Fish, Wildlife and Parks
MDT Community Transportation Enhancement Grant

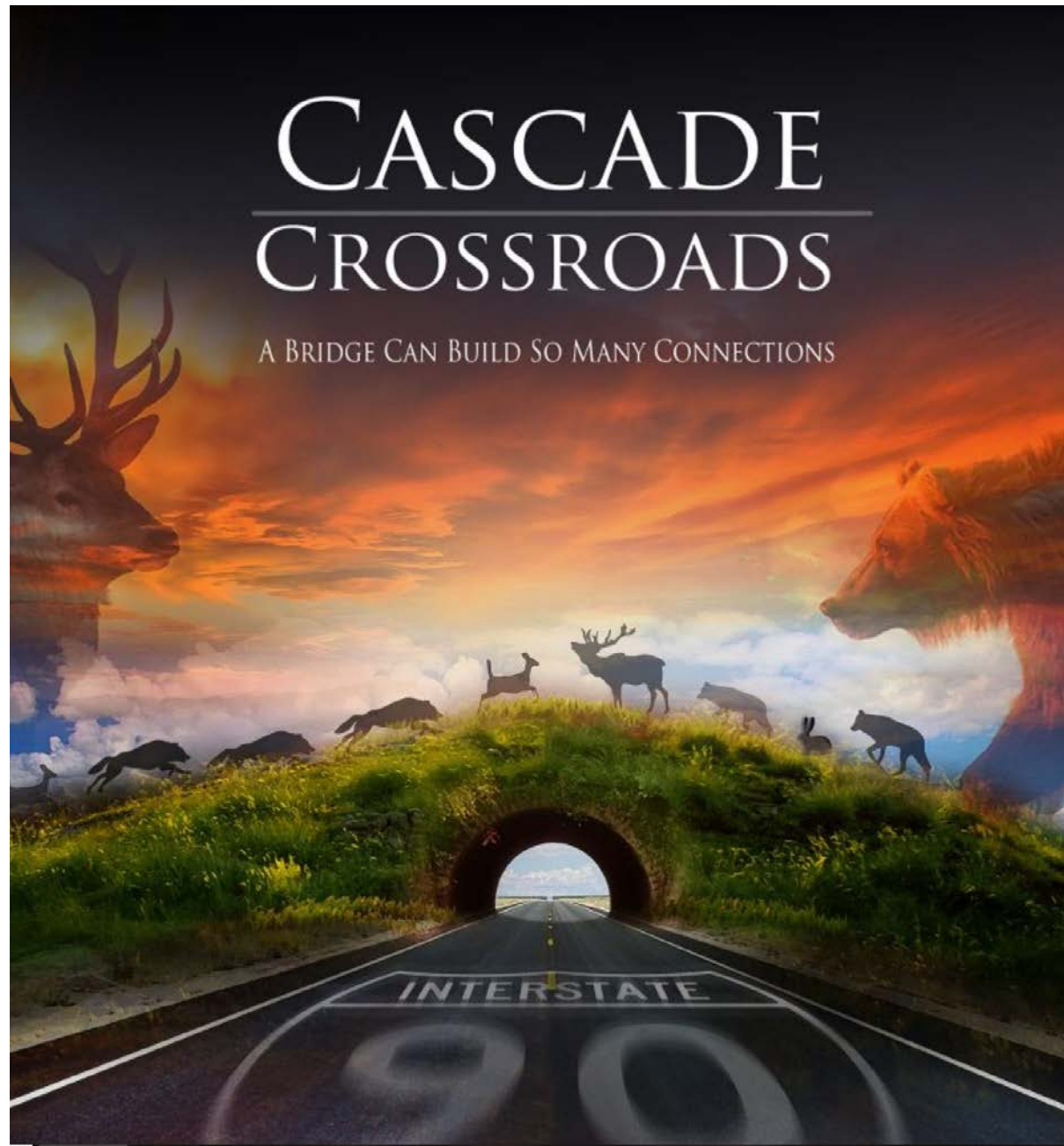


WASHINGTON: *I-90 near Snoqualmie Pass*



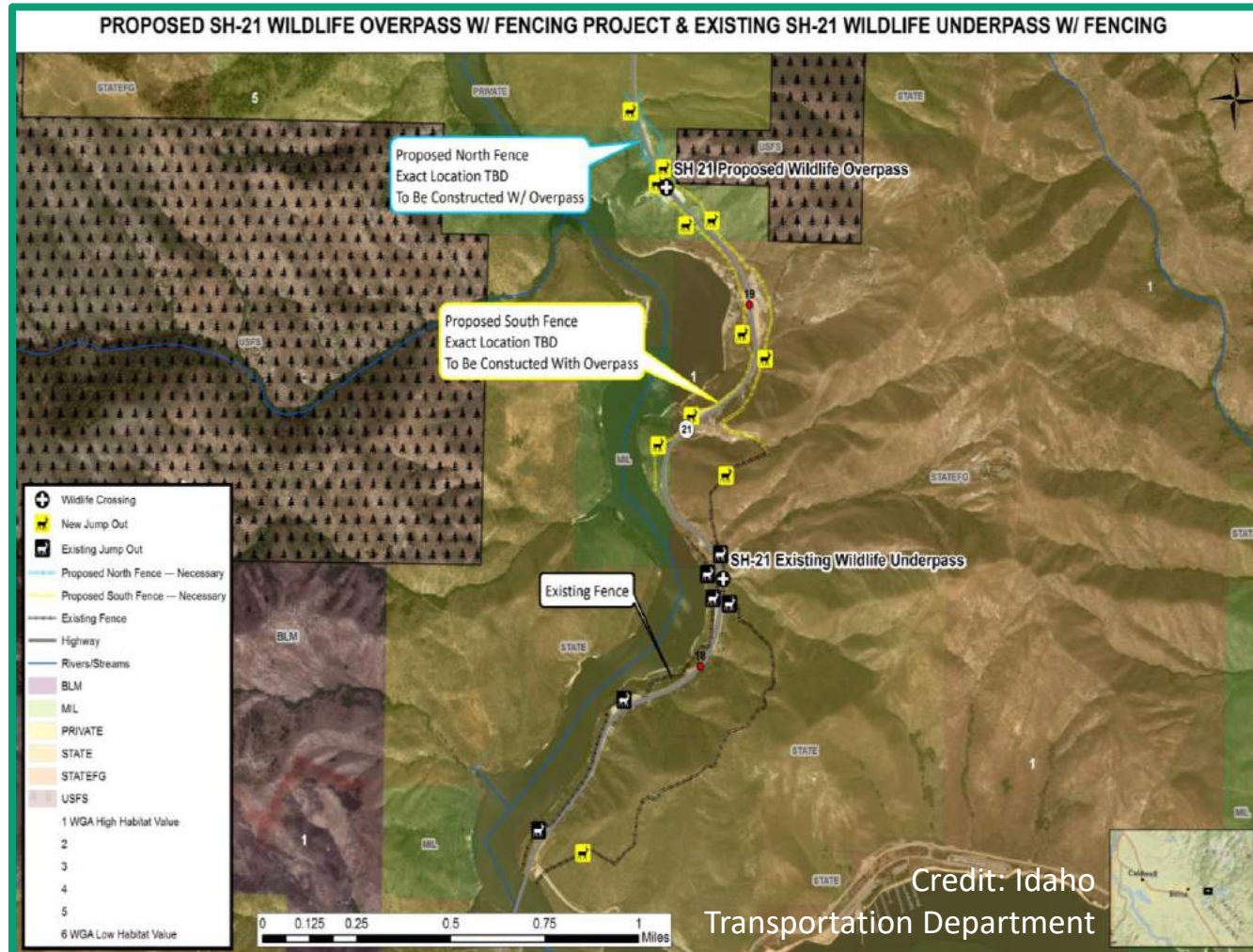
Photo credit:
Washington DOT

WASHINGTON:
*I-90 near
Snoqualmie Pass*



IDAHO:

State Highway 21 near Boise Wildlife Management Area





Credit: Idaho Transportation Department

MONTANA:

Highway 93 on the Flathead Reservation



CALIFORNIA:

Highway 89 Stewardship Team



Partners include:

- Sierra County Fish and Wildlife Commission
- Sierra County
- USDA Forest Service: Tahoe National Forest & Pacific Southwest Research Station
- California Department of Fish and Game
- California Department of Transportation
- University of California Cooperative Extension
- UC Berkeley-Sagehen Creek Field Station
- California Deer Association
- University of California, Davis

CALIFORNIA: *Liberty Canyon Wildlife Crossing*



SANTA MONICA
MOUNTAINS

Credit: National Wildlife Federation
and Liberty Canyon project partners

P22 is trapped by two freeways and will likely never find a mate.
Help build the Liberty Canyon Wildlife Crossing so other LA cougars can find love.



Can you spare \$10 for LA's Loneliest Bachelor?

TEXT "LION" to 25383

#SAVECACOUGARS



© 2014 National Wildlife Federation. All rights reserved. For more information, visit www.nwf.org. Photo credit: National Wildlife Federation.

UTAH:

Parley's Summit near Park City

PARK CITY'S WILDLIFE IS UNDER ATTACK



Credit: Save People Save Wildlife

IN 2014 ALONE, **144 ANIMALS** WERE KILLED BY AUTOMOBILE COLLISIONS ALONG THE I-80 CORRIDOR FROM SLC TO WANSHIP **INCLUDING ELK, DEER AND MOOSE**

NEVADA

Highway Safety Structures



Credit: Nevada DOT



Winning for Wildlife



A Unit Plan for grades 5-10
 Sponsored by ARC Solutions & Western Transportation Institute
 at Montana State University, Bozeman



Wildlife-Vehicle Collision Reduction and Habitat Connectivity Pooled Fund Study Now Open!



This pooled fund study will build upon the collaborative efforts of public and private partners, including the Federal Highway Administration, NV Dept of Transportation, ARC (Animal Road Crossings) Solutions, and the Western Transportation Institute at Montana State University.

Participating study members will have an opportunity to develop, review and select national and regional research projects that:

- Explore the effectiveness of new mitigation measures.
- Evaluate improvements to existing mitigation measures.
- Assess mitigation for particular species of conservation interest.

Images courtesy of:
Nevada Department of Transportation
Tim Torell w/ Tim Torell Photography.
www.digitalwildlifeimages.com

POOLED FUND STUDY www.pooledfund.org/Details/Study/610



THE PEW CHARITABLE TRUSTS

Structure and Process for Wildlife Transportation Planning

Matt Skroch

**Wildlife Considerations in Transportation and Community
Planning**

October 15, 2019



NDMP 2015

2015

The Take-aways, first

- Nevada already has world-class projects under its belt, where do you go from here?
- Don't reinvent the wheel – great templates and ideas from nearby states.
- Institutionalize your effort.
- Create process and structure inclusive of stakeholders outside of government.
- Leverage partnerships to build support, collect data, and raise money.

Value Proposition

- Conserving wildlife
 - Successful, migrating herds of many ungulates are healthier, more resilient than non-migrating herds.
- Saving taxpayers money
 - Projects in collision hotspots “pay” for themselves many times over.
- Improving driver safety
 - We consistently see 80-90% decrease in wildlife-vehicle collisions in places where infrastructure is improved/retrofitted for wildlife passage,

A Hot Topic

- Western Governors' Association resolution 2019-08
- Wildlife and transportation legislation passed in Oregon and New Mexico
- 1 west-wide and 3 state – now 4 – wildlife and transportation summits (all “firsts”)
- Governor's executive order in Colorado
- Governors advisory group and forthcoming executive order in Wyoming
- Department of Interior Secretarial Order 3362
- \$250m for wildlife connectivity currently in bipartisan highway bill reauthorization passed out of Senate committee.

Montana Wildlife & Transportation Summit (Dec. 2018)

Purpose: Bring stakeholders together to strengthen working relationships, share information, and develop strategies to plan and implement wildlife accommodations; reduce animal-vehicle collisions; and protect wildlife and their movement across state highways.

Outcomes:

- Formation of Montana Wildlife and Transportation Steering Committee.
- Creation of a formal process for identifying shared priorities between MDT, FWP, NGOs and other stakeholders.
- Commitment to meet biennially to discuss highway projects in the Statewide Transportation Improvement Program. Expand the scope of the biennial meetings to include additional topics.

Montana Wildlife & Transportation Summit, Dec. 2018

Outcomes, continued...

- Create a collaborative structure of committees and/or work groups to provide the capacity to plan for and implement wildlife accommodations, as well as define roles and responsibilities.
- Develop a Memorandum of Agreement (MOA) between MDT and FWP that outlines how the agencies will work together on wildlife and transportation issues. This MOA can provide consistency through different agency administrations and build a foundation for a broader partnership, including NGOs and other stakeholders.
- Develop a website that outlines the collaborative structure and provides a clearinghouse for activities during and after the Summit.

Colorado Wildlife and Transportation Summit, June 2017

Purpose: Establish partnerships and share ideas and expertise around improving highway safety, and protecting wildlife populations and movement corridors. The Summit focused on informing and engaging agency staff, decision-makers, and public and private stakeholders on current issues around:

- wildlife concerns;
- highway safety;
- partnership opportunities and case studies related to wildlife populations;
- highway crossings/mitigation features; and
- animal-vehicle collisions.

Colorado Wildlife and Transportation Summit



Outcomes:

- Formation of Colorado Wildlife Transportation Alliance, a collaborative effort to improve human safety while integrating wildlife movements into Colorado's transportation system. Includes measures that institutionalize wildlife considerations into transportation projects, build partnerships and awareness to protect wildlife movements across the landscape, and reduce wildlife-vehicle collisions while maintaining wildlife populations.
- Establish common mission and staff assignments in CDOT/CPW to allow for close collaboration and work to share information and make incremental progress in communication.
- Revise previous MOU or create a new MOU to set expectations and hold Committee members accountable to action items and agreements



Wyoming Wildlife and Roadways Summit

April 2017



Purpose: To focus attention on migrating and wintering wildlife, wildlife-vehicle collisions, and motorist safety with the goals of:

1. Strengthen relationships, broaden participation, and enhance communication between WGFD, WYDOT, NGO partners and the public to work together to develop mechanisms to fund and implement priority projects to address the effects of roads on wildlife and minimize wildlife/vehicle collisions; and
2. Identify priority areas around the state and work together to find ways to fund and implement projects that reduce wildlife/vehicle collisions, increase motorist safety, and maintain or reestablish disconnected wildlife migration routes and other critical wildlife seasonal habitat (i.e. crucial winter ranges).



Wyoming Wildlife and Roadways Summit



Outcomes:

- Formation of the Wyoming Wildlife and Roadways Initiative and its Implementation Team
- Assessing a liaison position (Initiative Liaison) between WGFD and WYDOT.
- Each WYDOT District's and WGFD Region's personnel meet, at minimum, once a year to review the STIP, other highway related projects, and wildlife concerns and data. This may require a memorandum of understanding between the two agencies. The District Engineer and Wildlife Management Coordinator are responsible for coordinating these meetings for each region.



Wyoming Wildlife and Roadways Summit



Outcomes, continued...

- Convene a workshop among WYDOT District Engineers and WGFD Wildlife Management Coordinators to identify criteria and develop and implement a decision matrix to prioritize the larger projects/issues mapped statewide during the Summit.
- Release a prioritized list of infrastructure projects and work with stakeholders to identify funding sources.
- Develop a consolidated GIS database of the problem areas and mitigations identified.



State Legislatures

- New Mexico SB 228 (2019)
 - Calls for a state wildlife corridors action plan
 - Calls for a wildlife corridors project list
- Oregon HB 2834 (2019)
 - Calls for a Wildlife Corridor and Safe Road Crossing Action Plan, including priority project list
 - Directs ODOT, when conducting road projects that threaten wildlife connectivity, to identify wildlife corridors that may be threatened and include a mitigation plan in the environmental impact statement for the road project.

More coming....

Governor Polis' Executive order

- Directs Colorado Division of Parks and Wildlife (CPW) to compile a status report of migration corridors and seasonal habitat that conveys known locations and threats, identifies science/research gaps, makes prioritizations on information needs, identifies funding sources for research, and sets a timeframe for regular updates to the status report.
- Directs Colorado Dept. of Natural Resources to identify policy, regulations, and legislative opportunities to ensure the conservation of migration corridors and seasonal habitat.
- Directs CPW to incorporate migration corridors into the agency's public outreach and education programs.

Governor Polis' Executive order

- Directs Colorado Dept of Transportation (CDOT) to enable safe wildlife passage and reduce wildlife-vehicle collisions and to incorporate migration information into “all levels” of the dept’s planning processes.
- Directs CDOT and CPW to enter into an MOU in order to formalize how the two agencies will integrate existing and proposed policies on this issue, identify priority areas for wildlife crossings, and to support the Colorado Transportation Alliance as a forum to raise awareness, partnerships, and funding.

Where it can go wrong

- Fremont County, Idaho
 - A citizen's group formed to oppose a wildlife friendly transportation project, claiming it would restrict access and weaken private property rights/values
 - A non-binding resolution was put on the November 2018 ballot regarding support or opposition to the project.
 - Agencies and project supporters were caught off-guard and unable to engage and educate local citizens in a way that could compete with the opposition campaign.

Considerations

- Institutionalize your interest
 - Write it in a job description, or dedicate FTE.
 - MOU with sister agency and other relevant stakeholders.
 - Create policy/guidance/memoranda that memorialize your commitment and proposed actions.
- Leave no stone unturned looking for dollars
 - Brief your legislative liaisons or lobbyist(s) on needs and importance
 - Create working groups with NGOs and landowners to seek funds from private, local, state, and federal sources.
- Tell a good story
 - Don't underestimate the importance of inspiration

Considerations

- Create a body of people that include external stakeholders that will hold you accountable and keep you engaged.
 - Advisory committees, alliances, work groups, steering committees.
 - Can cover multiple needs, e.g. identification/science, funding, public outreach, etc.
- Interact with the public.
 - Host regional or statewide gatherings to share data, solicit input, and build support. Coordinate with counties, cities, NGOs, and landowners.
 - Develop online tools for understanding and visualizing the issue.