



8:45 AM – 9:35 AM

Research Update

Distribution and Habitat Associations

Philip Stevens, Research Scientist, FWRI

Spawning Dynamics

Joy Young, Biological Scientist, FWRI

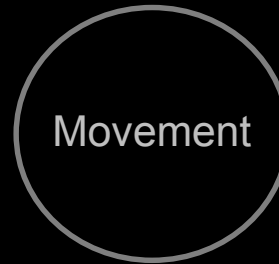


Research - Population/Behavioral traits

What is it that Snook do and why do they do it?



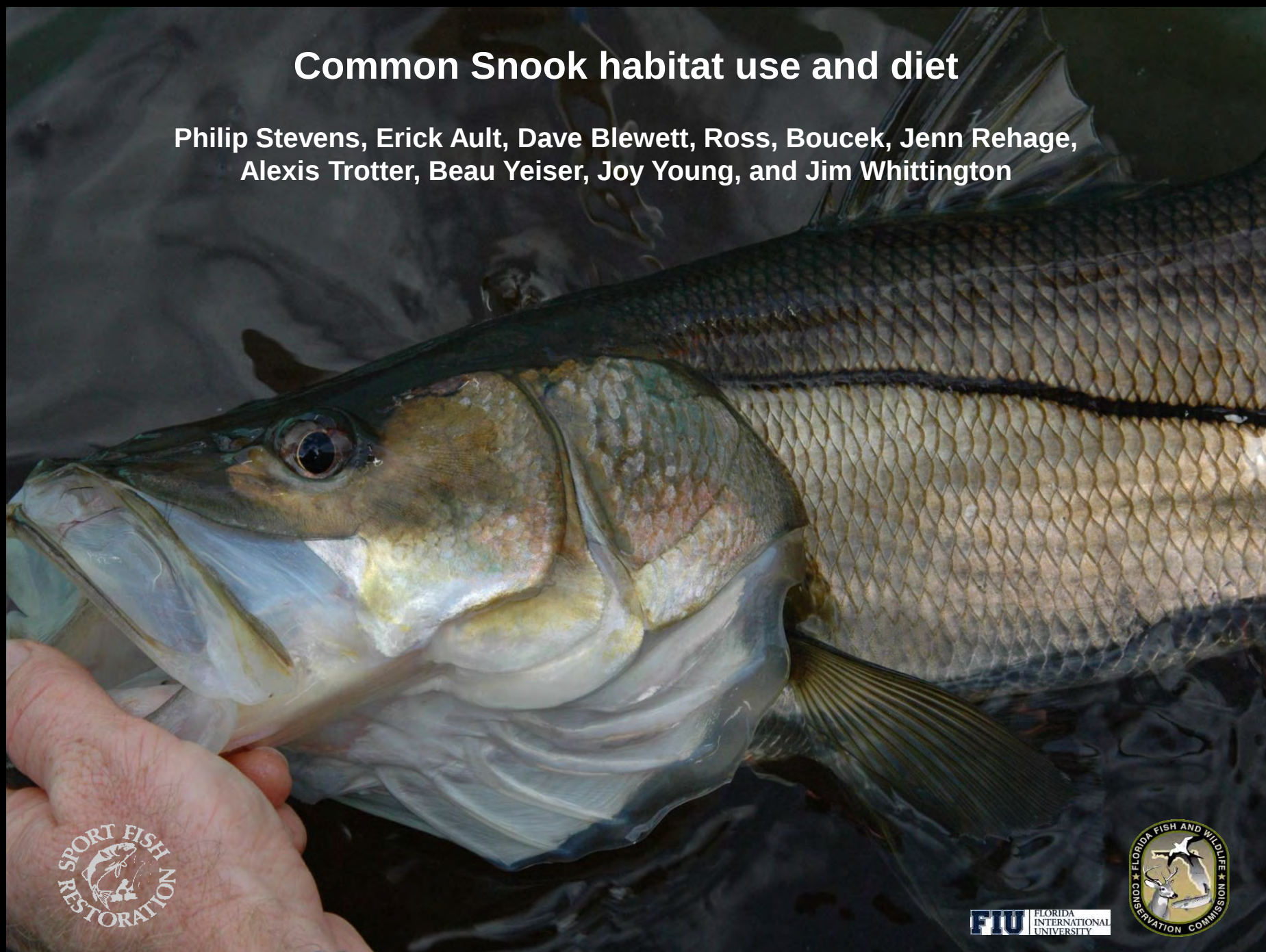
Phil Stevens



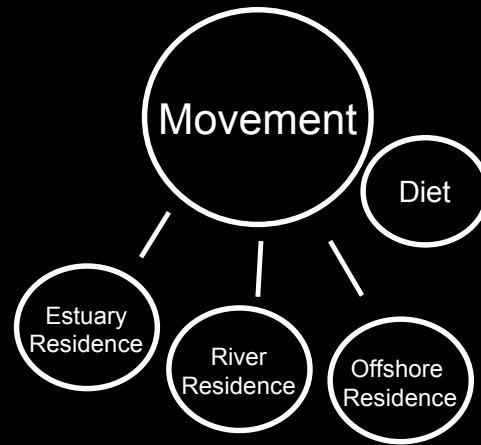
Joy Young

Common Snook habitat use and diet

Philip Stevens, Erick Ault, Dave Blewett, Ross, Boucek, Jenn Rehage,
Alexis Trotter, Beau Yeiser, Joy Young, and Jim Whittington



Habitat use and diet



Data for Stock Assessment are largely centered on the estuary

What is going on in other habitats, namely offshore reefs and rivers?

To what extent do fish move between habitats and why do they move?

Offshore Reefs



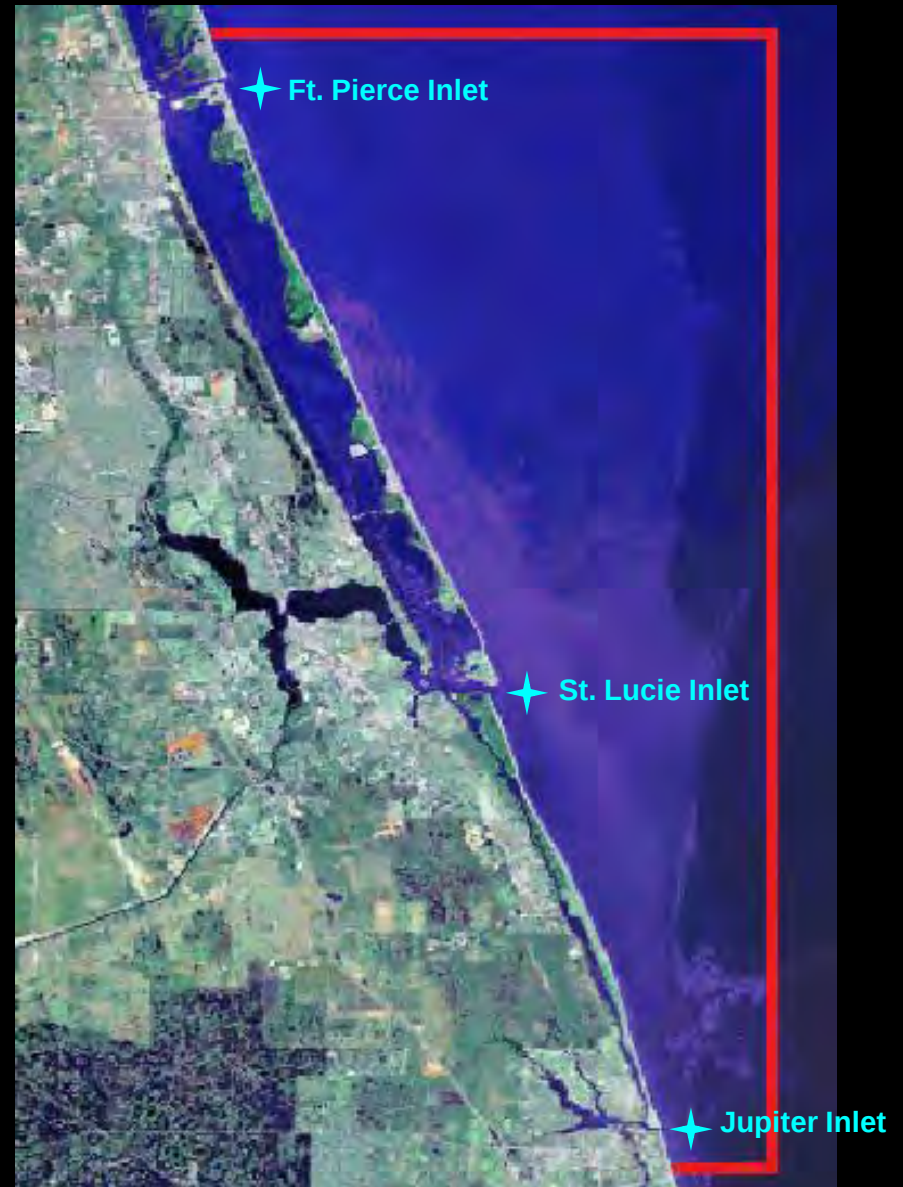


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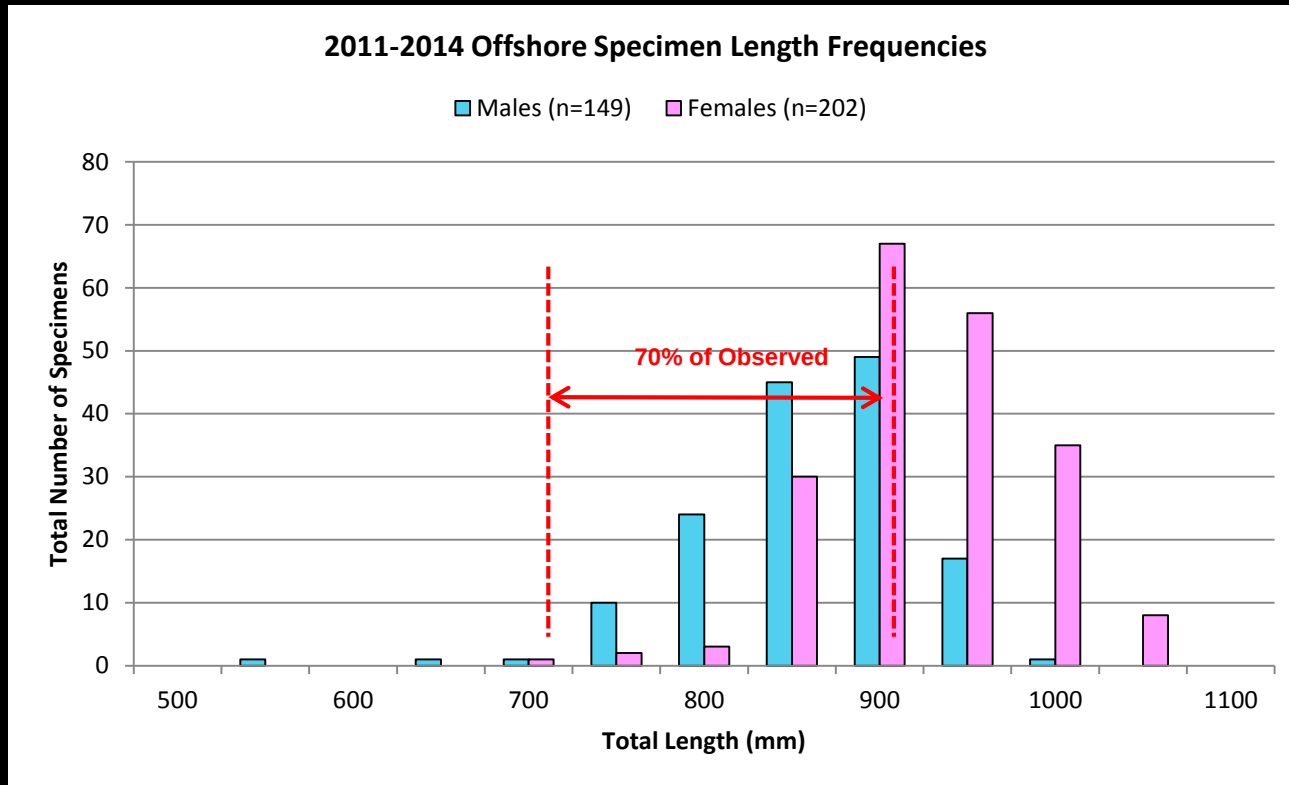
Study Sampling Area



- 65 Km (40 Miles) Coastline
- About 5-12 km (3-8 miles) offshore



Offshore Life History



Average TL = 949 mm (37 inches) for females and 885 mm (35 inches) for males

Maximum TL = 1093 mm (43 inches)

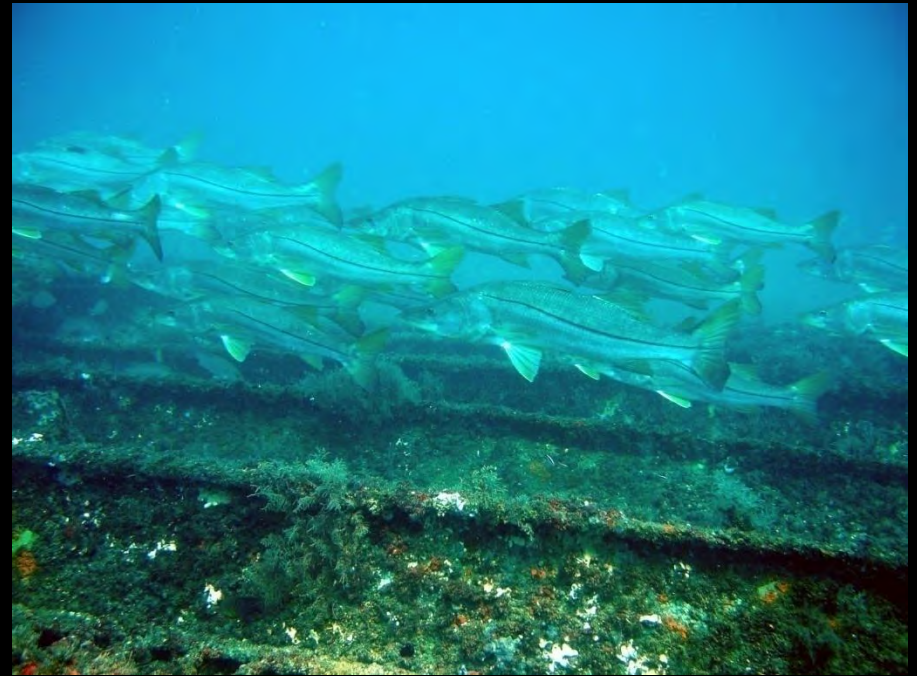
Age range = 4 -19 years; average ~10 years

Diet and genetics

Offshore Life History Cont.

Underwater Observations

- Roving Count (Opportunistic)
- Group Size (Number of Fish)
- Length Distribution (TL)
- Regional Bias
- **Condition Limited**



2009 - 2014 Observation Data

Region	Group (Average)	Group (Maximum)	TL (mm) Avg	TL (mm) Max
Ft. Pierce	24	140	835	1150
St. Lucie	29	250	827	1150
Jupiter	18	50	759	1080

Offshore Movement Patterns

Acoustic Telemetry

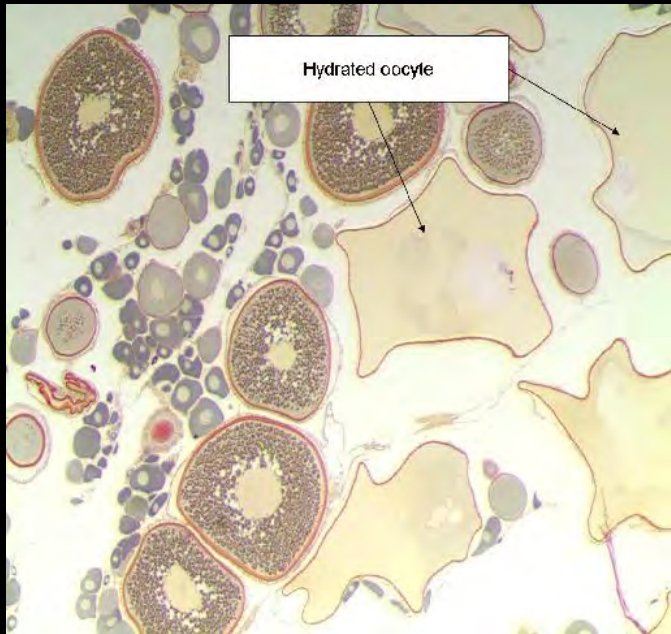
Of snook originally tagged inshore (n=186), eleven moved offshore

Snook that were tagged offshore (n=61), mostly remained offshore (high residency to reef tract)

Once offshore, very little movement back to inlets and inshore waters (only 4 fish bounced back and forth)

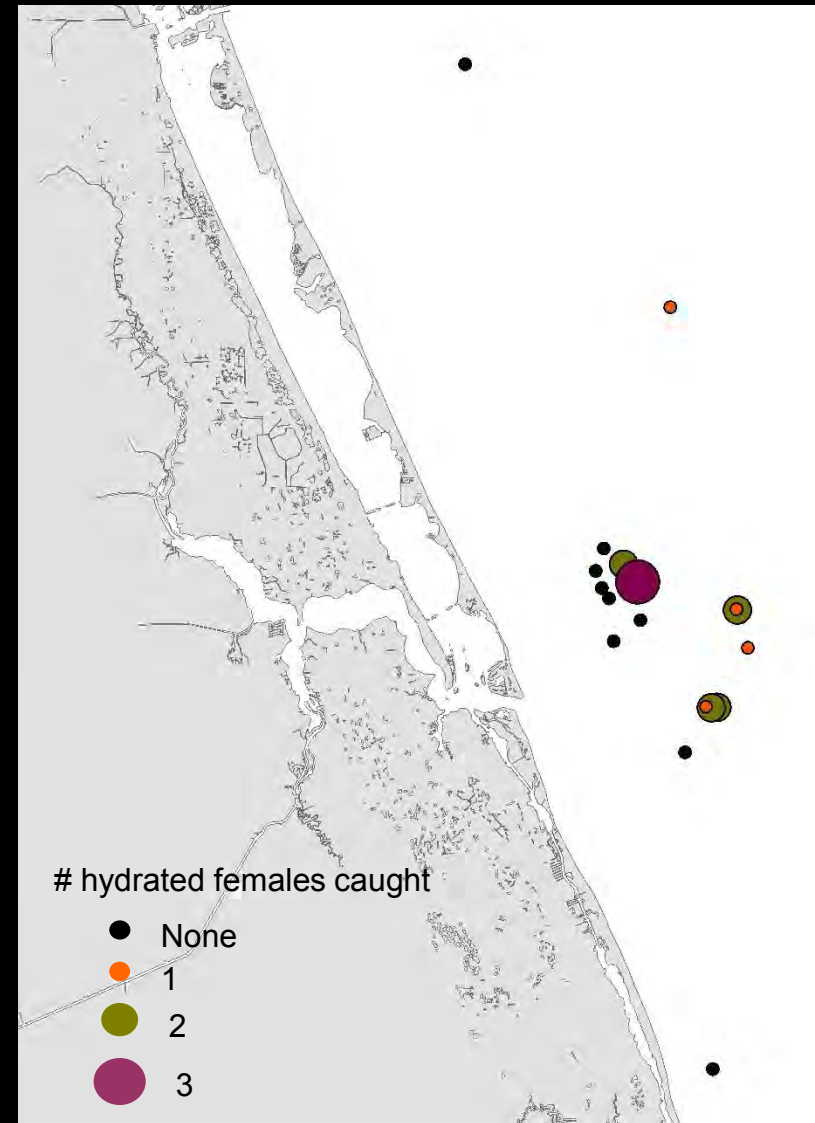


Offshore Reproduction



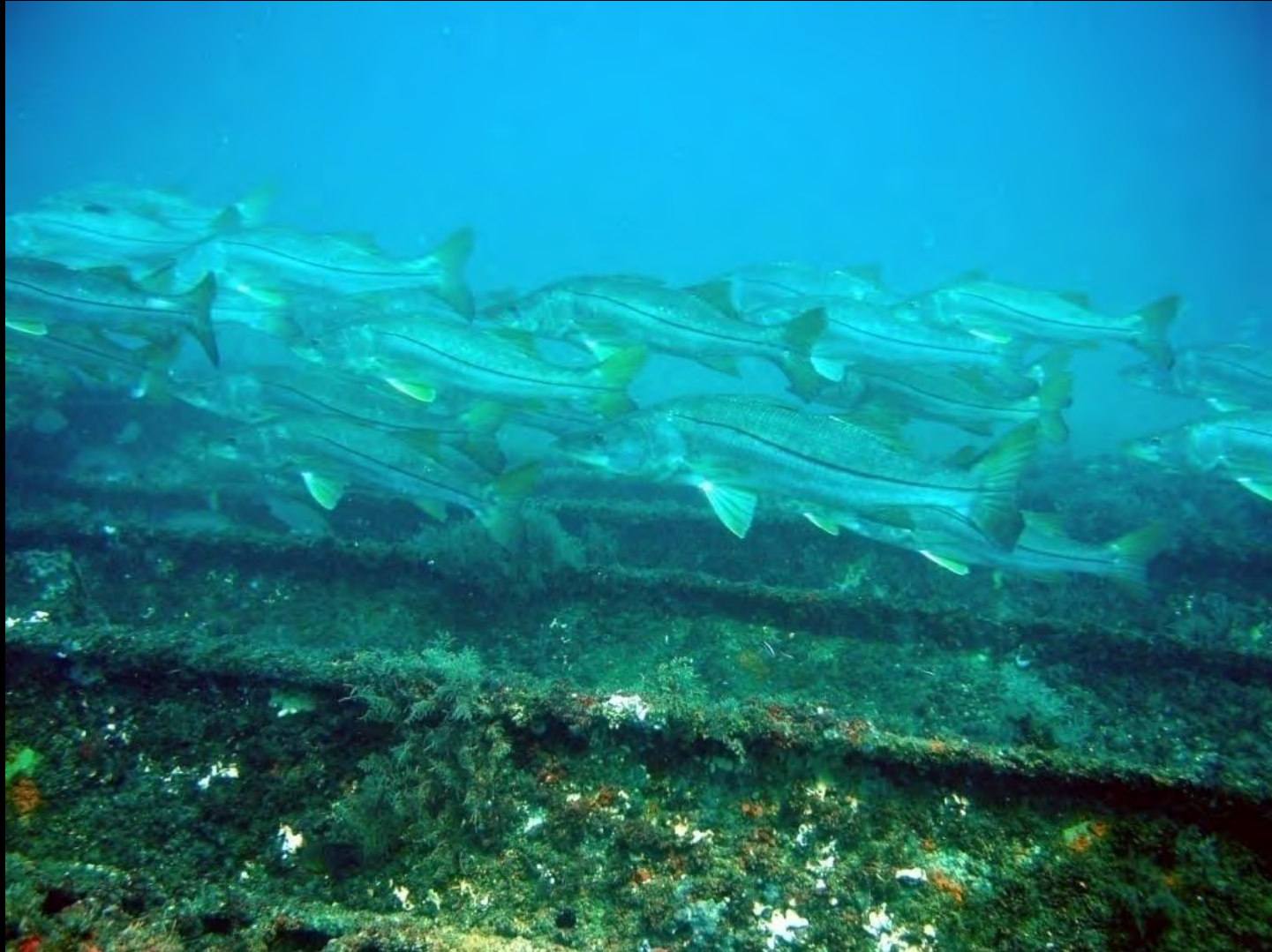
- Sampling occurred in evening hours when active spawning is known to occur
- 99% of females were spawning capable or regressing
- 11% of females had hydrated eggs (Imminent spawning)

Sampling and hydrated female locations





Use of offshore habitat has been documented throughout the state. Are these areas important at the population scale?



Rivers







Spring-fed
rivers

Tampa Bay

Charlotte
Harbor

Everglades

SE Florida

Acknowledgements

Luiz Barbieri, Jim Estes, Tom Champeau, Bill Johnson, Bill Pouder, and Ron Taylor



Southwest Florida Water Management District;
State Wildlife Grant; Sport Fish Restoration

FWC St Pete, Charlotte Harbor, Lakeland,
Gainesville, Melbourne, Everglades (FIU)

How do we sample rivers? - electrofishing



Stuns the fish – Allows researchers to take measurements and release





Charlotte
Harbor

Electrofishing 2004-05

Myakka River

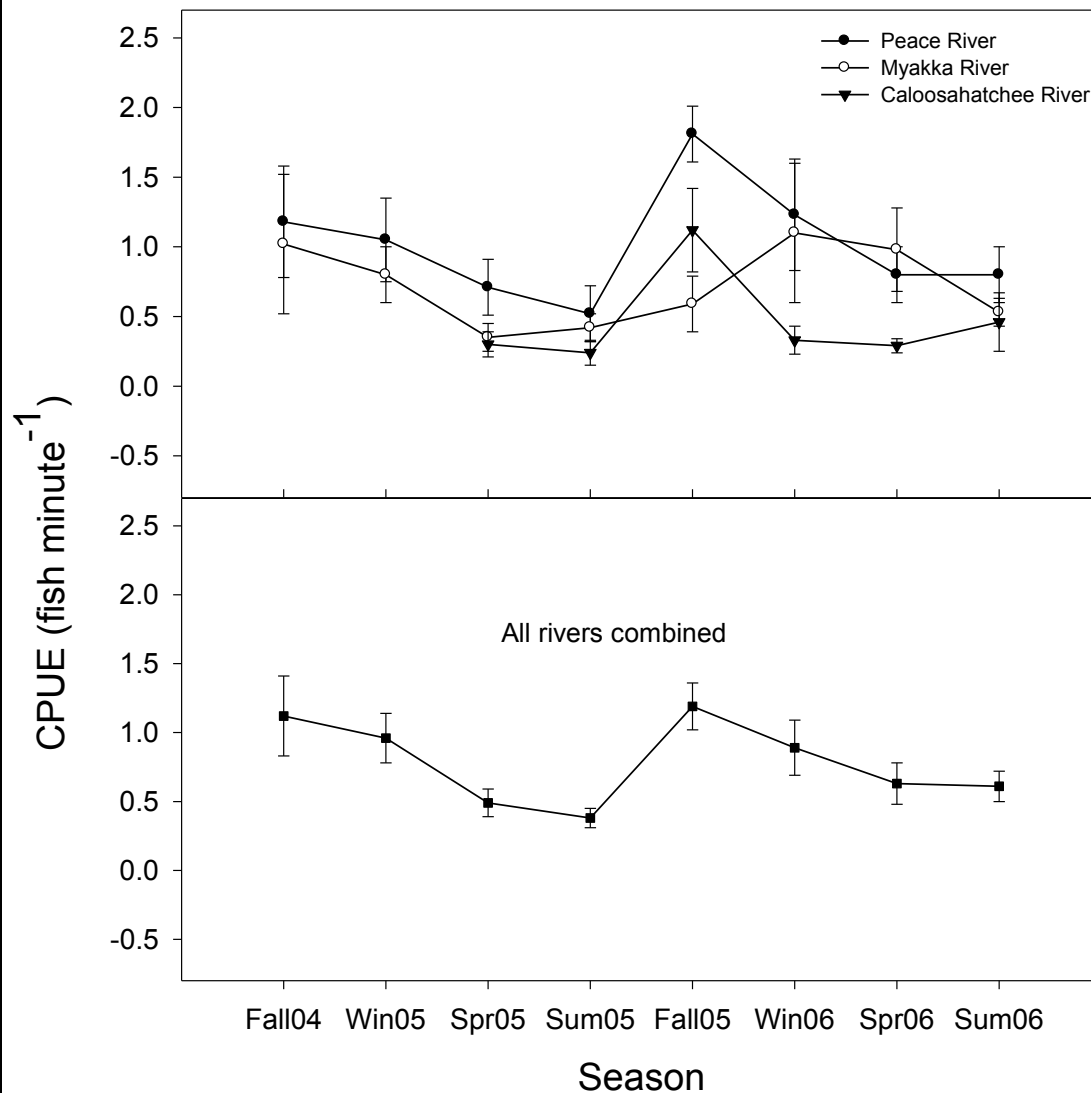
Peace River

Caloosahatchee River



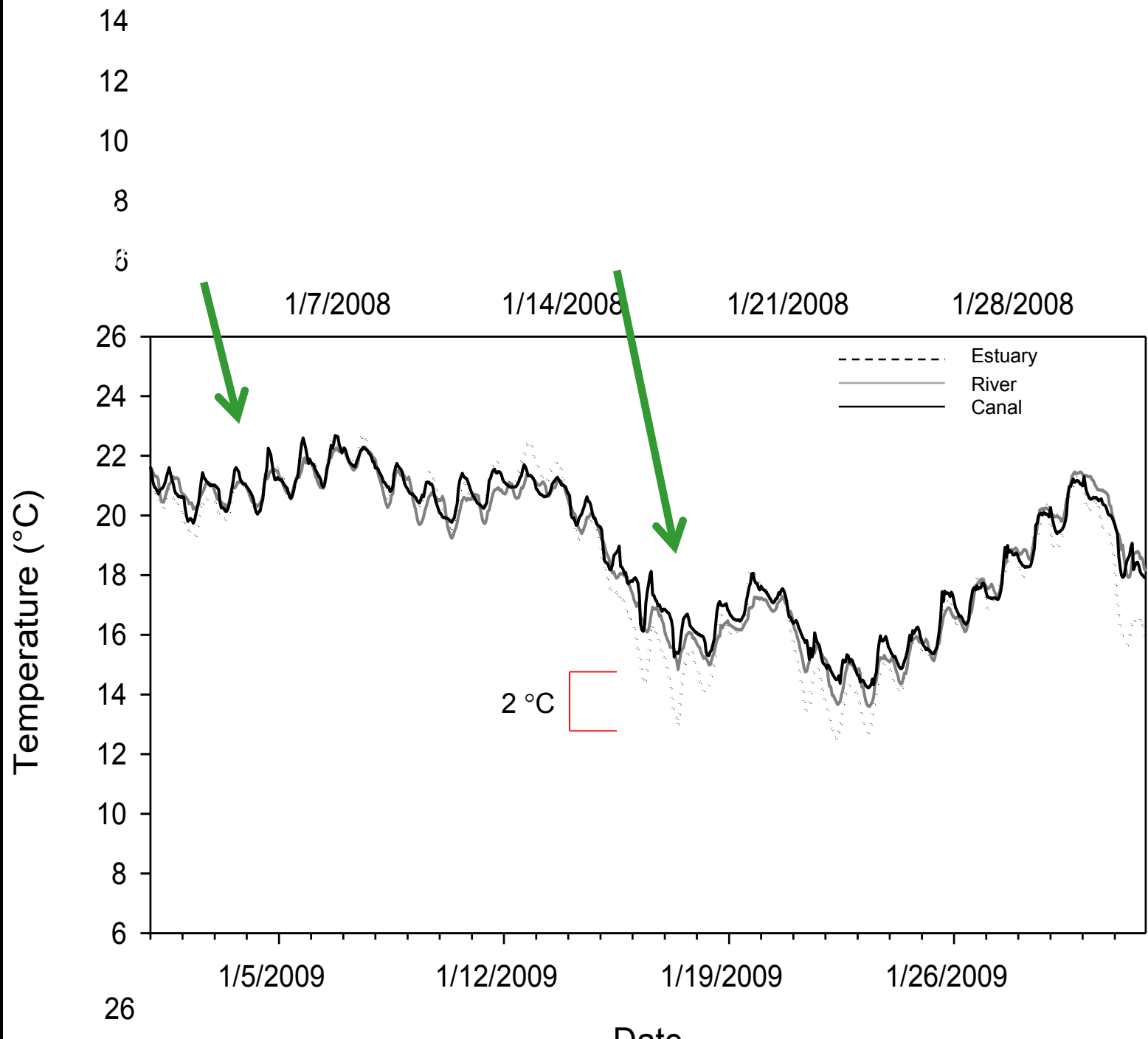
Freshwater Fisheries

Charlotte Harbor Rivers - Seasonality



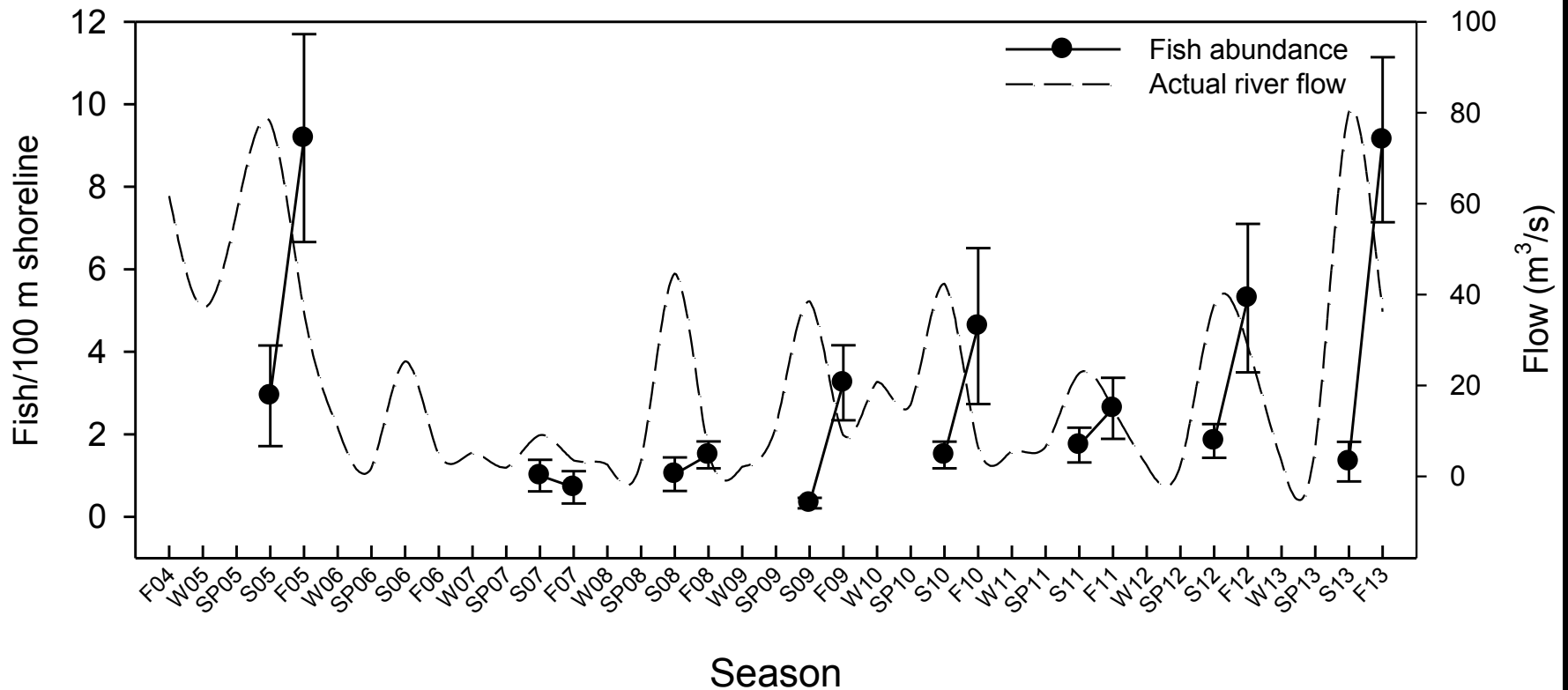
What drives seasonal movements of snook into the rivers?





Appear to cue on river flow

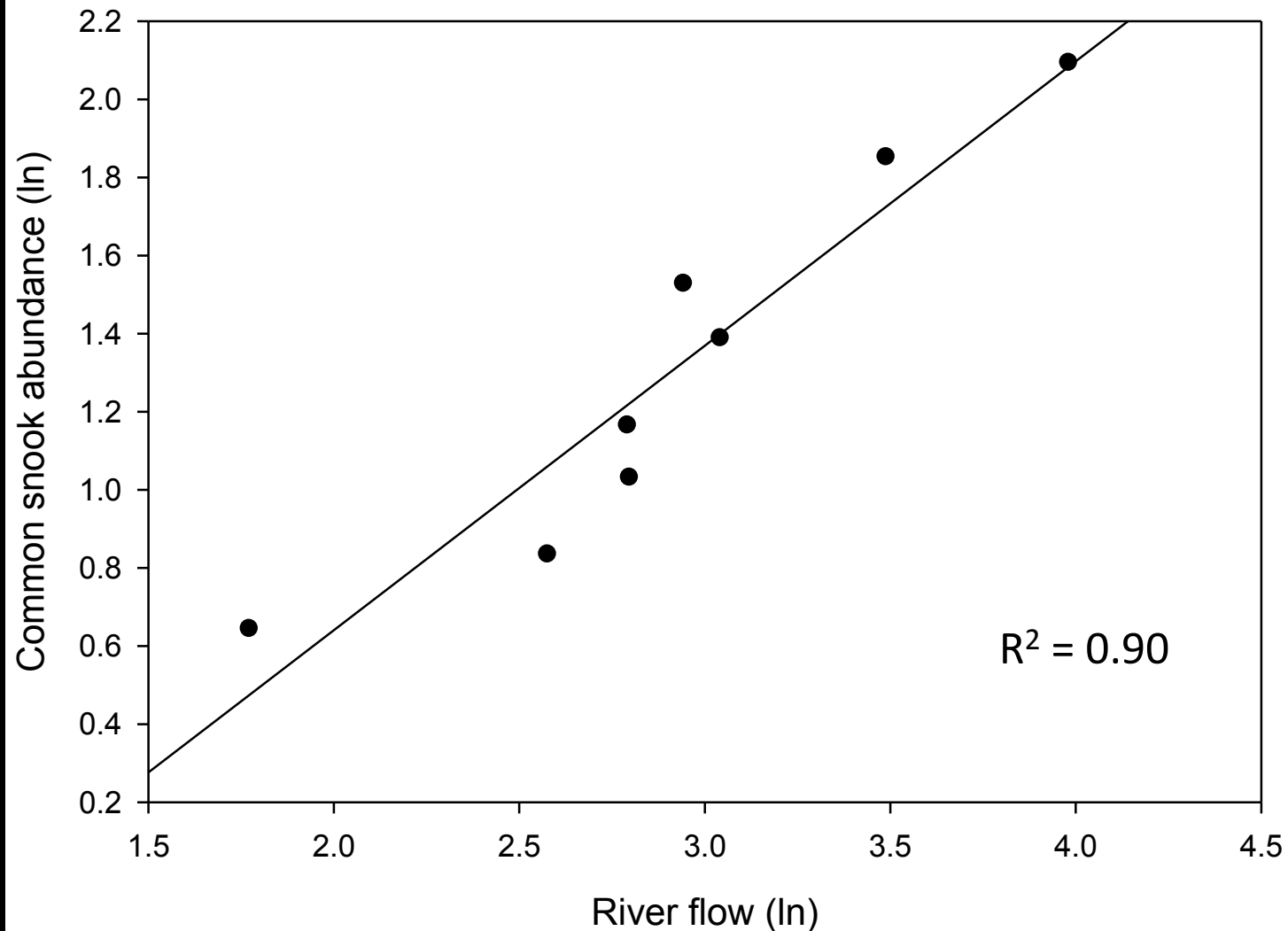
Summer/fall abundance of snook



Estuary = 3 fish per haul in 183-m seine * gear efficiency of 30% = 10 snook/100m shoreline

Rivers (summer) = ~1.5 fish per 100m in electrofishing * gear efficiency of 15% = 10 snook/100m shoreline

Annual snook abundance vs. flow



More Flow = More Snook



Peace River – summer

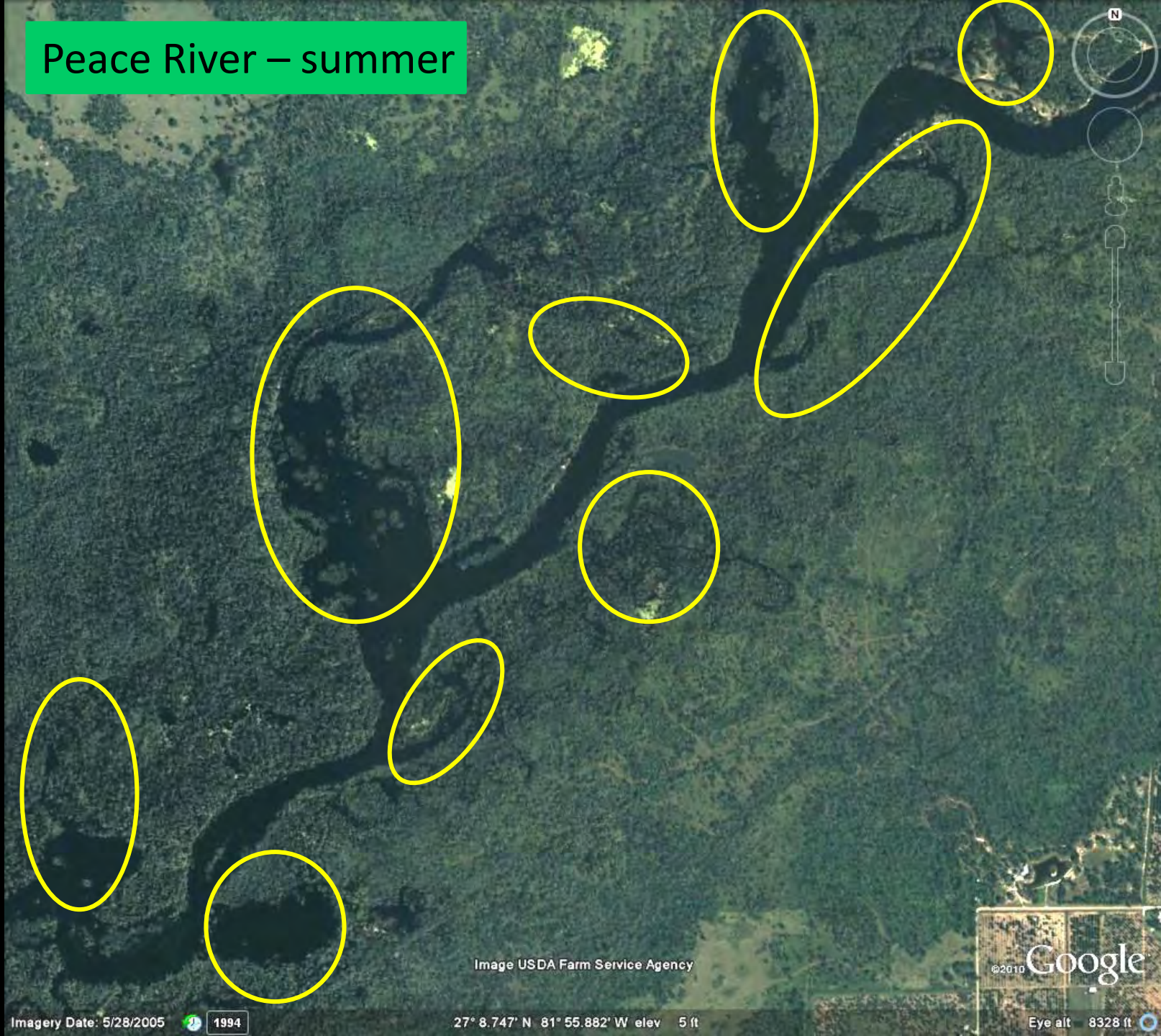


Image USDA Farm Service Agency

Imagery Date: 5/28/2005

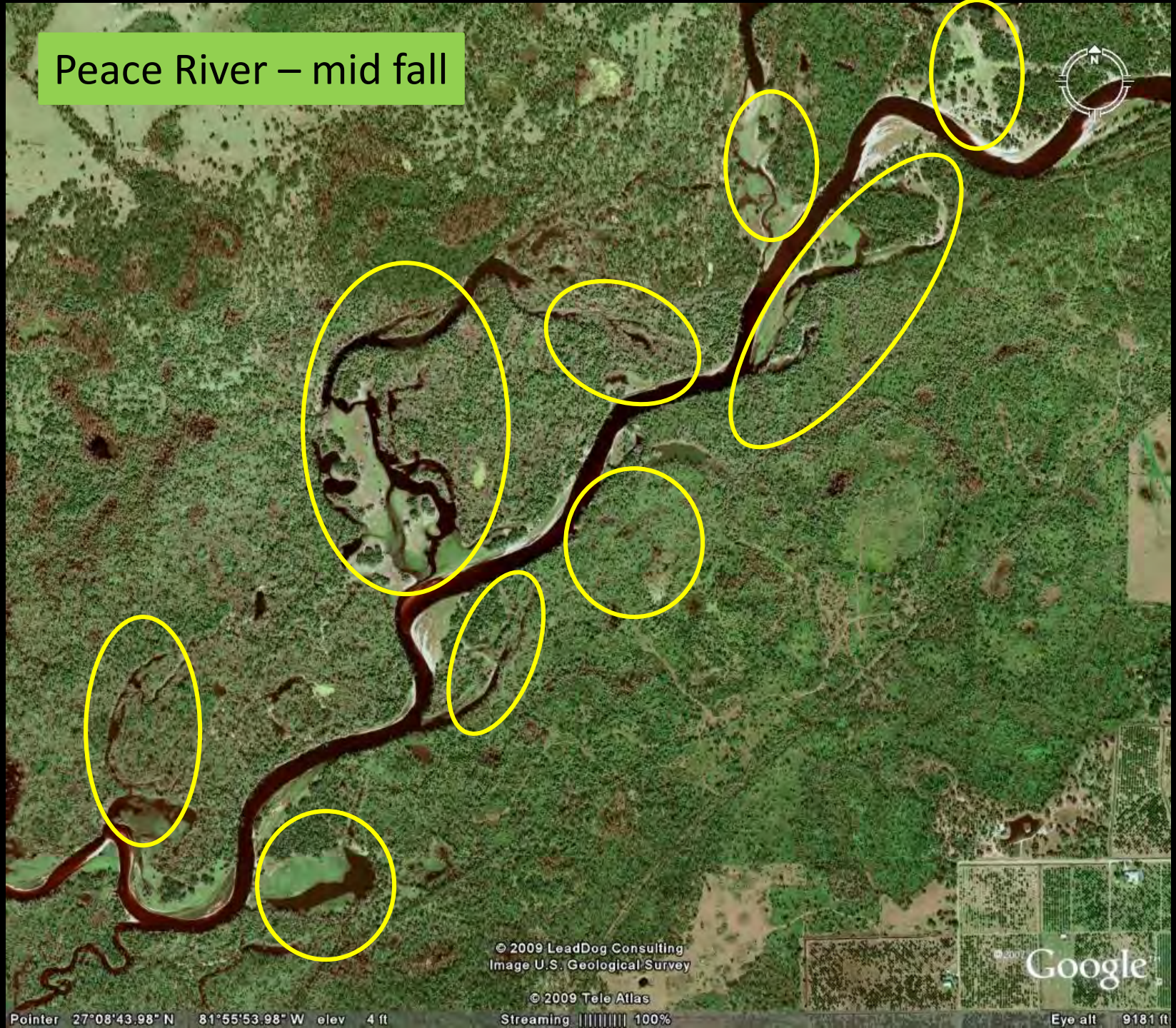
1994

27° 8.747' N 81° 55.882' W elev 5 ft

©2010 Google

Eye alt 8328 ft

Peace River – mid fall



© 2009 LeadDog Consulting
Image U.S. Geological Survey

© 2009 Tele Atlas

Pointer 27°08'43.98" N 81°55'53.98" W elev 4 ft

Streaming 100%

Google

Eye alt 9181 ft

Estuary Prey



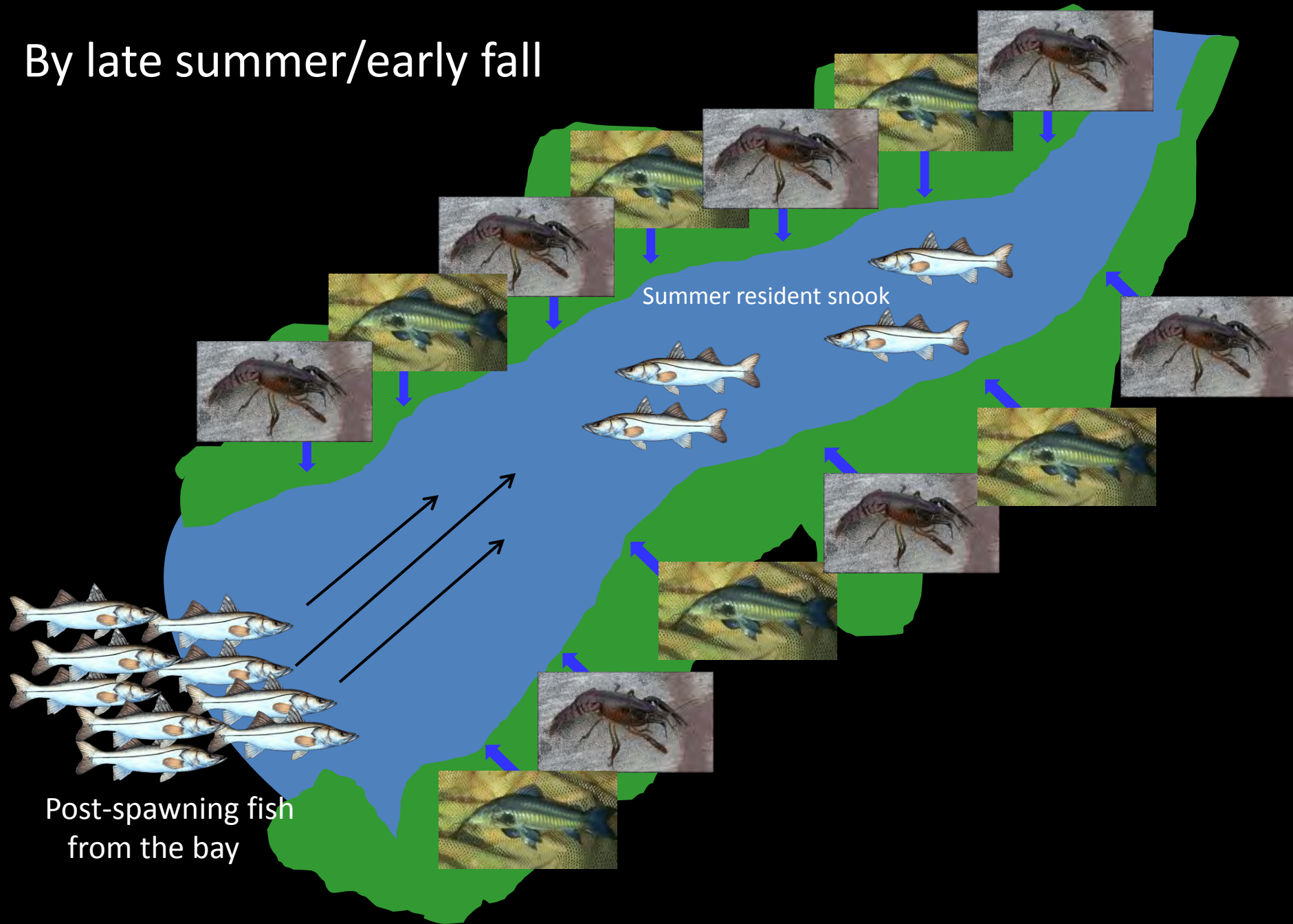
Blewett et al. 2006

River Prey



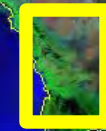
Stevens et al. 2010

By late summer/early fall



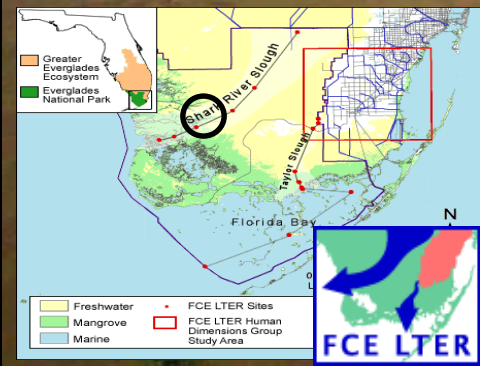
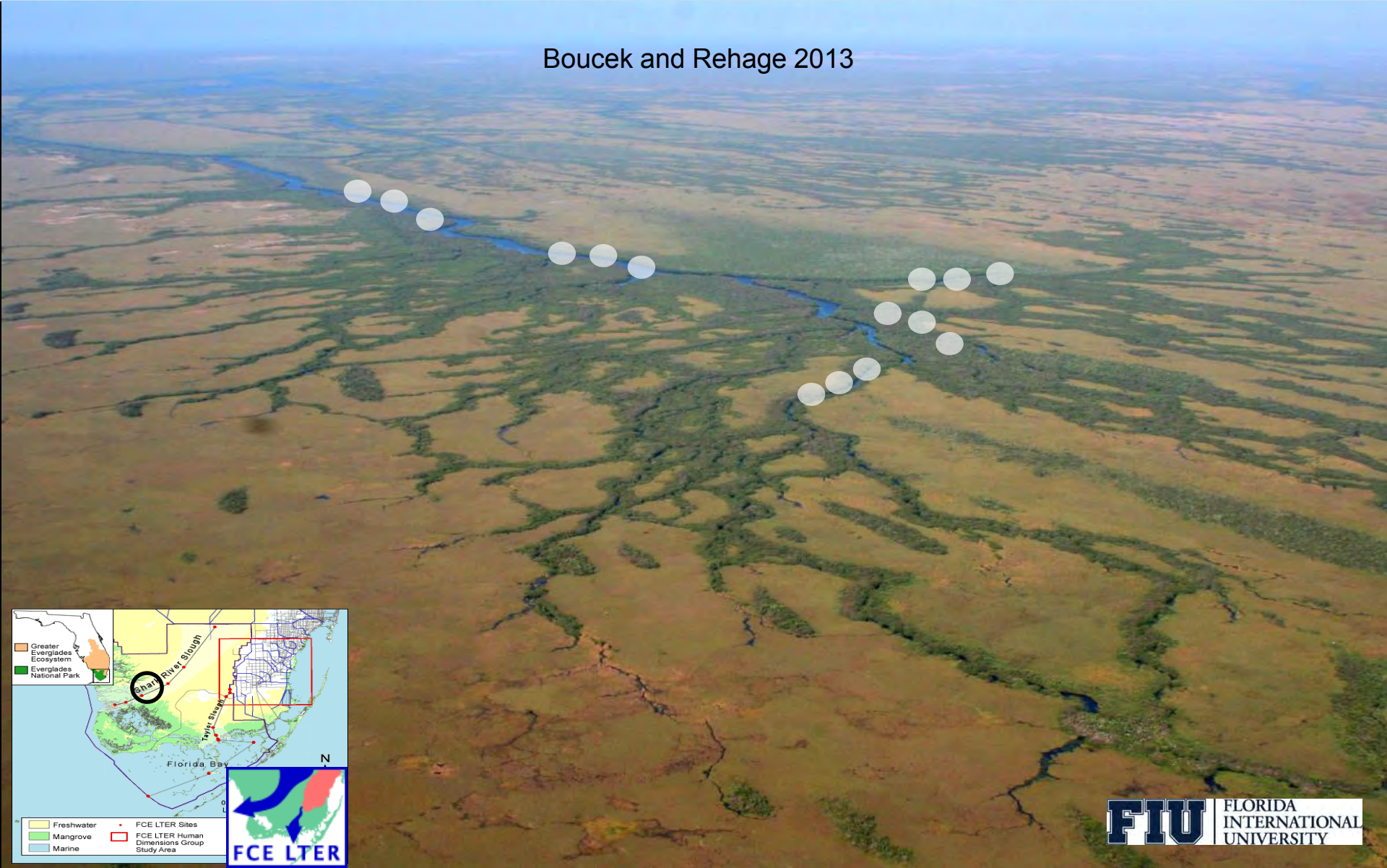


Everglades

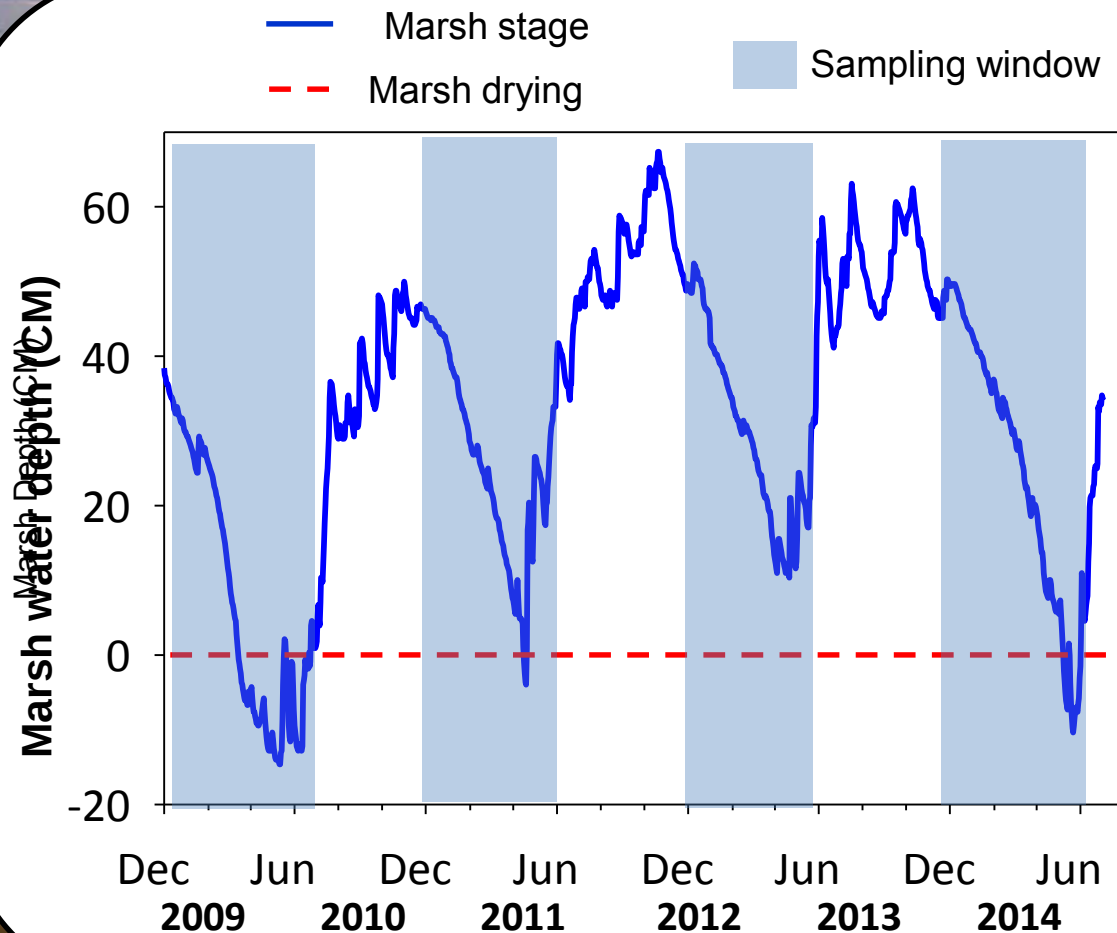


Study system: ecotonal sites in Everglades National Park

Boucek and Rehage 2013



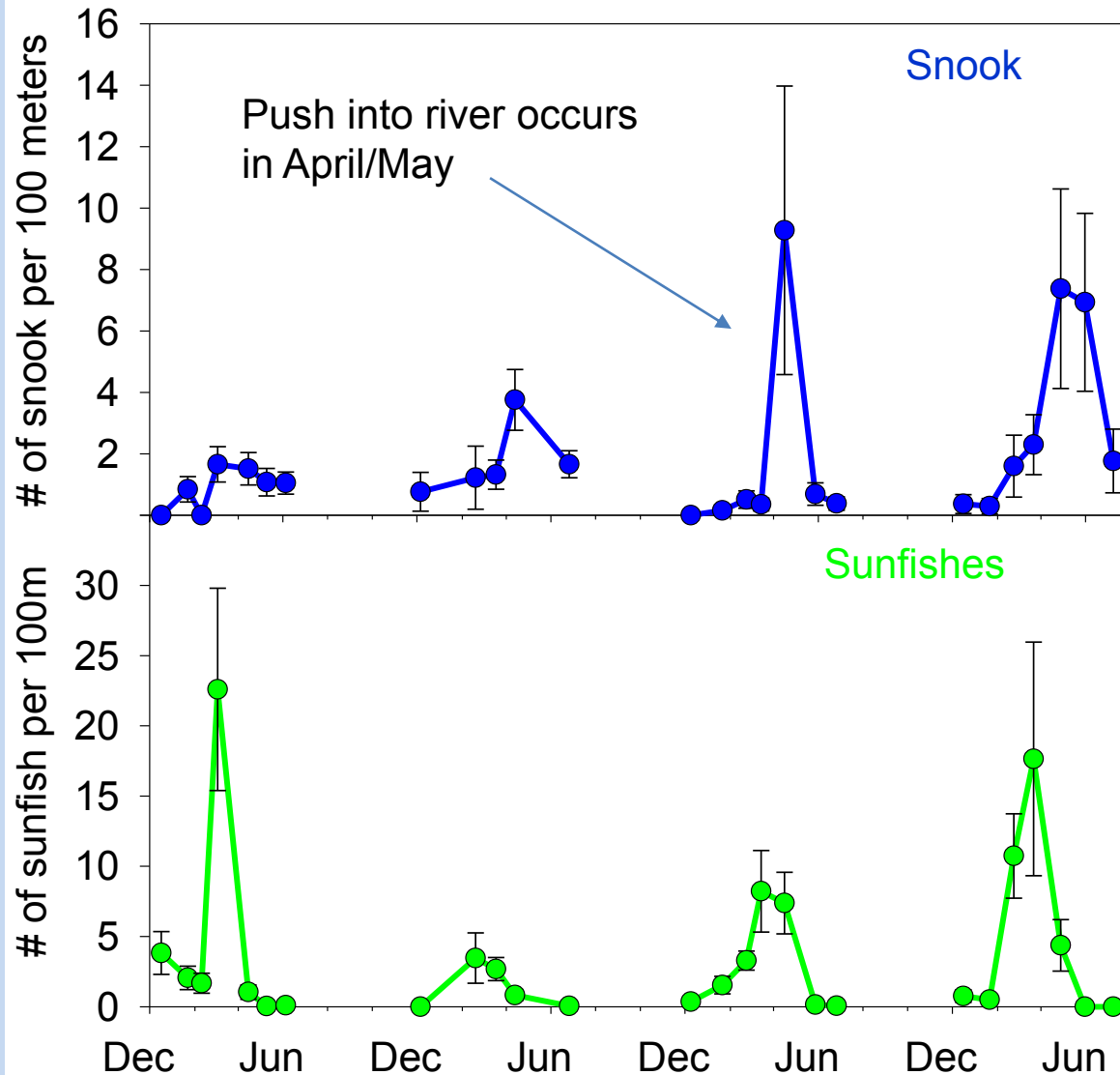
Study system: ecotonal sites in Everglades National Park



Sunfishes are the dominant prey items



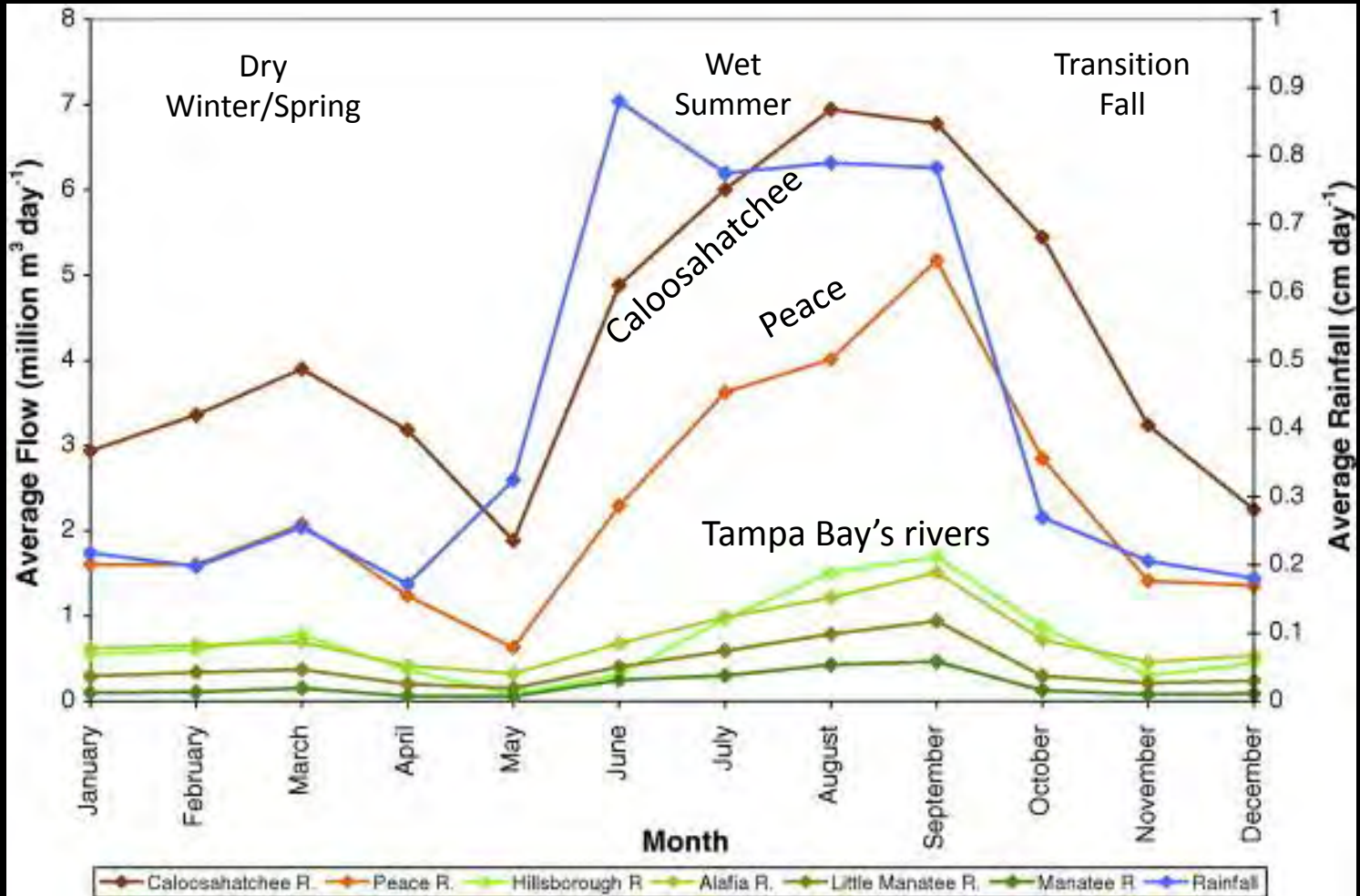
Snook and sunfish abundance increases in the dry season, but varies across years





Tampa Bay

Southwest Florida Rivers





Tampa Bay Rivers

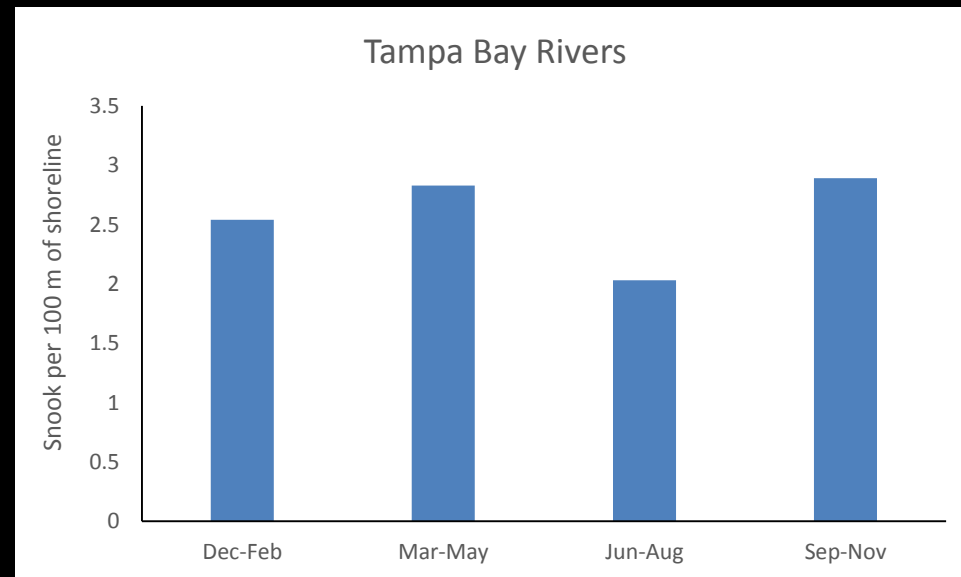


Year-round occurrence; no seasonal changes apparent.

The rivers in TB appear to be an extension of the estuary habitat

There are about 15 snook per 100m of shoreline (the length of a football field) in both estuary and river habitats

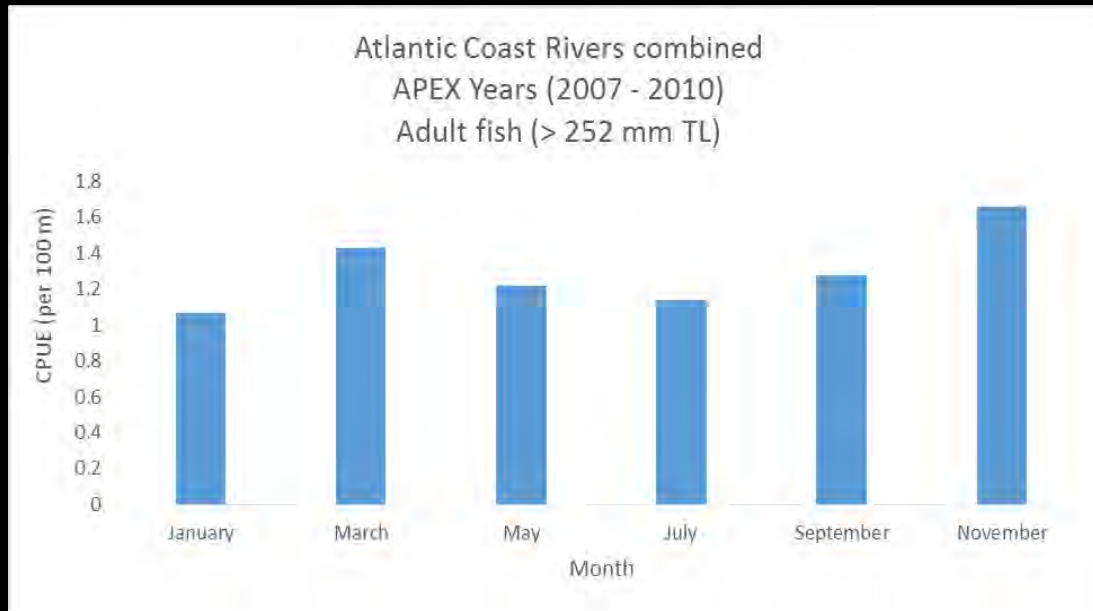
Estuary = 5 fish per haul in 183-m seine * gear efficiency of 30%
Rivers = 2.6 fish per 100m shoreline in electrofishing * gear efficiency of 15%





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Indian River Lagoon Rivers



Year-round occurrence; no seasonal changes apparent.

The rivers in IRL appear to be an extension of the estuary habitat

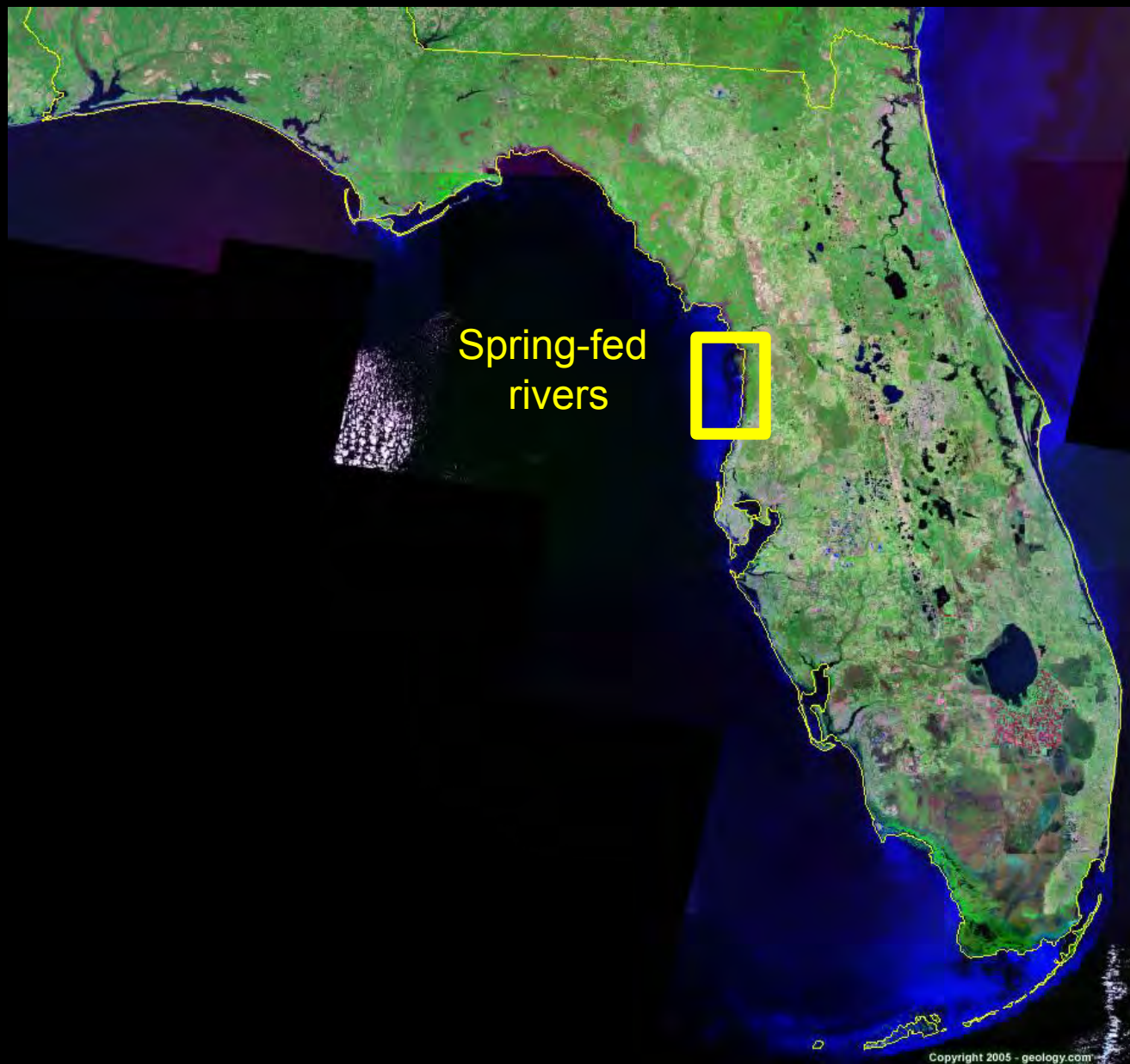
There are about 15 snook per 100m of shoreline (the length of a football field) in the estuary and 9 snook per 100m in the rivers.

However, other snook species (e.g., fat snook) boost numbers of “snook” per 100m of shoreline to that comparable to the estuary.

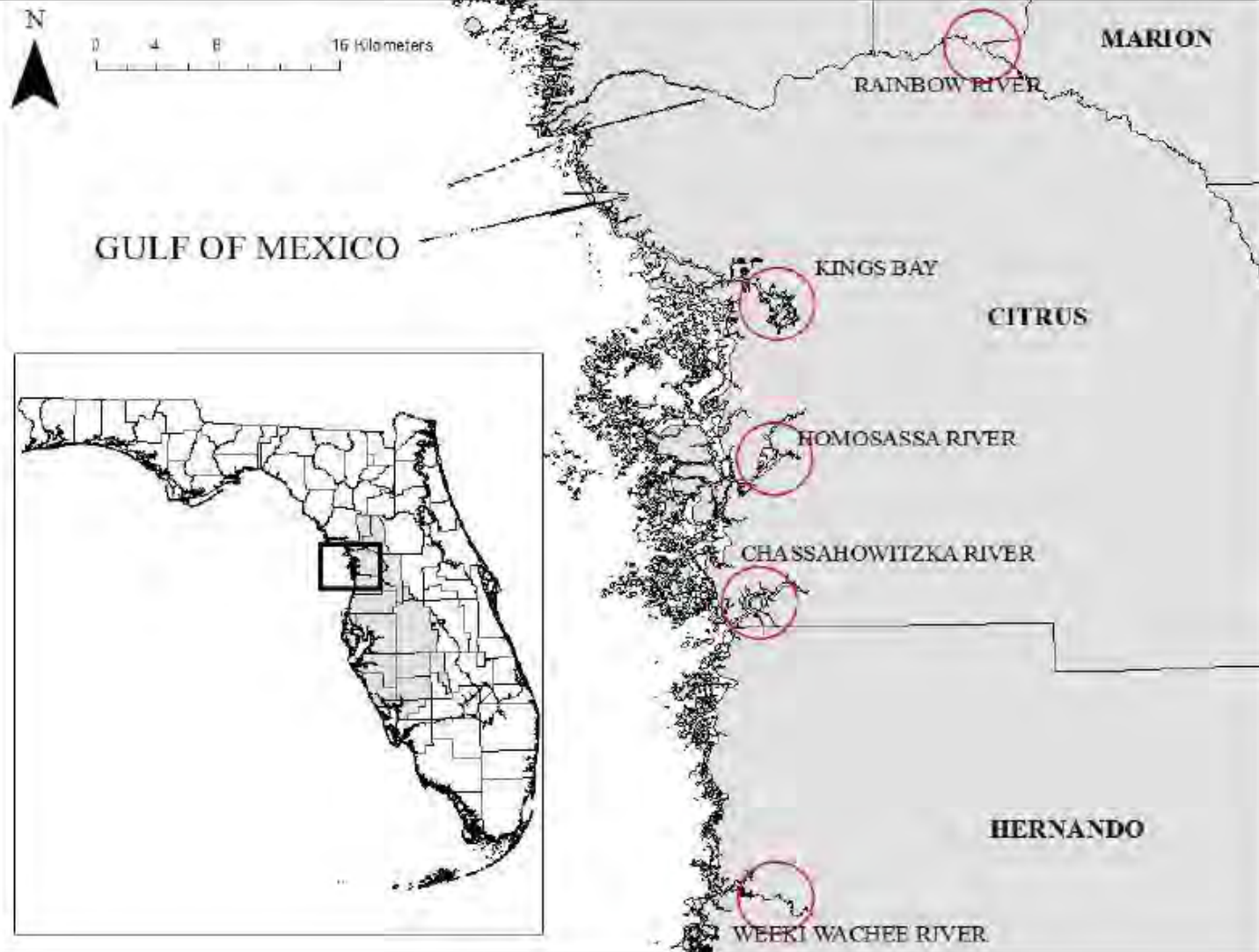
Estuary = 5 fish per haul in 183-m seine * gear efficiency of 30%

Rivers = 1.3 fish per 100m shoreline in electrofishing * gear efficiency of 15%





Spring-fed
rivers

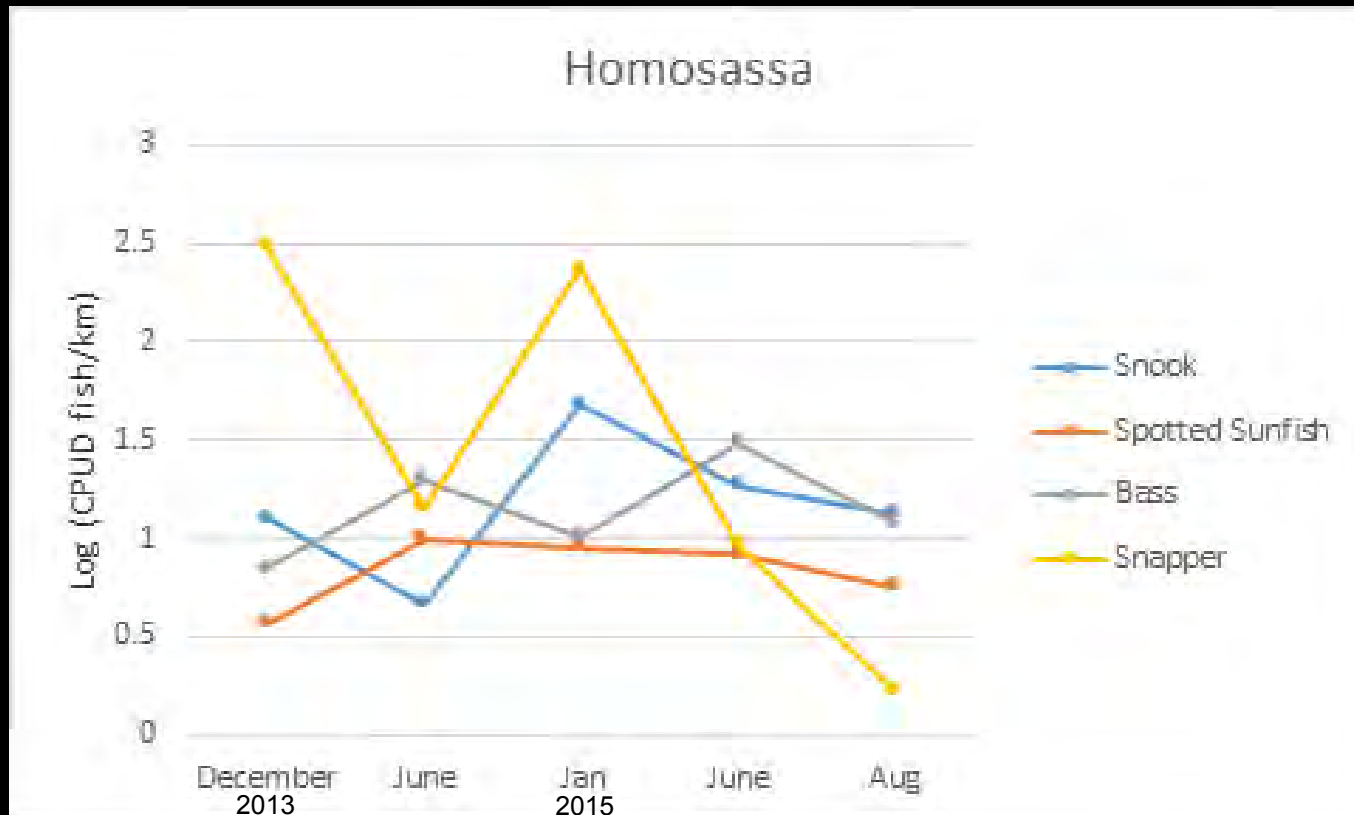


Overwintering is apparent at this latitude

(Picture from observation bubble at Homosassa Springs)

<50 deg F Gulf temp vs. 72 deg F spring temp



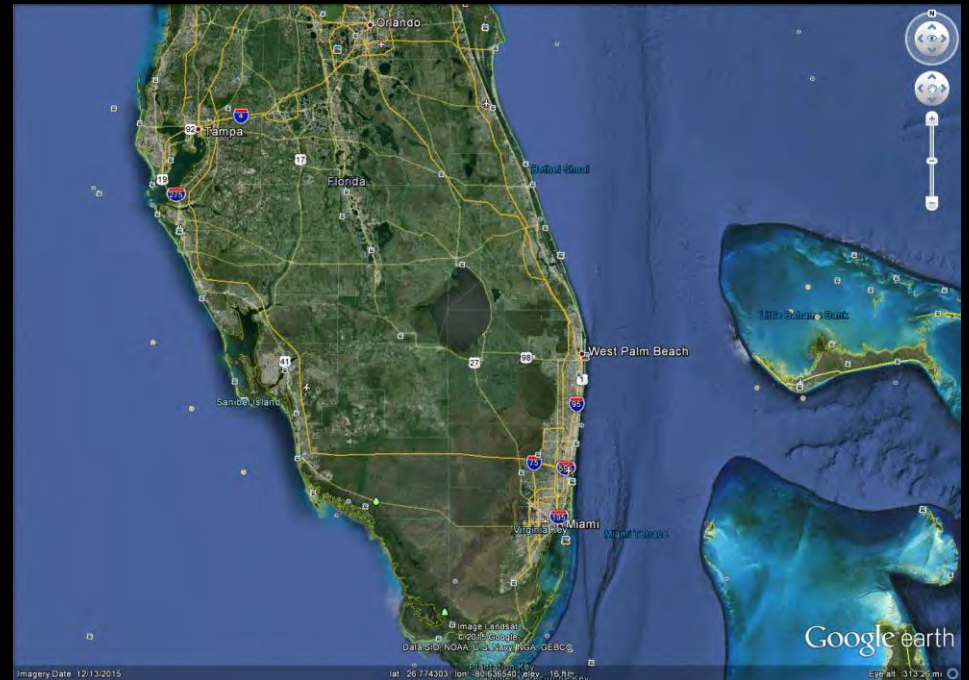
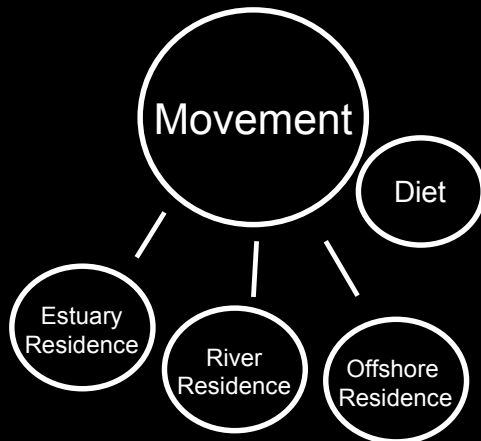


Abundance in rivers less than half that of lower latitudes

$0.2-0.6 \text{ snook}/100\text{m} \times \text{gear efficiency of } 15\% = <4 \text{ snook}/100\text{m}$

Conclusions

Population traits will vary based on the size and shape of the estuary, habitat types, and prey presented to the species



Thank you!

