IMPACTS OF A 4-LANE HIGHWAY WITH WILDLIFE UNDERPASSES ON BLACK BEAR SPATIAL ECOLOGY IN EASTERN NORTH CAROLINA

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Introduction

- Growing infrastructure network

- Potential to affect large carnivore species

  -Vehicle collisions

    Low reproductive rates

Introduction

- Effects of highways on wildlife

  -Direct mortality

  -Direct habitat loss

  -Displacement and avoidance

  -Habitat fragmentation

  -Reduced genetic exchange

  -Associated human development

Introduction

- Mitigate impacts

  -Wildlife crossing structures

  -Speed limits and warning devices

Justification

- Human development will continue
- Need to better understand
  -Impacts of highways
  -Effectiveness of mitigation measures
- Umbrella species (Simberloff 1999)

Objectives

- Determine if a change in spatial ecology is present

  -Before and after highway construction

- Determine the effectiveness of wildlife underpasses

Study Area
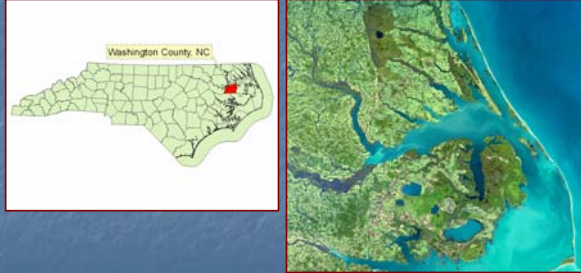

Study Area

Study Area

- Agricultural crops
- Forested land
- Limited human development

Methods

- **Livetrapping**

  -Foot snares

  -Culvert trap

Methods

- Radiocollars

  - Females >55 kg

  - Males >90 kg

Methods

- **Radiotelemetry**

  -Daily and hourly locations

  -Telemetry error
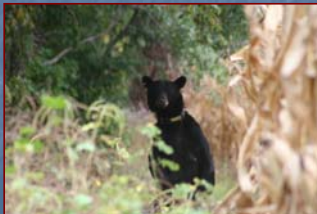
Methods

- **Calculation of Spatial Variables**

  -Home-range analysis

  -Short-term movements

Methods

- Habitat analysis

  -Habitat selection and modeling

  -Habitat variables

Methods

- Before-After Control-Impact Study design

  -Assess treatment effects

Methods

- Analysis of variance with repeated measures

  -Between-subjects factor

  -Within-subjects factor

  -Additional factors

Methods

- Track, Camera, and Road Kill Surveys

  -Track counts

  -Camera systems

  -Roadkill survey

Preliminary Results

- **Trapping**

  -Treatment area

  -Control area
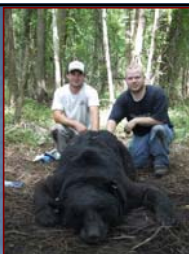
- **Telemetry**

  -Treatment area

  -Control area

Preliminary Results

- **Highway monitoring**

  -198 road mortalities

  -3,622 animal crossings

Acknowledgments

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