

0-6972: Assessing Traffic Threats for Amphibian and Reptile Species of Greatest Conservation Need on Texas Roadways

Background

As part of the National Environmental Policy Act (NEPA) process, transportation planners must be responsive to both state and federal Departments of Fish and Wildlife when making determinations about potential transportation project impacts on threatened and endangered (TE) species. Wildlife vehicle collisions (WVCs) are one potential negative impact of transportation projects, and mitigation is critical to both driver safety and TE species survival. Accurately predicting and prioritizing places for mitigation of WVC impacts to drivers and TE species is an important step in the transportation planning process.

What the Researchers Did

The research team collected locality data and assessed WVC impacts for amphibian and reptile species on Texas roadways from 2012 to 2018 using the “Herps of Texas” project on the citizen science platform iNaturalist. A total of 11,527 records of 62 SGCN amphibian and reptile species were used to create a geospatial database of occurrences and road mortalities in Texas. Using this database, the research team produced maps depicting “hotspots” and “hot moments” of WVCs involving the target species to help predict and prioritize places for mitigation of WVC impacts for transportation projects throughout the entire state of Texas. The research team then used Texas road traffic data from the Texas Department of Transportation (TxDOT) to determine if traffic volume best explained the frequency of WVCs for target SGCN in the database. Finally, the research team summarized all findings by creating a “watch-list” of SGCN and TE species that are most likely to impact transportation projects throughout Texas, and then used this information to prepare a Value of Research (VoR) report

highlighting both economic and safety benefits of this research.

What the Researchers Found

Using the geospatial database, the research team identified which species were most likely to cross roads throughout Texas, where and when, and whether they survived the encounter. The maps generated from this database can help identify the causes of WVCs by visualizing TxDOT road segments with the highest crossing rates and mortality rates for SGCN amphibians and reptiles in Texas. By analyzing those WVCs, the research team determined that shorter distances to roads, higher traffic volumes, latitude, and longitude were important predictors of mortality across all SGCN observations. With respect to environmental impacts involving state SGCN and federally listed TE species, the research team found that some amphibian and reptile species groups were more likely to complicate transportation project planning than others and for different reasons. Accordingly, the

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research team developed a “watch list” for each of these species groups to help guide future transportation project planning. The economic benefits of this research were significantly higher than the cost of implementing the research, including periodic future updates to the geospatial database and subsequent analyses. In addition, given the state-wide scope of this project, its benefits and value are far-reaching and improve the safety of drivers in Texas by helping to reduce WVCs.

What This Means

Transportation project planning and delivery are complicated by natural resource and environmental issues, many of which involve state and federally listed TE species. To avoid unexpected project costs and schedule delays, environmental impact considerations involving TE species, and the risk of WVCs in particular, must be identified early in the project planning process. To help predict and prioritize places for mitigation of impacts to TE species, this project created a database tool capable of identifying which species were most likely to cross specific roads throughout Texas, where and when, and whether they survived the encounter.

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