RFP Solicitation Number:  2015-02

Research Title: Effectiveness of Wildlife Mitigation Treatments on the Nelsonville Bypass

Problem Statement
U.S. Route 33 Nelsonville Bypass is a three-phase, 8.5-mile new construction of four-lane highway through Athens and Hocking County Ohio with a large portion bisecting Wayne National Forest, Ohio’s only National Forest. The Ohio Department of Transportation (ODOT) has worked closely with resource agencies and the Wayne National Forest to incorporate several mitigation treatments to protect wildlife in the area. The project was designed to restrict wildlife access to the highway to reduce vehicle wildlife interactions. However, the design also incorporated several features to make it permeable to wildlife migration.

Of the multiple techniques used to restrict and reduce wildlife access to the highway, deer jump-outs are of particular interest because deer could be using the jump-outs to re-enter the highway. Further, there is no data to access the other features and how they are performing. For example, it has been observed that deer could be using the jump-outs to enter the highway and this study will investigate the use of the jump outs as well as identify measures that would restrict deer from using the jump-outs jumping back into the ROW. Factors that influence the use (jumping out of the ROW) and misuse (jumping in to the ROW) could include the landing substrate, width of exit, height of exit, or other factors.

Goals and Objectives
The goal of this research is to assess the effectiveness and use by wildlife of the mitigation measures installed. This research will provide greater insight on design, functionality, and implementation of the wildlife mitigation treatments currently employed along the Nelsonville Bypass as it bisects Wayne National Forest.

Proposed Research
This study will investigate the functionality of the following wildlife mitigation treatments:
- High-mast lighting for bats
  - o monitor bat activity and behavior at lighting locations.
- Wildlife jump-outs for deer
  - o monitor deer jump outs, develop and implement a study of variables that increase the use of jump outs and eliminates or reduces deer from using the jump outs to enter the ROW.
- Wildlife movements through the gas-line underpass bridge
  - o monitor wildlife use of this structure.
- Timber Rattlesnake fencing and crossing
  - o monitor the use and effectiveness of the fencing used to exclude snakes from ROW and the culvert installed to allow for safe migration beneath the roadway.
- Ambystomid crossings
  - o monitor the use and effectiveness of the fencing used to exclude mole salamanders from ROW and the culvert installed to allow for safe migration beneath the roadway.
- ATV/Wildlife Crossing
  - o monitor wildlife and ATV use of the crossing to determine the effectiveness of a multiple use underpass structure shared by both wildlife and low volume motorized traffic.
- Crossings for safe passage for various wildlife
  - o monitor all wildlife use of crossing structures.
For the following, the researcher will research the long term sustainability of the features and provide implementation guidance for future crossings. It is anticipated that the majority of wildlife observations will be made using remote sensing (i.e. – cameras/video).

1) The researcher will investigate the use by wildlife of the following features
   a) The researcher will observe wildlife use of these features:
      i) Snake Culvert – 48” culvert Station 193
      ii) Critter Crossing – 48” culvert Station 82
      iii) Wildlife Arch Culvert (28’ wide) and two bat houses Station 330
      iv) Ambystomid Crossings (2) State Rt. 78 Station 119+50 and 120+50
      v) Wildlife Underpass Bridge and two bat houses Station 116
      vi) ATV/Wildlife Crossing – 10’ wide box culvert Station107+50
   b) The researcher will provide recommendations, if needed, on ways to enhance the use of the existing features based on observations and best current scientific research.
   c) The researcher will also provide design guidelines for future projects. For example it could be determined that smaller structures could have provided the same wildlife benefit at a substantial cost savings.

2) The researcher will investigate the use and effectiveness of 16 existing deer jump-outs:
   a) The researcher will observe deer behavior and use of the jump-outs.
   b) The researcher will research and investigate variables that influence the use or misuse of the deer jump-outs. These variables could include:
      i) height
      ii) entry/exit width
      iii) landing substrate
      iv) vegetation placement and control
   c) The researcher will design an experiment testing a limited number of easily modified variables from above in an effort to understand the variables that enhance correct use of the jump-out. For example, does varying the landing substrate (i.e.-hard vs. soft) influence the deer use of the jump-outs?
   d) The researcher will review the design of the jump-outs, results of the monitoring, and provide insight on practicable suggestions for the enhancement of the deer jump-out features, if necessary, as uncovered by the research.
      i) Are deer using the jump-outs to exit and enter the ROW?
      ii) Are there design variables that influence the use or misuse of a jump-out?
         (a) Are there simple changes to the existing jump-outs that would increase correct use?
      iii) What variables can be incorporated in a future design to encourage appropriate use of the jump-out?

Requirements of the Research Team:
The research team should have a strong demonstrated knowledge of (e.g. - peer reviewed publications on wildlife research), wildlife ecology, human/wildlife interactions, road ecology and transportation, or similar subject matter.

The researcher will be required to procure and provide all necessary equipment for the project. Any equipment procured with the use of the research funds will be turned over to ODOT at the end of the project. The researcher will be required to obtain any necessary scientific collectors permits from the ODNR Division of Wildlife and the U.S. Fish and Wildlife Service (if federally listed species will be collected) if surveys include the collection of any animal species. The proper permits will also need to be obtained from the Wayne National Forest to collect any species on National Forest Property.

Assistance from ODOT
Right of way permit and access, plans and locations of wildlife features, ecological survey report of the area prior to construction, and any other assistance as needed.

Project Specific Deliverables
Suggested design guidelines for each treatment included as an Appendix in the Draft and Final reports.
**Research Contract Deliverables**

- Quarterly progress reports (provided electronically).
- Electronic copies of the draft final report and draft executive summary shall be submitted 120 days prior to the contract completion date.
- Five copies of an approved final report, five color copies of an approved executive summary, and a PDF and MS DOC version of both documents shall be submitted by the contract completion date.
- Article for the Research newsletter (to be provided upon request).
- Participation in the following meetings: project start-up, research review session (1 per year), and research results presentation.

**Benefits**

This research will determine if the wildlife treatments are functioning as intended. This is important as a large amount of capital investment was made in these treatments. Further, this research will assist ODOT in designing these treatments for future projects, or indicate that they are not effective.

**Potential Application of Research Results**

1. Improved safety for the traveling public and wildlife
2. Improved design for current and future treatments

**Preliminary Literature Search Results**

   Cramer, P., 2012
   Utah State University Department of Wild-land Resources and Utah Transportation Center.
   Paper one evaluates the use of wildlife crossing structures in Utah.

   Cornell Cooperative Extension.
   Paper two discusses alternative management methods for white-tailed deer including fencing techniques, palatable vs. unpalatable vegetation selections and non-lethal deterrent techniques.

   Paper three discusses different types of wildlife crossing structures and factors that influence their effectiveness.

**Duration**

29 months (includes four month draft final report review period)