




## Abundance of the Louisiana Black Bear in the Tensas River Basin, Louisiana

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## Louisiana Black Bear

- *Ursus americanus luteolus*
- Historic range - East Texas to Southern Mississippi



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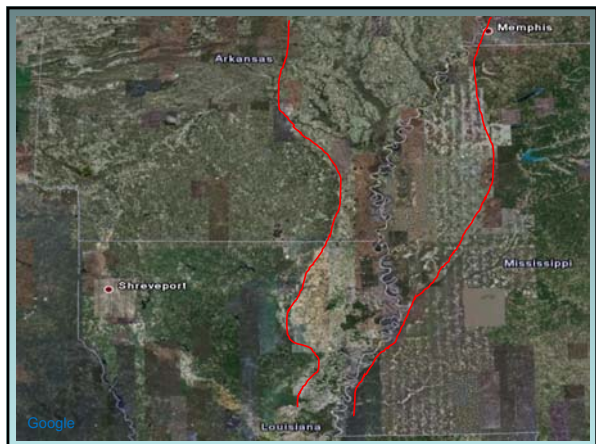
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## Background/Justification

- 1992 – listed as “threatened”
- Louisiana Black Bear Recovery Plan
- Several studies were conducted in the late ‘90s
- Limited scope
- Estimates outdated
- Anecdotal evidence suggests a population increase and distribution expansion

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## Objective

Estimate abundance of the Louisiana black bear in the Tensas River Basin

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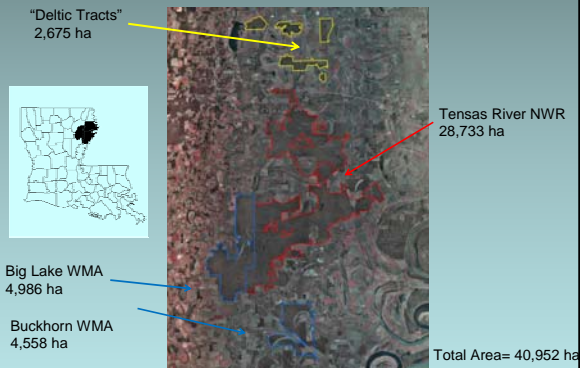
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## Study Area



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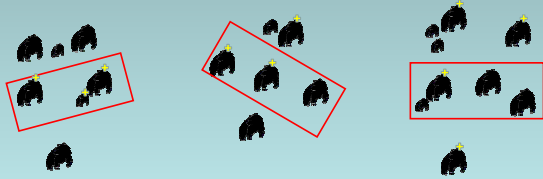
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## Methods

- Mark-recapture
- DNA “capture”
- Genetic “tagging”



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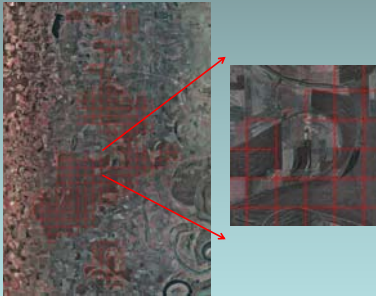
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## Sampling Grid

- Cell Size= 2.59 km<sup>2</sup>  
(or 1 mi<sup>2</sup>)

- Cells centered on  
timbered habitat

- Incomplete Cells  
a subjective call



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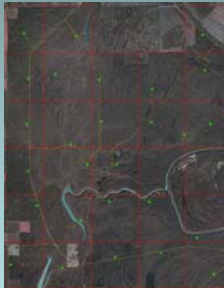
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## Site Placement

- Coverage
- Even distribution
- Ease of access



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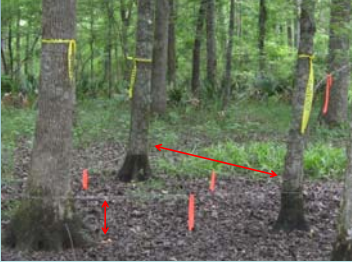
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### Field Techniques

209 Hair Collection Sites ~ 2.5m per side



40cm to 50cm high

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### Field Techniques

Hair Collection Sites

brush cleared



wire kept tight



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### Field Techniques

Hair Collection Sites



- \*baited with ~ 100 g of "sweets"
- \*scent

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## Field Techniques

### Hair Collection

Sites checked once/week for 10 weeks  
Five or more hairs per barb considered a sample



(some days you get the bear)



(some days the bear gets you)

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## Genetics/Lab Techniques

### Sub-sampling

- ~125 samples per week
- ~\$40.00 per sample

$$125 \times 10 = 1250 \times \$40 = \$50,000 \times 3 = \$150,000$$

- Randomly selecting 25 sites per sample period
- Analyzing one adequate from each selected site

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## Genetics/Lab Techniques

### Sample preparation

Clipping the "roots"



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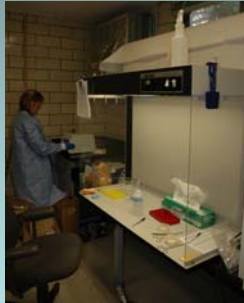
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## Genetics/Lab Techniques

- DNA extraction
- Amplification- PCR
- Genotyping/Sexing



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## Genetics/Lab Techniques

- Microsatellites
- High variability desired



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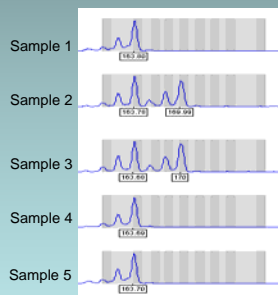
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## Genetic Analysis

### Genotyping

Bear is "tagged" with its own DNA



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## Parameter Estimation

### Closed Population Models

- Assume closure
- Estimation of detection probability bias
- Abundance estimate



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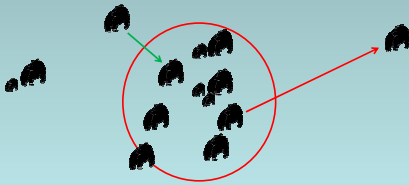
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## Parameter Estimation

### Open Population Models

- No closure required
- Less precise abundance estimate
- Robust survival estimate



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## Parameter Estimation

### Robust Design

	pop. estimate 2006	pop. estimate 2007	pop. estimate 2008
Assume closure	0101	0000	1001
Pooled data	1	0	1
		→ survival	

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## Parameter Estimation

Program MARK

- Build models
- Test for heterogeneity in detection probabilities by location, sex, time

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## Acknowledgments

- LDWF -\$
- USFWS -\$
- BBCC -\$
- Tensas River NWR staff
- Maria Davidson and LDWF staff
- John Madden and Tom Bartholomew
- Anderson Tully Timber Co.
- The Scott Family and various other landowners
- Technicians and fellow students

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