Boeckman Road Wildlife Crossing Structures

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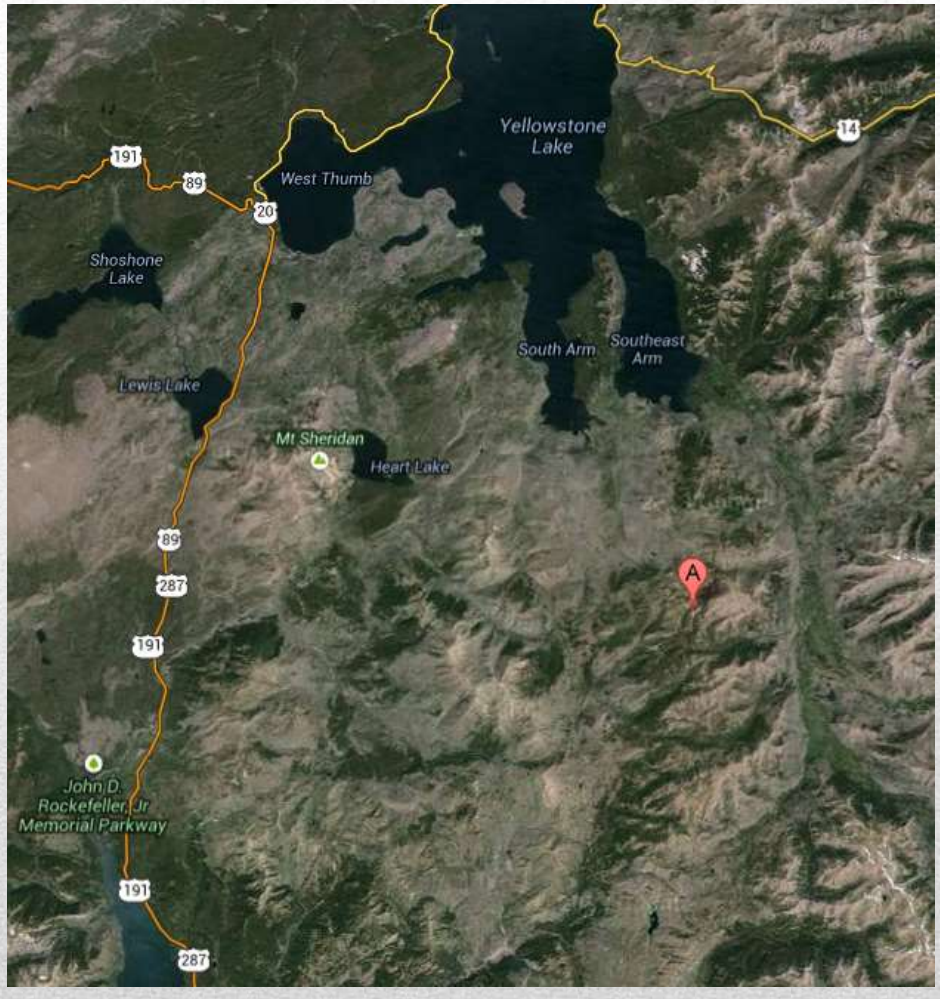
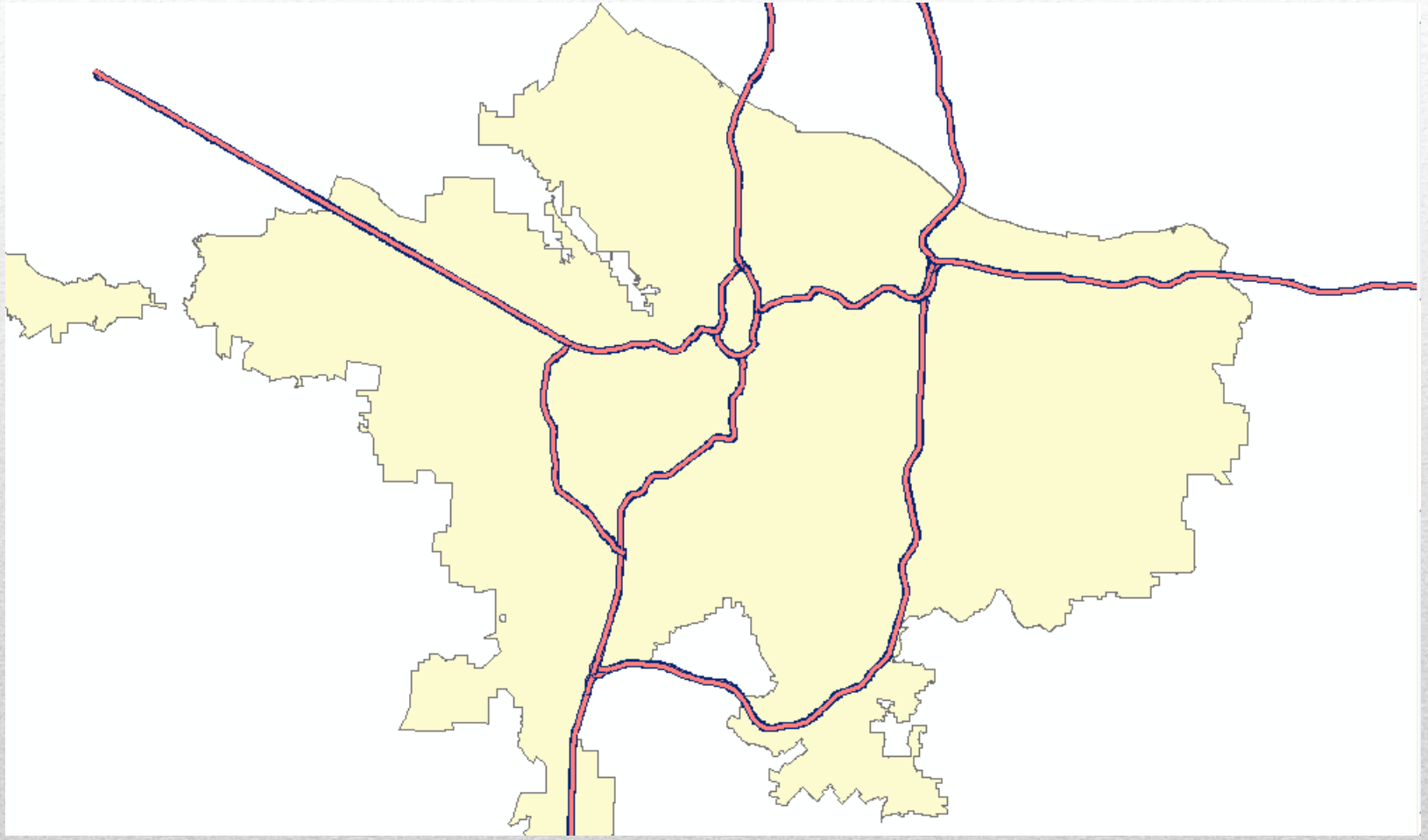
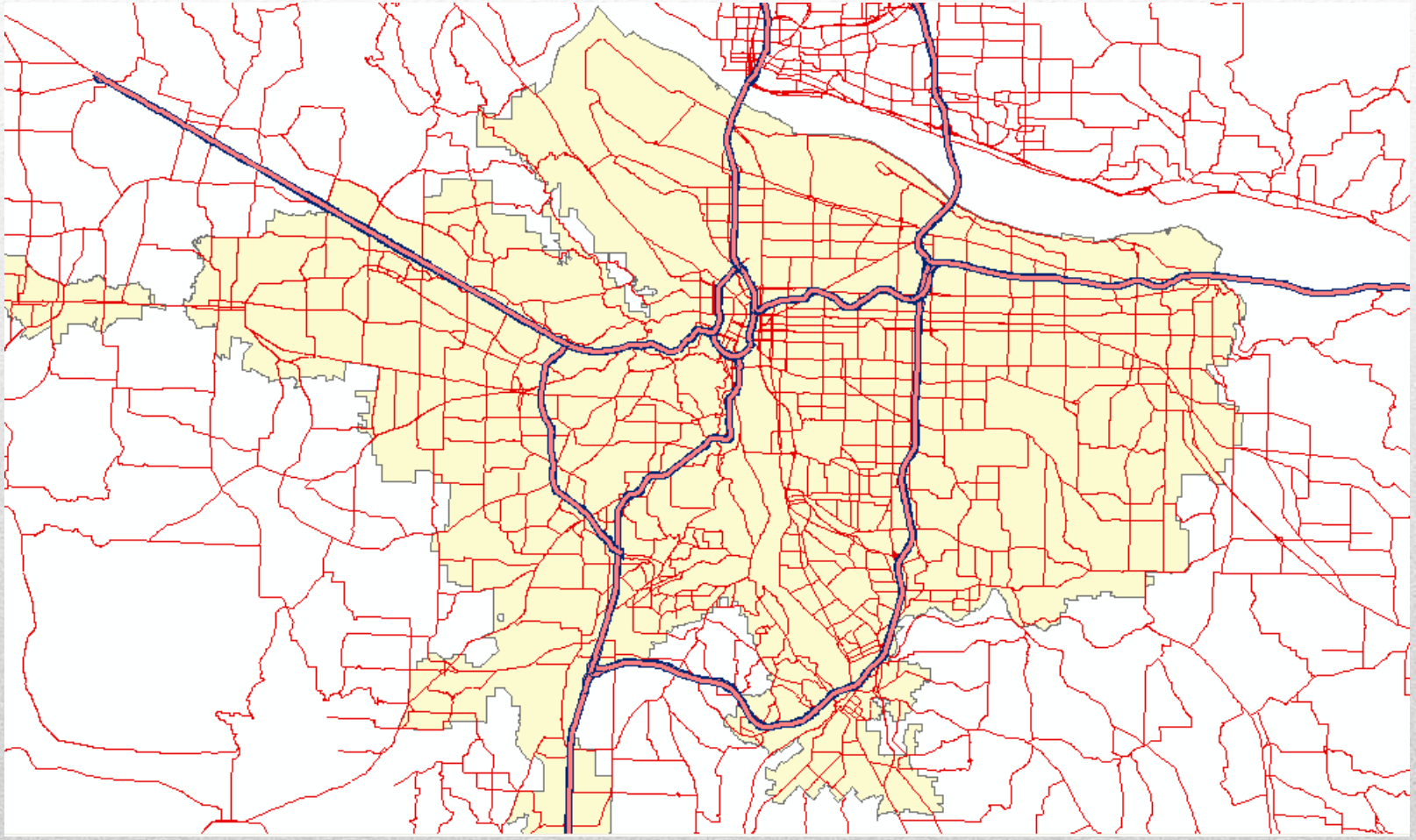
Leslie Bliss-Ketchum

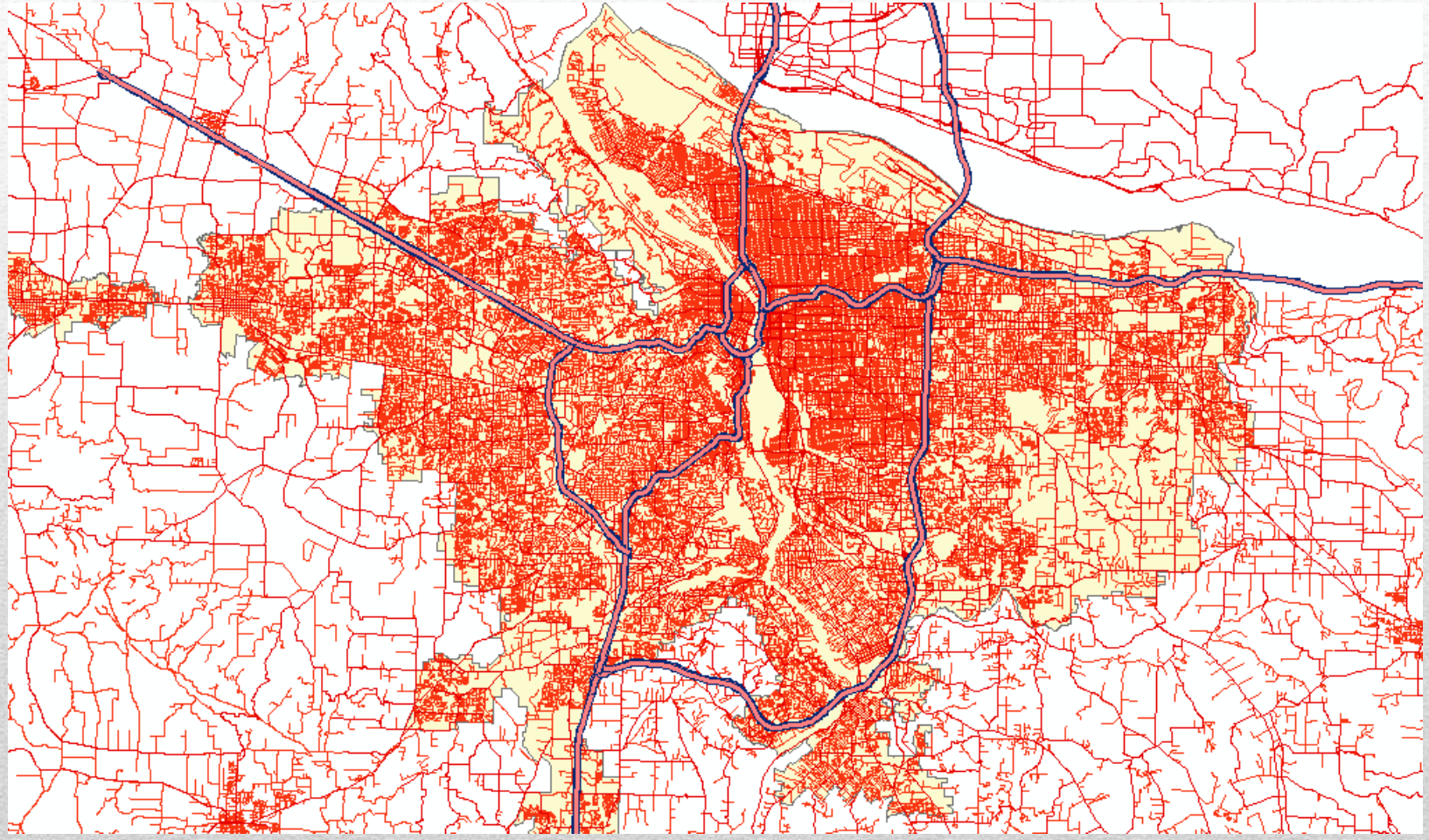
Road Ecology

- In the lower 48 the farthest you can possibly be from a road is **20 miles**
- 1/5 land area in the US ecologically affected by roads (R.T. T.Forman 2000)









Ecological Impacts of Roads

- Air
  - vehicle emissions, dust
- Water
  - stormwater contamination
  - impervious surfaces
- Soil
  - deposition (water & air) and accumulation
  - erosion

Wildlife Impacts

- Direct Mortality from Collisions
- Avoidance Behaviors
- Habitat Connectivity & Gene Flow Interrupted
- Local Extinctions

Photo Credit: http://www.roadkilltoys.com/

Health & Economy

- Impact on Humans from Collisions
- Per Year in the US:
  - 1.5 million deer collisions
  - $8.3 billion in damages
  - 200 deaths

- Passage structures
  - under & over-road crossings
- Prevention fencing

Mitigation for Road Mortality

Boeckman Road Wildlife Crossing Structures


Boeckman Rd
Boeckman Rd
Boeckman Rd
SW 110th Ave


Bridge
1.5’
1.5’
4’ x 9’
2’
1.5’
2’

Monitoring & Passage Preferences

- Document wildlife use of passage structures
- Examine potential passage preference within the vertebrate wildlife community

Detection Methods

Major Conclusions

- Passages are being used frequently by a wide variety of species
- Greatest abundance, richness and diversity in largest structure
- Surprising trends in species groups preference (i.e. native amphibians)

Testing for road avoidance behavior

Small mammal mark-recapture study

Reptile/amphibian response to road presence

Pre/post monitoring after adding dry passage to a wet crossing


2011-10-09 11:42:30 AM M 173
15°C
RECONYX


2011-10-09 11:42:32 AM M 273
15°C
RECONYX


2011-10-09 11:42:33 AM M 373
15°C
RECONYX

Wildlife response to the presence of artificial light

- Structures for wildlife and humans
- Human structures will likely include lighting for safety
- Need for more information on how artificial light will alter effectiveness of passages

Dual use structures

Community level response

Characterizing the effect of artificial light on the behavioral response of the terrestrial vertebrate community



Nocturnal (1038)

Diurnal (105)

Crepuscular (372)

Conclusion

Detectable differences in the community using crossing structure in the presence of artificial light

Clear avoidance for nocturnal and crepuscular species

Variability by species

Implications

Indication of a landscape level “filtering” effect and/or increased road mortality

Artificial light increasing habitat fragmentation effects for nocturnal and crepuscular species

Future Work

Exploration of different spectrums (red, green, others) and different light sources (LED, florescent, others)

Long term monitoring

Pre/post road closure wildlife activity monitoring

- Great benefit to wildlife
- Research and learning opportunities
- Enhanced understanding of wildlife and road interactions

Summary


2009-08-23 4:56:05 PM M 3/3
38°C
RECONYX


2010-07-30 12:53:56 PM M 2/3
34°C
RECONYX


2010-06-21 9:22:34 AM M 1/3
28°C
RECONYX


2010-05-20 11:27:03 AM M 2/3
16°C
RECONYX


2010-08-07 5:45:25 AM M 1/3
57°F
RECONYX


2010-08-19 6:34:39 AM M 3/3
13°C
RECONYX


2009-10-08 12:20:37 AM M 3/3
1°C
RECONYX


2009-07-30 2:53:02 AM M 2/3
62°F
RECONYX


2011-11-03 1:41:36 AM M 1/3
44°F
RECONYX


2011-11-03 1:41:37 AM M 2/3
44°F
RECONYX


2011-11-03 1:41:38 AM M 3/3
44°F
RECONYX


2011-11-03 1:41:41 AM M 1/3
44°F
RECONYX


2011-11-03 1:41:42 AM M 2/3
44°F
RECONYX


2011-11-03 1:41:43 AM M 3/3
44°F
RECONYX


2011-11-03 1:42:05 AM M 1/3
44°F
RECONYX


2011-11-03 1:42:06 AM M 2/3
44°F
RECONYX


2011-11-03 1:42:07 AM M 3/3
44°F
RECONYX


2011-11-03 1:42:23 AM M 1/3
44°F
RECONYX


2011-11-03 1:42:24 AM M 2/3
44°F
RECONYX


2011-11-03 1:42:25 AM M 3/3
44°F
RECONYX


2011-11-03 1:42:29 AM M 1/3
44°F
RECONYX


2011-11-03 1:42:30 AM M 2/3
44°F
RECONYX


2011-11-03 1:42:31 AM M 3/3
44°F
RECONYX


2011-11-03 1:42:32 AM M 1/3
44°F
RECONYX


2011-11-03 1:42:33 AM M 2/3
44°F
RECONYX

Thank you