Transportation Ecology: Calling Conservation Engineers to Action

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Objectives

- Highlight some impacts to wildlife from highways
- Describe how and why US 97 Lava Butte is novel
- Describe ways for Conservation Engineers to use their talents to bring solutions
This agent is unique

- It kills outright
- It removes habitat and replaces it with expanses of barren surfaces
- It slices habitat by creating a barrier to movement
- It’s noisy and carries frequently noisy people into remote habitat
- It creates noxious fumes and salts
Two Major Impacts: Mortality and Avoidance

Proportion of animals successfully crossing the road,
\[(1-R)(1-K)\]

Proportion of animals avoiding the road, \(R\)

Proportion of animals killed, \((1-R)K\)

Two Major Impacts

- Mortality from vehicle collisions
- Loss of habitat connectivity
- Most impacts from highways are related to *traffic volume*
Major Issue 1.
So what’s the problem with a few road pizzas?

• Vehicle-caused wildlife mortality estimated at **ONE MILLION** vertebrates each day in US (Lalo 1987)

• Virtually all wildlife species affected
Major Issue 2: Loss of habitat connectivity

- Permeability: The landscape’s ability to allow an animal’s free movement to all parts of its range
- Different species have different tolerances to highways, so highways act as ‘filters’ that change an area’s species mix
US 97
Lava Butte to S. Century Drive
Deer Population Statistics

- N. Paulina unit = 8100 (1950’s)  4400 (2000’s)
- 1,732 RK documented on 150 miles of Hwy between fall of 2005 to fall 2009
- 400/year
- 19 documented per year in project area
- 5x19=95 (number used for the cost benefit analysis)
WILDLIFE CROSSING LANDSCAPE CONCEPT III

The wildlife crossing design includes a buffer, wildlife corridor, and a vegetative buffer strip along the highway to create a wildlife-friendly corridor. The corridor would be designed to enhance connectivity and provide a safe passage for wildlife across the roadway.

The design features include:
- Vegetative buffer strip
- Forward and reverse approaches
-EXISTING HIGHWAY
- WILDLIFE CROSSING
- VEGETATION BUFFER
- OVERHEAD LANDSCAPE BRIDGE
- WILDLIFE CROSSING ELEVATION

Deschutes National Forest
U.S.D.A. Forest Service: Pacific Northwest Region

WILDLIFE CROSSING

Environmental Planning

ELEVATION

Design Concept:
WILDLIFE CROSSING LANDSCAPE PLAN

RUT 77 - CRAWFORD ROAD
Ecosystem Passage Features

- Soil retained and replaced under underpasses
- Compost mulched onsite
- Passive water system
- Structure including boulders and logs added
- Onsite native plants reserved, propagated and replanted
- Visuals considered at north underpasses
What can conservation engineers do?

- Engage other disciplines in road and highway projects, especially where culverts and bridges are present.
Learn More

• Innovative Approaches to Wildlife and Highway Interactions
Plan for wildlife passage

• Corridor K Tennessee options for overpass
Watch for opportunities

- Retrofitting existing structures
- Replacing structures
- Bat structures
Avoid making new problems

• Especially rip-rap!
Typical Nebraska Bridge Undercrossings

Riprap
Maintenance may provide opportunities
Operations can be improved

- Deicing cinders can cause problems
Watch Aquatic Organism Passage projects

- Avoid reducing terrestrial access
The future?

More sophistication in crossing structures
The future: Restoration of existing highways

- New structures
- Retrofitting existing structures
The future: Transit options

Amount of space required to transport the same number of passengers by car, bus or bicycle.

Car?  Bus?  Bicycle?

(Poster in city of Muenster Planning Office, August 2001)
The future: SOP

Safer roads for people and wildlife

Drawing by Maitland Johnson, age 11, of Lincoln Elementary School in Ellensburg, WA

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