Mitigating Wildlife-Highway Conflict in Colorado: Priorities, Projects & Partnerships

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Credit: Colorado Department of Transportation, Colorado Parks and Wildlife, & ECO-resolutions
History of Wildlife-Highway Mitigation in Colorado

• 1970’s and 80’s
  - Earliest wildlife crossing structures installed:
    • Box culvert under I-70 near West Vail
    • Arch culvert under SH 160 west of Durango
    • Span bridges under I-70 Vail Pass
  - Wildlife fencing and one-way gates
  - Early CPW research on mitigation effectiveness
    • Deer behavioral responses to crossing structures
    • Structure features that influence crossing use, e.g., skylights & flood lights
Current Status of Wildlife-Highway Mitigation

2000’s and Beyond....

• Over 50 dedicated wildlife crossing structures across the state
  - Most crossing structures in CDOT Regions 3 & 5
  - Early structures installed prior to development of road ecology field and knowledge about
    ‘what works’ for different target species

• Wildlife fencing projects
  - I-70, I-25, SH 82
Current Status of Wildlife-Highway Mitigation

- Animal detection systems
  - SH 160, Bayfield
  - US 6, Golden at-grade crossing system

- Retrofitting existing bridges or culverts
  - C-470, Dutch Creek Bridge wildlife fencing and escape ramps
  - Small mammal shelves through drainage culverts

- Signage
  - Low effectiveness
Right-of-way Fencing

- ROW fencing and/or livestock fencing along most highways
- Possible solutions  Coordinate with adjacent landowners:
  - Remove all unnecessary fencing
  - Choose wildlife-friendly fence options
  - Create temporary seasonal openings
    - Time pasture rotations so livestock are absent when wildlife are present
Number of Wildlife Crossings By County*

*Structures constructed since 1970 with considerations for large or small fauna passage, or that have been fenced or retrofitted to promote wildlife passage.
Planned Crossing Structures

- US 24, Chaffee County
  (new bridge underpass; retrofit CBC)
- US 160, La Plata County
  (2 large mammal underpasses)
- US 160, Archuleta County
  (2 large mammal underpasses)
- US 550, Ouray County
  (1 large mammal underpass)

The Last 5 Years of Dedicated Wildlife Crossings (2012-2016)

Source: CDOT and ECO-resolutions
Map 17-078 created by RMW 6/2017
Identifying Priority Areas: Where to Mitigate?

Establish need for mitigation:

• High wildlife-vehicle collision areas
  - Accidents reported to law enforcement
  - Carcass reports (CDOT maintenance)

• Wildlife movement areas
  - Seasonal migration paths
  - Within home range movements
  - Dispersal movements between populations

Need for standardized datasets available in centralized data repository
Past Prioritization Efforts

• Linking Colorado’s Landscapes
  - SREP 2005 – first statewide effort to identify wildlife road crossing zones

• CDOT Research
  - Crooks et al. 2006 – prioritize highway segments based on safety, lynx and wolf
  - Barnum 2003 – guidance for identifying wildlife road crossing locations

>> Not directly implementable into transportation projects

• I-70 EcoLogical (2011)
  - Identified specific wildlife road crossing zones along I-70 Mountain Corridor
  - Used to inform mitigation planning and design, e.g., Twin Tunnels, Floyd Hill
Identifying Priorities at the County Scale

• Independently, a need for a landscape connectivity vision was identified in both Eagle and Summit Counties.
  - *Eagle*: Connectivity highlighted as a value in Comprehensive Master Plan.
  - *Summit*: CDOT provided funds for multiple wildlife projects as compensation for impacts for a highway realignment in the county.
Identifying Priorities at the County Scale

Stakeholder engagement, a process for creating a common vision

- Series of workshops to identify and prioritize road segments
- Landscape analysis to map broader movement linkages beyond the highway
- Field assessment of mitigation opportunities
- Stakeholder verification:
  - Engineering considerations
  - Competing values, land uses
  - Funding and partnership opportunities
Copper Mountain
Ski Area
Breckenridge
Town of Breckenridge
Breckenridge Resort
Mine & Tailings
Backcountry Recreation
Backcountry Recreation
Backcountry Recreation
SH 91
SH 9
1-70
1-70
Copper Mountain Ski Area
Backcountry Recreation
County-scale Connectivity Planning Outcomes

• Promote collaboration for achieving connectivity goals
  - Better consideration of connectivity across jurisdictional boundaries

• Stakeholder advancement of conservation/mitigation goals in highest priority linkage areas
  - Common landscape vision for all entities
    • Connectivity as one of many values for informing land use decision-making
  - Highlight tangible conservation actions and highway mitigation needs
  - Leverage partnerships and access to funding ensures that limited $$ are spent on projects supported by our community with maximum benefit to wildlife
Identifying Priorities at the Regional Scale

**West Slope Wildlife Prioritization Study**

- Identify wildlife/highway conflict zones under current and future scenarios
- Establish need for wildlife mitigation
  - Current and future safety hazard
  - Wildlife movement needs
  - Improved valuation of the costs and benefits of mitigation

- Partners
  - *CDOT and CPW*: Leading prioritization effort
  - *Jacobs team*: Conducting study
  - *Broad partnerships*: Implementation
Regional Connectivity Planning Outcomes

**Decision-Support Framework**

- Wildlife/highway priority segments
  - Primary and secondary priorities
  - Mitigation recommendations and cost-benefit
- Integration into CDOT planning and project development
- CDOT/CPW collaborative processes and other inter-organizational collaborations
- Funding opportunities and partnerships
  - Integrate mitigation recommendations into upcoming projects
  - Create new standalone projects
Implementing Priorities
Colorado’s First Comprehensive Wildlife Mitigation Project - State Highway 9

Wildlife Crossing Structures
- 2 overpasses – *first in CO!*
- 5 underpasses

10.4 miles Wildlife Exclusion Fencing

Wildlife Escape Ramps

Pedestrian Walk-through Gates

Deer Guards at all roads/drives
State Highway 9 Funding Partnerships

• Known problem area for wildlife-vehicle collisions
  - 2001, Original discussions started and stalled
  - 2010-2011, Project spearheaded by local Blue Valley Ranch:
    • Re-engages CDOT and Grand County
    • Donates $950,000 for design
  - 2013, Grand County applies for CDOT RAMP funding for shelf-ready project
    • Requires 20% match raised in 45 days
    • Successful because of identified need, Blue Valley Ranch and community support
State Highway 9 Agency Collaboration and Mitigation Design

• 2011-2014: Design
  – Transportation and Wildlife agencies worked together to design wildlife mitigation components with expert consultant input
  – Wildlife agency gave presentations to educate DOT staff about wildlife concerns
  – Partners hosted community outreach and educational presentations

• 2014-2016: Construction
  – Wildlife agency participation in DOT’s weekly construction review meetings
SH 9 Research Partnership

• Five-year research study to measure mitigation effectiveness
  - *CDOT Research*: Primary funder
  - *CPW*: Research support and funding
  - *ECO-resolutions team*: Contracted researchers
  - *Muley Fanatics, Rocky Mountain Elk Foundation and Grand Foundation*: Funding support

• Expanded research scope to test different mitigation designs and inform future projects
Successful Partnerships, Successful Projects

• Implementing a common vision across boundaries
  - Identify agency and other partner roles and capabilities:
    • **CDOT**: Integrate mitigation and best practices into transportation projects
    • **CPW**: Provide wildlife expertise and align staff to collaborate on transportation projects
    • **Forest Service, BLM**: Habitat and resource management
    • **Counties**: Integrate areas prioritized for wildlife connectivity into land-use decision-making and permitting
    • **NGO’s**: Public education, conservation properties and easements
    • **Private Landowners, Citizens Groups**: Galvenize landowner and community support
    • **ALL**: Bring unique expertise and resources to the table; leverage funding
Credit: Colorado Department of Transportation, Colorado Parks and Wildlife, & ECO-resolutions

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