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Population Dynamics of Introduced Flathead Catfish Occurring in 2 Coastal Plain Blackwater Rivers

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Flatheads get really large in Georgia!

Ocmulgee River
Limbline 8/18/2009
103lbs-Age 18

Altamaha River
Rod & Reel 7/11/2010
83lbs-Age 12
State Record (tie)!

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Flatheads get really large in South Carolina!

Santee Diversion Canal
5/11/2001
79lbs 4 ounces
State Record (tie)

Jessica Preston, an 18-year-old Gilbert resident, caught a 79-pound, 4-ounce flathead catfish on May 11 in the Santee Diversion Canal which is the new state all-tackle record for South Carolina. Her father Dean Preston holds the big fish at right. (Photo courtesy of Canal Lakes Resort)

Cooper River
2014
79lbs 6 ounces
State Record (tie)

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Summary of Problem

- **Little Pee Dee**

- 51 flathead catfish (*Pylodictis olivaris)* were first stocked in Lake Marion in 1964 and the rest is history.
- Tied back to initial 1982 year-class with lapilla otoliths (Age-14 fish found in 1996.)
- Believed to be in the system since late 1970's or early 1980's.

- **Satilla**

- The first confirmed flathead catfish from the Satilla river, GA was caught in June, 1996

- Tied back to initial 1994 year-class with lapilla otoliths (Age-14 fish found in 2008)

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Waterbody Comparison & Management Regimes

Satilla vs Little Pee Dee

- Introduced in mid 1990's
- Population is about 20 yrs old
- pH-5.7
- Support viable sunfish populations
- Active flathead removal since 1996, increased removal effort since 2007
- 59,517 flatheads removed totaling 124, 635 lbs from 1996 to 2014
- No native fish stocking

- Introduced in late 70's early 80's
- Population is about 35 yrs old
- pH-6.0/6.5
- Support viable sunfish populations
- Little flathead removal
- Stocked several batches of redbreast sunfish since flathead introduction
- 2.7 million since 2010.

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Satilla River Redbreast Sunfish Fishery

- Satilla is known for it's "Rooster Reds"

- Restore native fish populations such as the redbreast sunfish and native bullheads back to historical levels.

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Little Pee Dee River Fishery

- Is known for its “bream”, most notably redbreast sunfish
- Some catfish bush hook fishermen
- Flathead catfish have a “Do Not Consume Any” mercury advisory
- Nearly all native Ictalurids have been decimated

Angler harvested July 2014; 1lb 6 oz

Methods

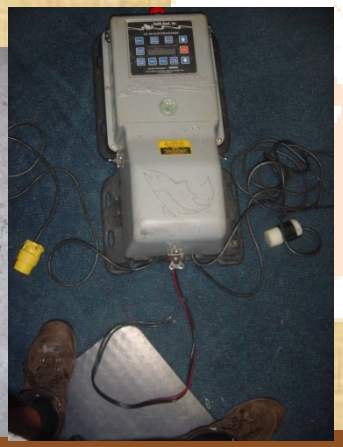
Satilla

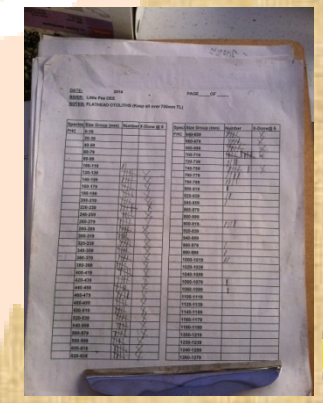
- Low amp pulsed DC electrofishing (> 1 A, 200-1000 V, 18 pps.
- Smith-Root either model 12B backpack shocker or model LR-24 model back electrofisher.
- Chase boat was used

Little Pee Dee

- Low amp pulsed DC electrofishing > 2 A, 0 – 1,200? V, 15 pps and also used Georgia gear for 2 days in June
- Smith-Root model GPP 5.0 with generator.

For age analysis: 5 fish per cm group less than 700 mm TL and all fish > 700 mm TL were sacrificed.

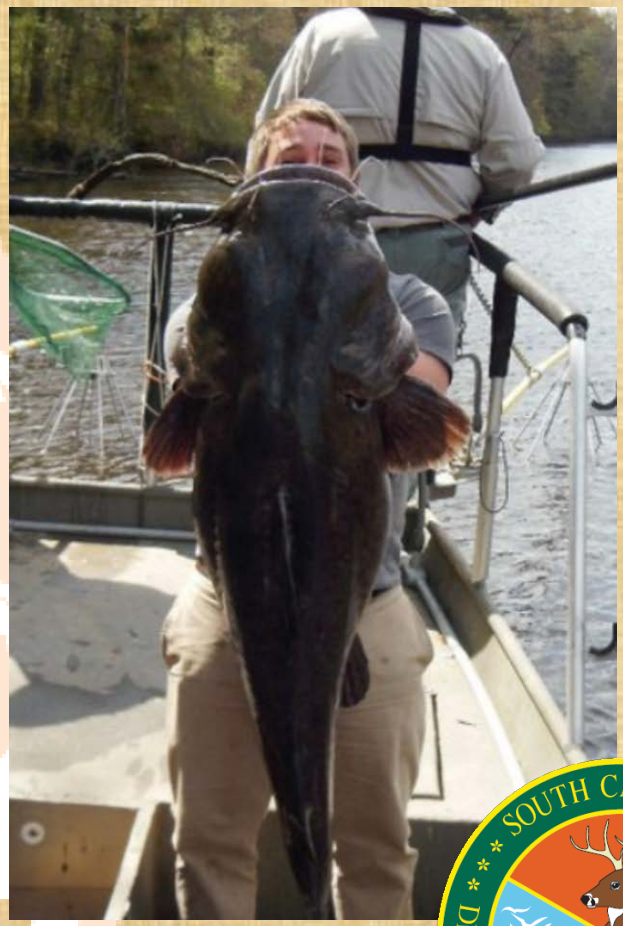




Objectives

- Describe the population dynamics of introduced flathead catfish occurring in 2 coastal plain blackwater rivers

- -Relative Abundance (CPUE)
  - Compare 2 different gears/pulses (15 pps and 18 pps)
- -Size structure
- -Age structure
- -Mortality
- -Growth



Results

Satilla

- Pedal Time: 222 hours
- Length Frequency, *N* = 16,681
- Age Sample, *N* = 279

Little Pee Dee

- Pedal Time: 22 hours
- Length Frequency *N* = 1,969
- Age Sample *N* = 277

Relative Abundance (CPE)

Satilla

- 18 pps
- CPE- 75. 1 fish/hr ± 6.7 SE

Little Pee Dee

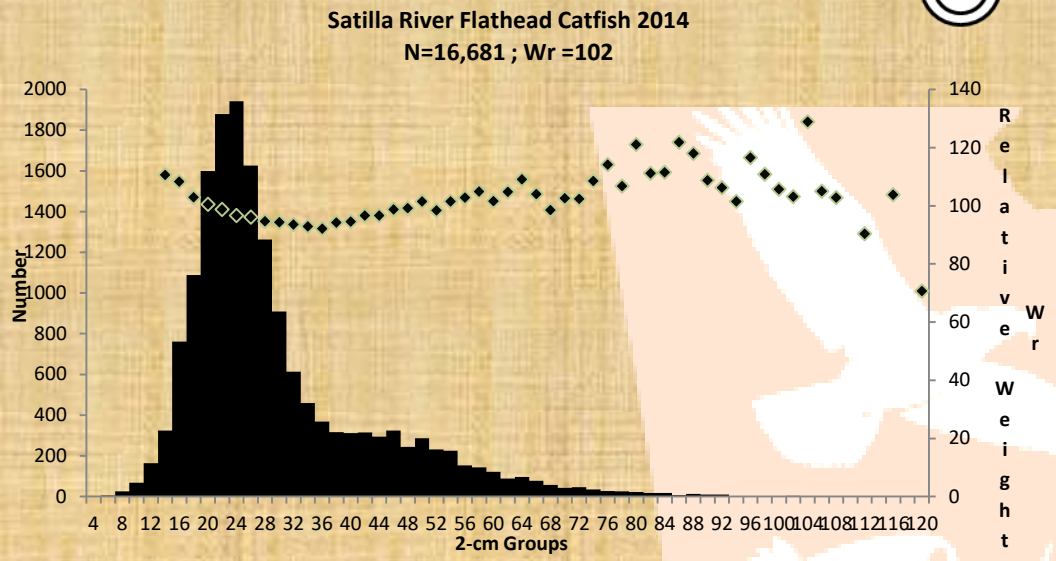
- Both Gears Combined
- CPE- 89.3 fish/hr ± 10.4 SE

- 18 pps
- CPE- 144.5 fish/hr ± 91.5 SE

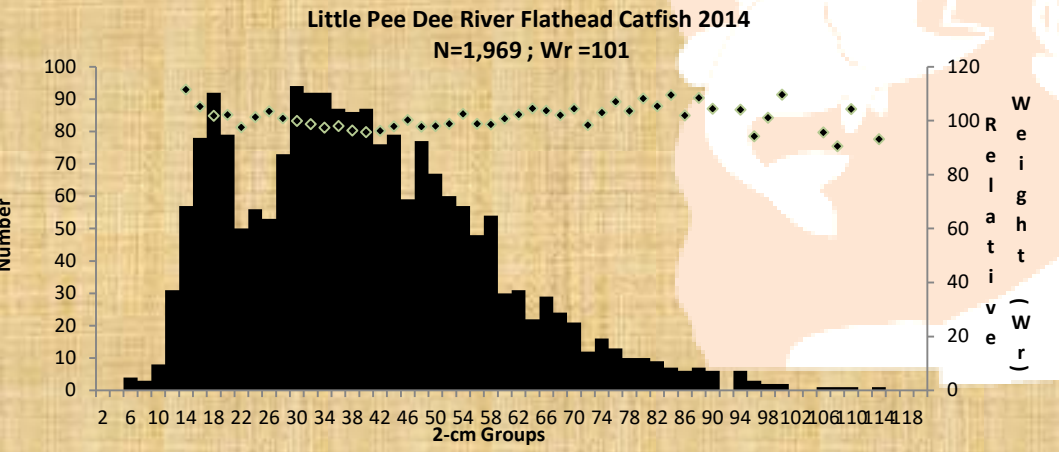
- 15 pps
- CPE- 75.9 fish/hr ± 10.2 SE

Photo by Wayne Morgan

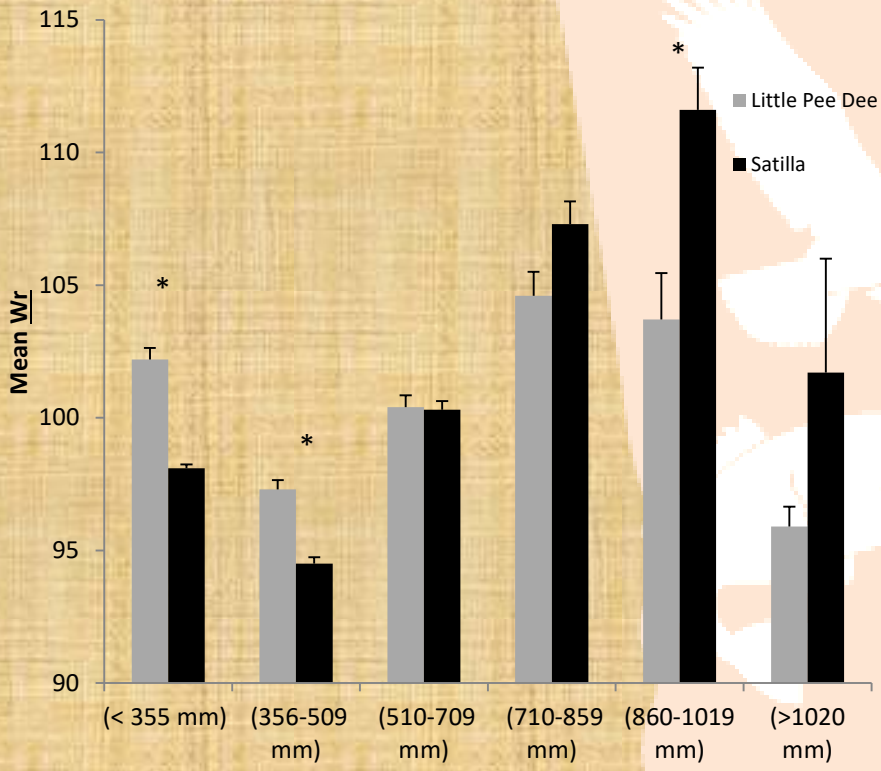
Length Frequency



- **Satilla**
- Truncated towards smaller fish
- Less older fish
- Relative Weight, Wr = 102



- **Little Pee Dee**
- More evenly distributed with larger fish
- More older fish
- Relative Weight, Wr = 101

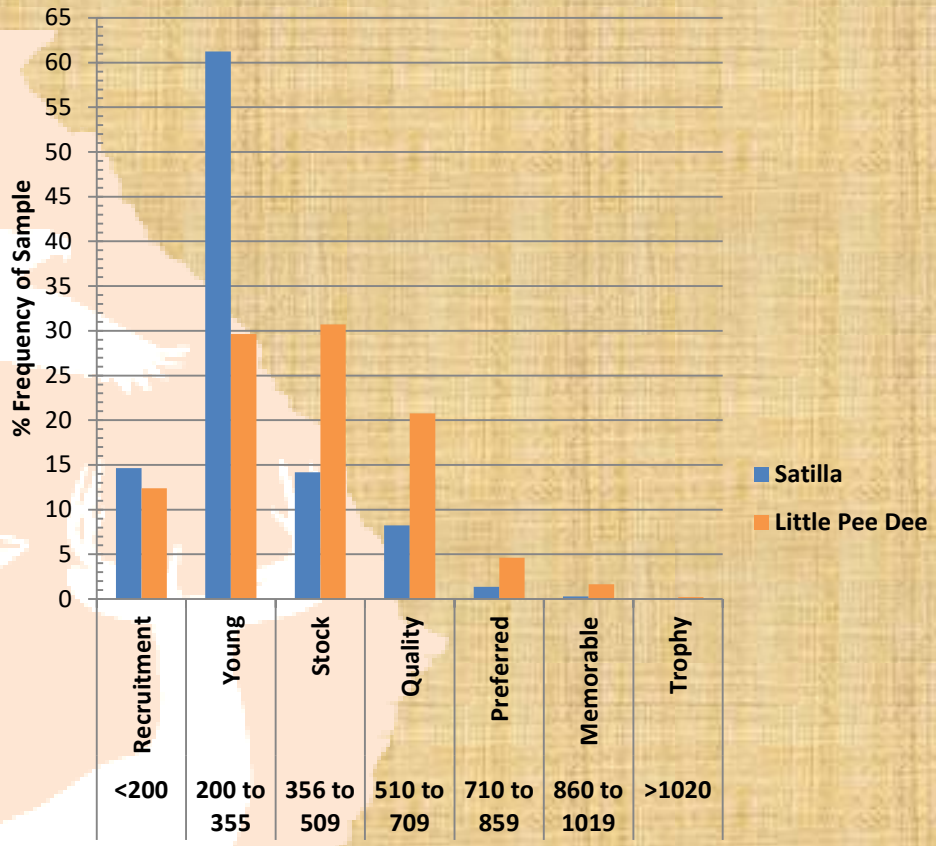


- **Mean ($\underline{W_r}$) of young fish (<355 mm TL) and stock (356-509) size fish was significantly more on the Little Pee Dee than the Satilla River (LSMEANS, t= -8.206 to -4.424, $P < 0.001$)**
- **There was no significant difference between rivers in the mean ($\underline{W_r}$) for Quality, Preferred and Trophy Size fish (LSMEANS, t = -0.0899 to 1.568, P = 0.117 to 0.928)**
- **The Satilla mean ($\underline{W_r}$) of memorable size fish was significantly more than the Little Pee Dee (LSMEANS, t = 2.513, P = 0.012)**

Proportional Stock Densities (PSD)

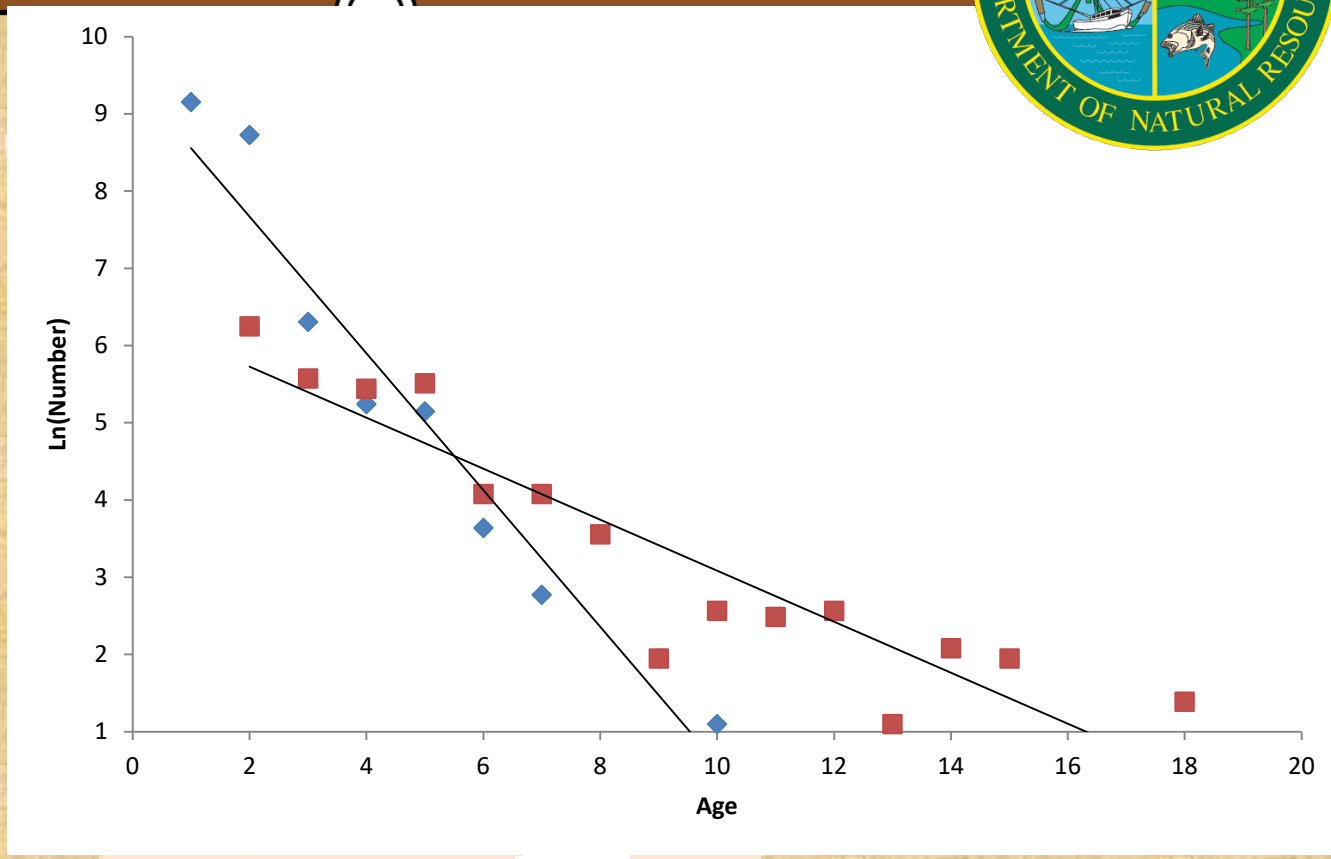
- **Satilla**
- PSD = 41, RSDp= 7, RSDm =2
- 75% of Satilla fish ≤ 355 mm TL
- Only 10% ≥ 510 mm TL

- **Little Pee Dee**
- PSD = 47, RSDp= 11, RSDm =3
- 57% ≥ 355 mm TL
- 27 % ≥ 510 mm TL

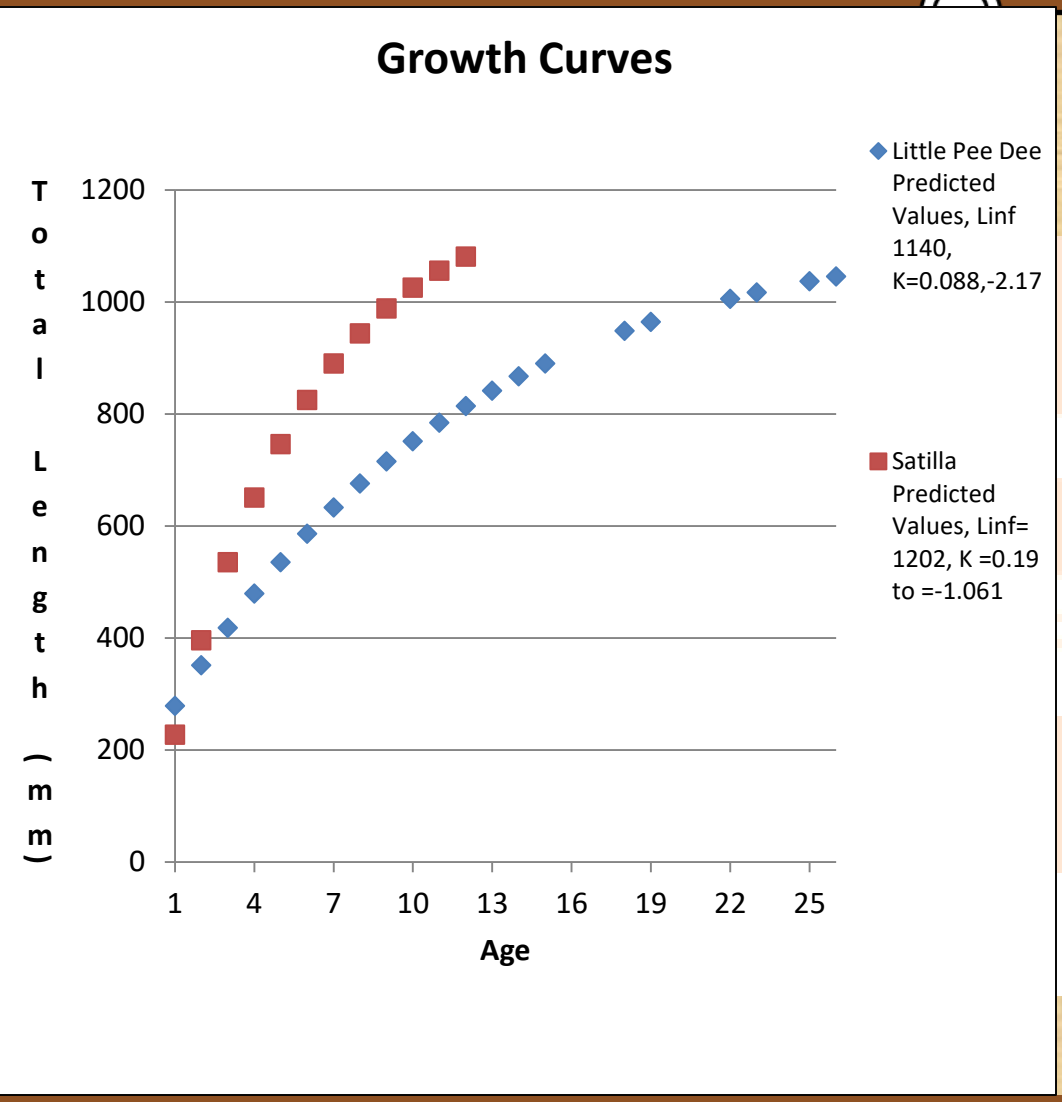


Mortality

- **Satilla**
- Z = -0.9805
- A = 63%
- R2 = 0.95
- Ages 1 to 10, except 8
- Max age 12 obtained
- **Little Pee Dee**
- Z=-0.37488
- A = 31%
- R2 = 0.88
- Ages 1 to 15 & 18
- Max age 26 obtained
- A on other introduced pops were lower-Ocmulgee-20% (Sakaris et al 2006), 16-20% in 3 NC rivers (Kwak et al. 2006).

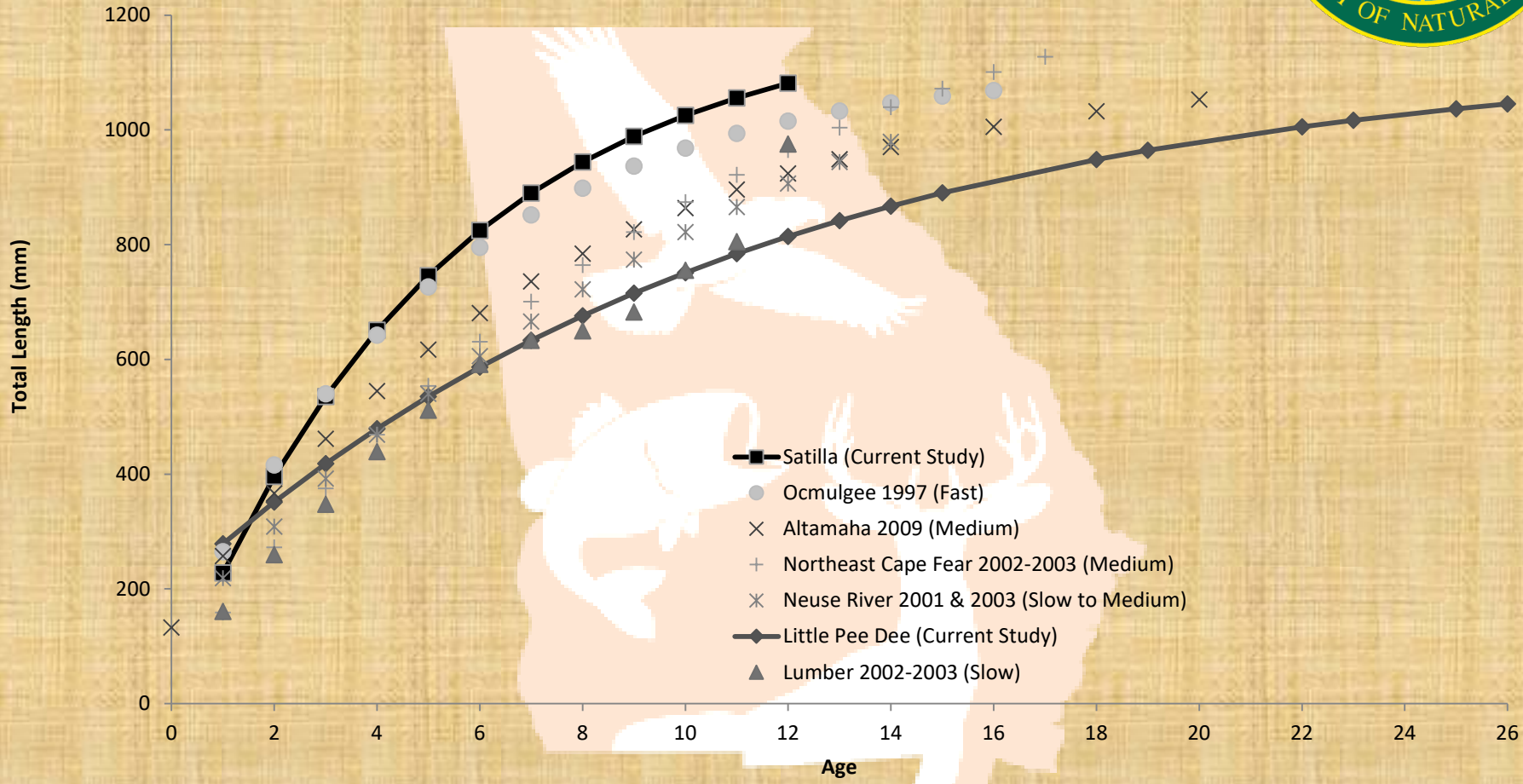


Growth



- **Satilla**
- Around 4.5 yrs to reach preferred size (710 mm)
- Just over 10 yrs to reach trophy size (1020 mm TL)
- Linf= 1202, K = 0.19, to = -1.061
- **Little Pee Dee**
- Just over 9 yrs to reach preferred size (710 mm TL)
- Over 23 yrs to reach trophy size (1020 mm TL)
- Linf= 1140, K = 0.088, to = -2.17

Growth


Total Length (mm)
1200
1000
800
600
400
200
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Age
Satilla (Current Study)
Ocmulgee 1997 (Fast)
Altamaha 2009 (Medium)
Northeast Cape Fear 2002-2003 (Medium)
Neuse River 2001 & 2003 (Slow to Medium)
Little Pee Dee (Current Study)
Lumber 2002-2003 (Slow)

Conclusions

Satilla

- High relative abundance (CPE = 75 fish/hr)
- High Annual mortality (A = 63%)
- Fast growth (k = 0.19)
- Truncated size and age structure containing mostly smaller (75% of sample ≤ 356 mm TL) and younger fish
- Max age =12

Little Pee Dee

- High relative abundance (CPE = 89 fish/hr)
- Low Annual Mortality (31%)
- Slow growth (k= 0.088)
- Balanced size and age structure
- 57% of sample > 356 mm TL
- Max age = 26

Conclusions

- This study expands our knowledge base on introduced flathead catfish population dynamics along the coastal plain and provides a few options of how state agencies in the Southeast have managed a very challenging issue in regard to managing an introduced apex predator.

Acknowledgments

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