

# **BLACK BEAR MOVEMENTS AND HABITAT USE RELATIVE TO ROADS IN OCALA NATIONAL FOREST**

## **PROBLEM STATEMENT**

Bears in Florida are restricted to six geographically isolated core populations. Collisions with vehicles are the primary source of mortality for most bear populations in Florida. The impact of highway mortality and habitat fragmentation caused by highways is significant for bears in Florida. The Ocala area bear population has accounted for more than 45% (554 of 1,219) of the state's bear highway mortality since 1976. State Road 40 (SR-40) is among the most lethal roads to bears in the Ocala area. The Florida Department of Transportation (FDOT) needs information to identify the rates, patterns, and geographic focal points of bear crossings along SR-40 in Ocala National Forest (ONF) to improve highway design intended to protect this prominent umbrella species, improve motorist safety, and identify the impact of highway mortality on bears in ONF.

## **OBJECTIVES**

The goal of this study was to provide information useful for advancing roadway design, placement, improvement, and maintenance with regard to black bear conservation and management in ONF and other bear populations throughout Florida. Specific objectives included the following:

1. Determine the habitat use and movement patterns of bears captured in the vicinity of SR-40.
2. Determine the home range dynamics of bears captured in the vicinity of SR-40.
3. Provide an abundance estimate of bears within the study area portion of ONF.
4. Determine survival rates of adult bears captured in the vicinity of SR-40.
5. Locate and analyze the characteristics of sites where bears cross SR-40 in the study area.
6. Survey the relative abundance and availability of common bear foods in ONF.
7. Synthesize the collected data to provide recommendations for reducing impacts of roads on bears in ONF.

## **FINDINGS AND CONCLUSIONS**

Researchers captured 138 bears in the vicinity of SR-40 and fitted 95 of them with radio collars to assess survival rates, bear movements, and the highway crossing behaviors of particular population segments. Researchers created a 3-meter x 18-kilometer dirt transect parallel to SR-40 in ONF, from which they recorded the locations of 2037 bear tracks to help identify temporal and spatial patterns of highway crossings by bears. Genotypes from 2,265 samples of bear hair were collected and sent to a genetics lab; the results enabled population estimates of bears in

ONF to be calculated. In addition, researchers performed ocular estimates of the abundance and distribution of 7 species of common bear foods to more fully understand bear movements and highway crossing behaviors.

Eighty-six radio-collared bears crossed SR-40 a minimum of 388 times. Female bears residing on the checkerboard pattern of private/public ownerships around the small community of Lynne where traffic on SR-40 exceeded 14,000 annual average daily car trips were less likely to cross the highway than were bears from areas with lower traffic volume. We documented annual survival rates for females in Lynne, females in the contiguous ONF, and males to be 62.4%, 92.9%, and 76.5%, respectively. The main source of mortality was vehicular collision. The survival rate in Lynne is among the lowest reported. Researchers found no effect on distribution of bear tracks by highway elevation, presence of intersecting roads and trails, highway curvature, and habitat type the track was entering or leaving. However, the distribution of historic bear mortalities was affected by highway elevation, presence of intersections, and highway curvature. The frequency of bear tracks tended to increase from winter to fall. Densities were estimated at 0.14 bears/ km<sup>2</sup> and 0.12 bears/ km<sup>2</sup> for females and males, respectively. A population of 138 bears was estimated to be within the study area. Estimates of abundance of common fall bear foods indicated a dramatic decline in availability of nutritional resources during fall 2000 that likely contributed to a spike in bear movements across SR-40.

## **BENEFITS**

This study provides abundance and survival estimates for bears in the vicinity of State Road 40 in Ocala National Forest that can be used by FDOT in a cost/benefit analysis of wildlife mitigation structures, and it will increase the efficiency and effectiveness of FDOT in properly locating wildlife mitigation structures along State Road 40 in Ocala National Forest. This study identifies highway design features that are associated with bear / vehicle collisions on SR-40 in Ocala National Forest and that can be improved to increase motorist safety and lessen highway highway impacts upon bears.

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