Inshore Cobia in South Carolina

DNR

What We Know

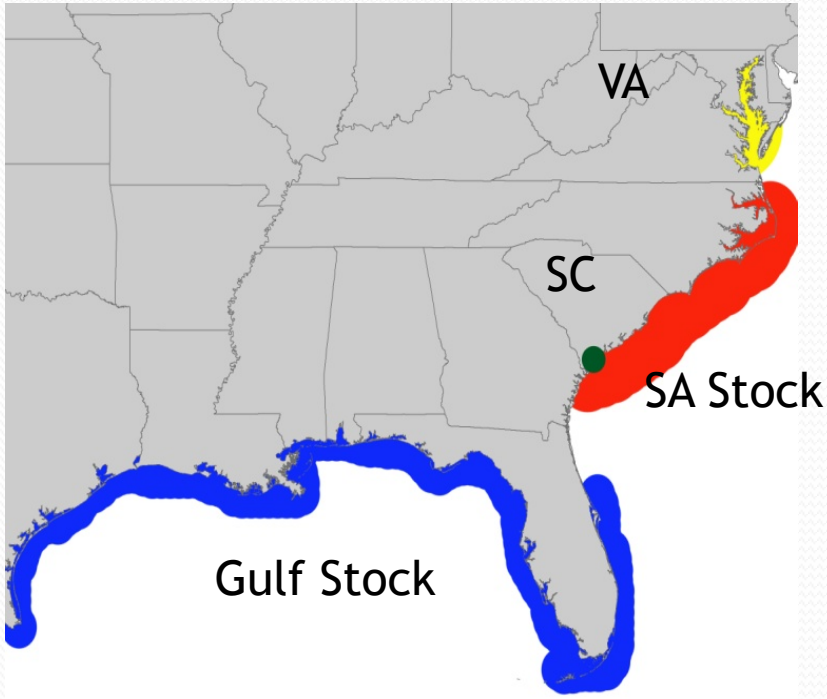
- Cobia in Port Royal Sound/St Helena Sound are part of a genetically distinct population segment (South Carolina Cobia).
  - Aggregations in April-June are scientifically proven inshore cobia spawning events.
  - Genetic analysis shows a significant decrease in number of inshore spawners in recent years.

- Results of the stock assessment show significant declines in spawning stock biomass and increases in fishing pressure for the entire South Atlantic population.
  - Because of easy access by anglers, the South Carolina cobia endures higher fishing pressure than the SA population.
  - Recreational and charterboat effort, and catch has increased.
  - There is a high likelihood that the DPS is decreasing in abundance while maintaining CPUE (Illusion of Plenty).

- Stocked fish make up a very high portion of the catch suggesting the wild population is small.
  - A conservative population estimate shows the population at <50,000 fish.

Genetic Population Structure

- Distinct South Atlantic and Gulf stocks
- Distinct population segments within the South Atlantic
  - Genetically different population
  - Identified during spawning aggregations
  - No morphometric differences
  - Limited gene flow between pops
  - Supported by tag-recapture data
  - Exhibit natal homing



Darden, T, M. Walker, K. Brenkert, J. Yost and **M.R. Denson**. 2013. Population Genetics of Cobia Rachycentron canadum: Management Implications along the Southeastern U.S. Coast. Marine Biology.

Lefebvre, L. and **M.R. Denson**. 2012. Inshore spawning of cobia (*Rachycentron canadun*) in South Carolina. Fishery Bulletin. 110:397–412.

Genetically-Determined Population Size

Year Class	Lower Bound	Effective Population Size (Ne)	Upper Bound
2004	329	**425**	
2005	223	**889**	-
2006	-	**-**	-
2007	81	**401**	-
2008	248	**615**	-
2009	56	**78**	120
2007-20013 Inshore	456	**545**	664
2007-2013 SA	1,655	**2,948**	10,530

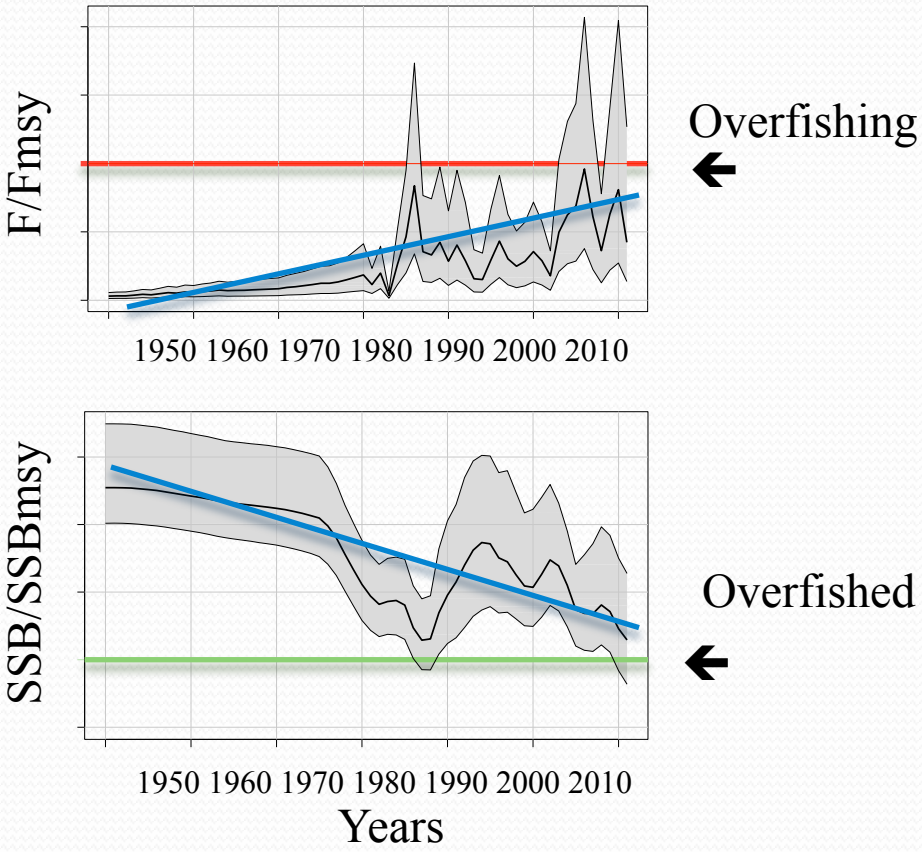
Insufficient samples to calculate Ne

Ne =Effective population size is the number of individuals in a population who contribute offspring to the next generation.

2012 Stock Assessment Conclusions

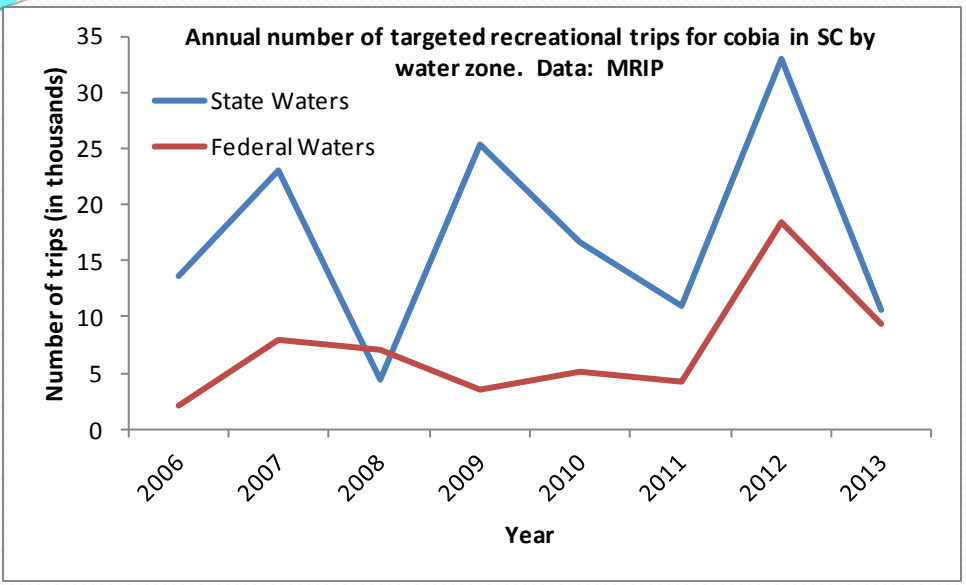
(South Atlantic Population Including DPSs)

- Statistical catch-at-age model
- Biological reference points
  - Based on landings data
  - Life history data
- 2007 and 2009 approaching overfishing SSB/SSBmsy and increasing uncertainty
- Regional fishing pressure appears to be increasing
- Model biomass estimates are 250,000 recruits per year



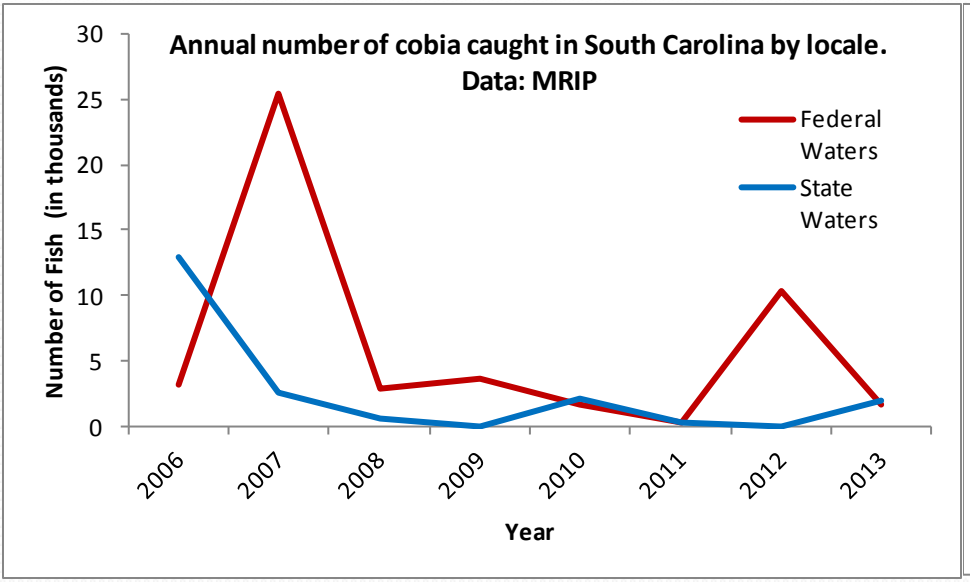
SEDAR 28 Cobia

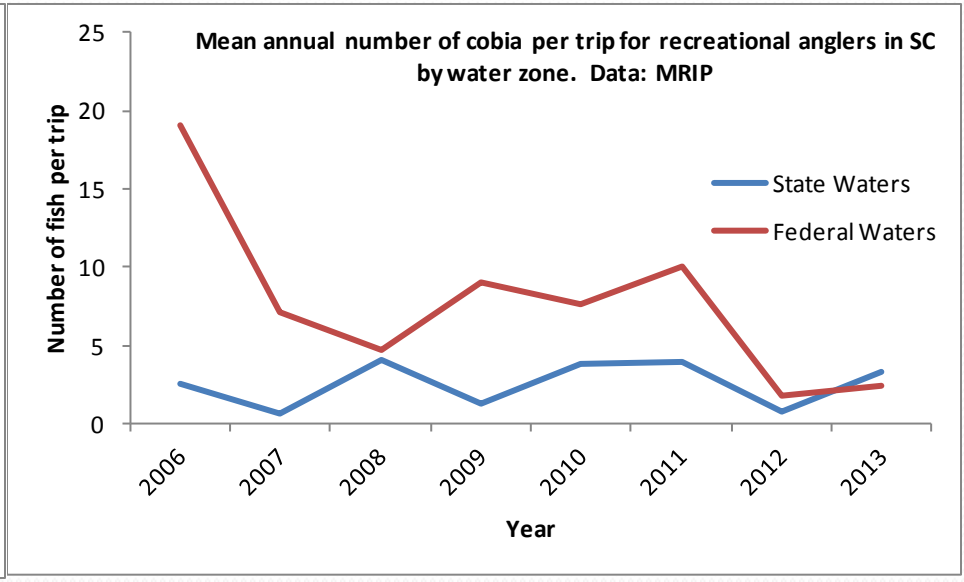
RECREATIONAL FISHERY: EFFORT ESTIMATES
(USING TARGETED/DIRECTED EFFORT: MRIP)



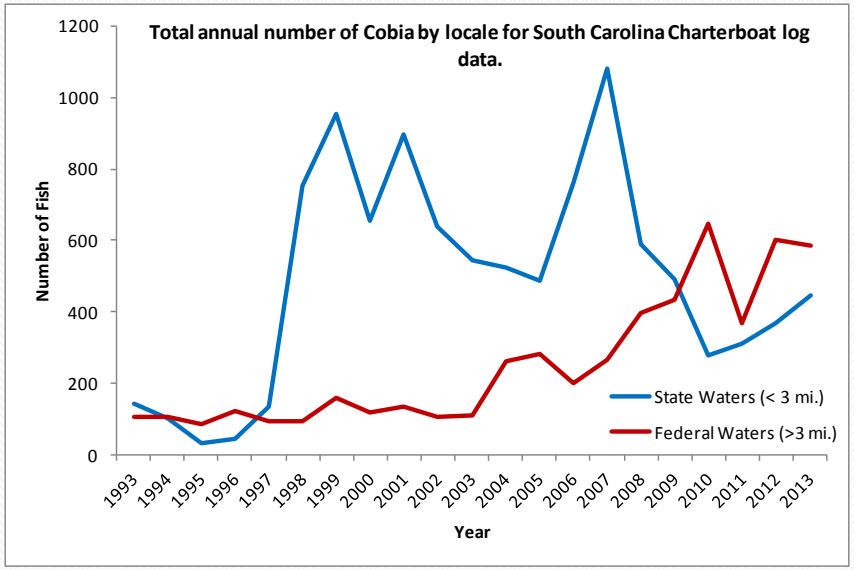
•There is a higher proportion of cobia specific targeted trips that occur in state waters over federal waters. However, nominal catch effort is higher in federal waters than in state waters.

• The trend in directed trips is driven almost entirely by wave 3 (May – June) in state waters.



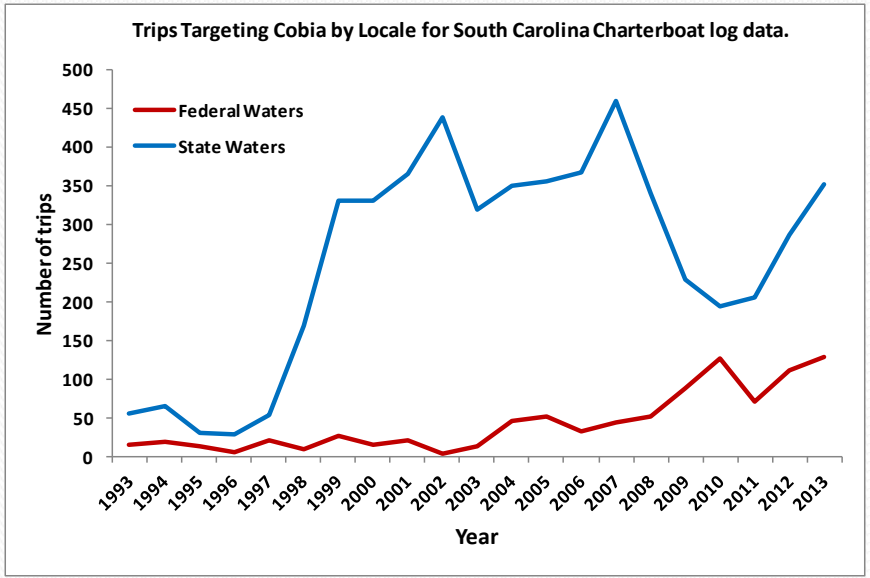


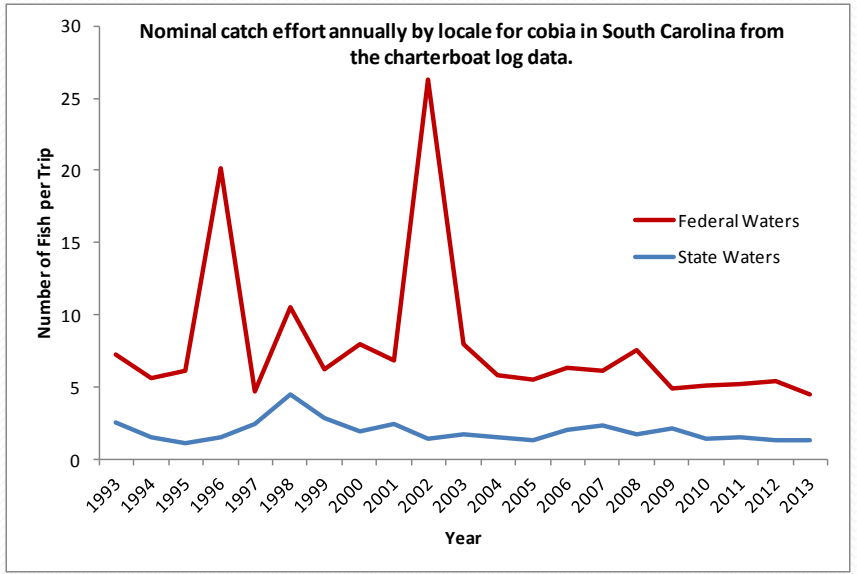
South Carolina Charter Boat Log Data

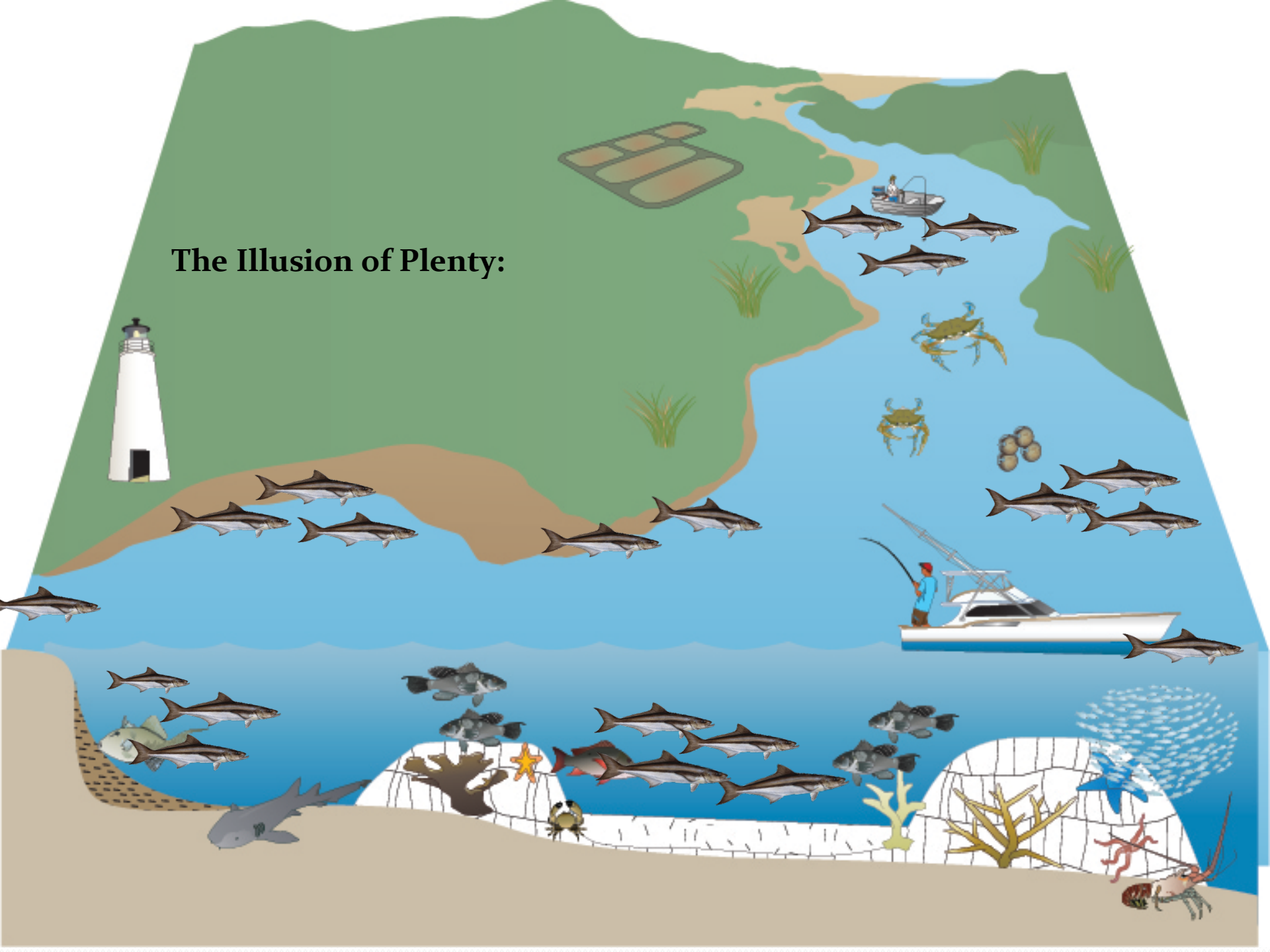


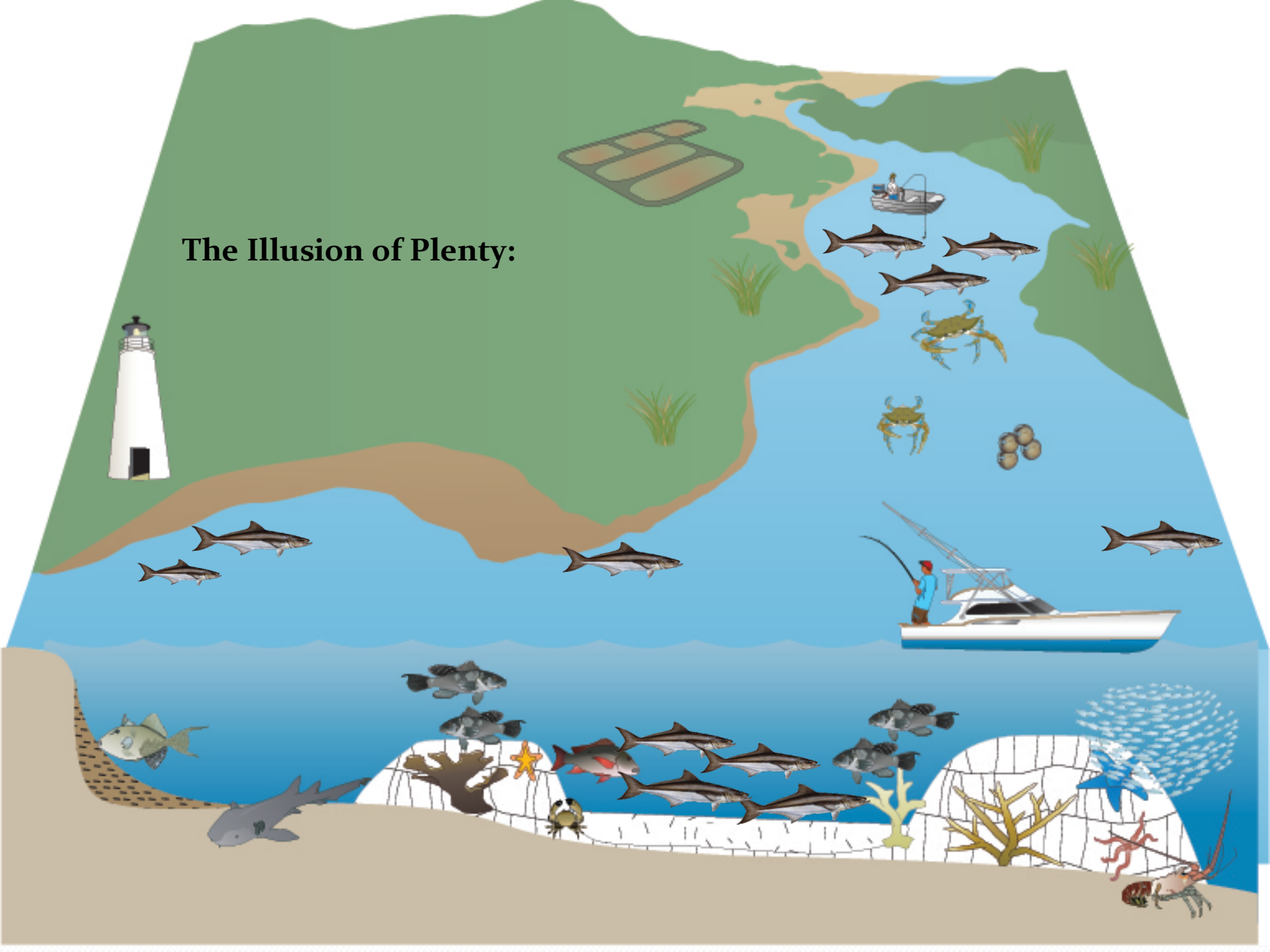
- Both total catch of cobia and trips targeting cobia for charter boats have been increasing in federal waters for the last ten years while decreasing in state waters since the peak in 2007.

- However, nominal CPUE for charter boats in both state and federal waters has remained relatively stable since the peak in 2002.






The Illusion of Plenty: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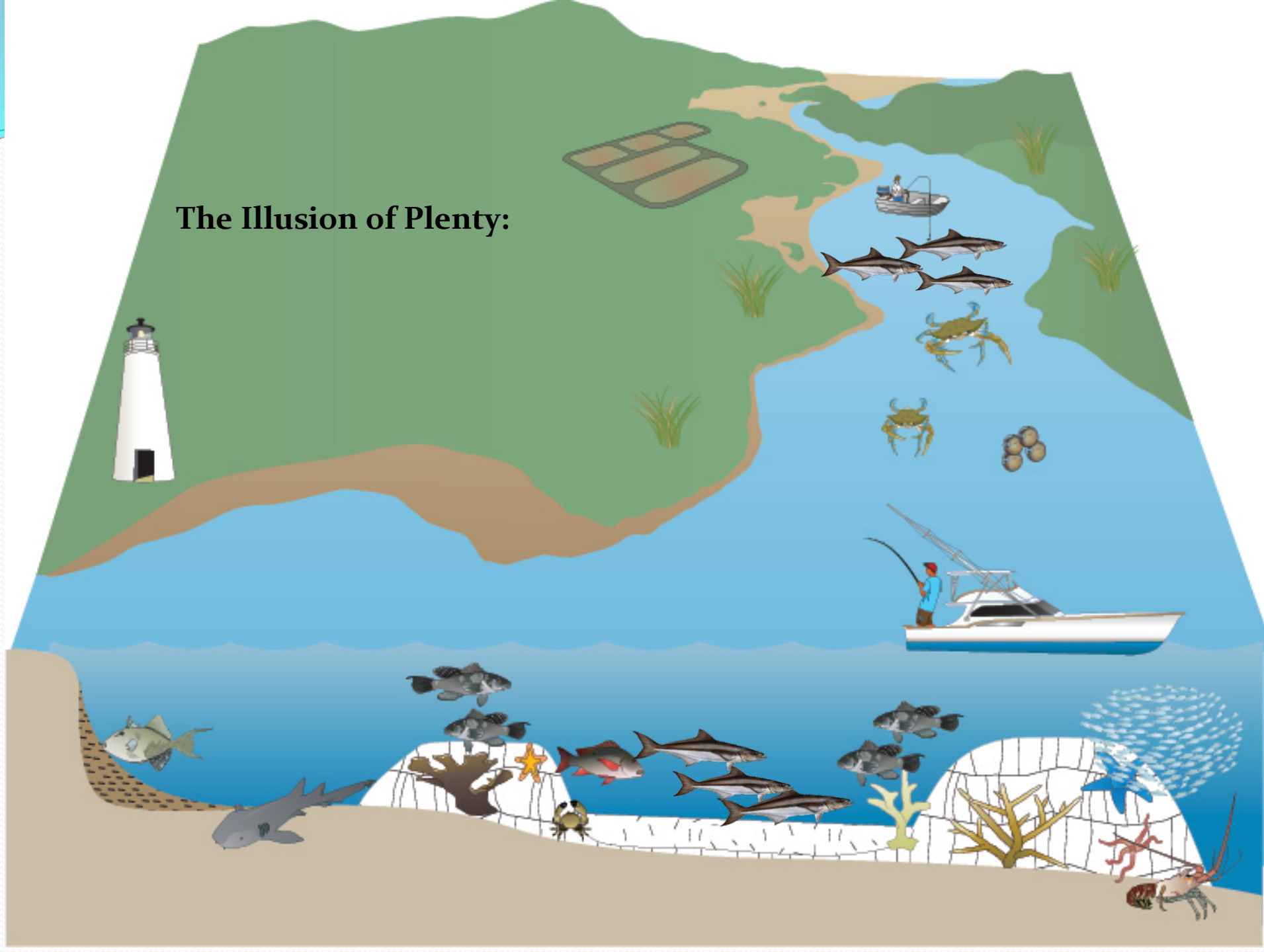
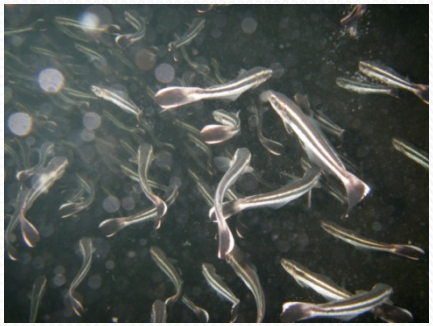

The Illusion of Plenty:

The Illusion of Plenty: Hyperstability

- Decrease in abundance when CPUE stays the same
  - Ex. when spawning aggregations are fished (Nassua grouper, salmon, cobia)
  - Ex. when fish form very large schools at known locations (cod, haddock, pollock)
  - Fishing appears to be good and then the bottom falls out.
  - You can detect hyperstability by rigorous long-term fisheries-independent random sampling
    - No FI sampling for cobia
    - Compare to similar species/fisheries

Waddell Center Stocking



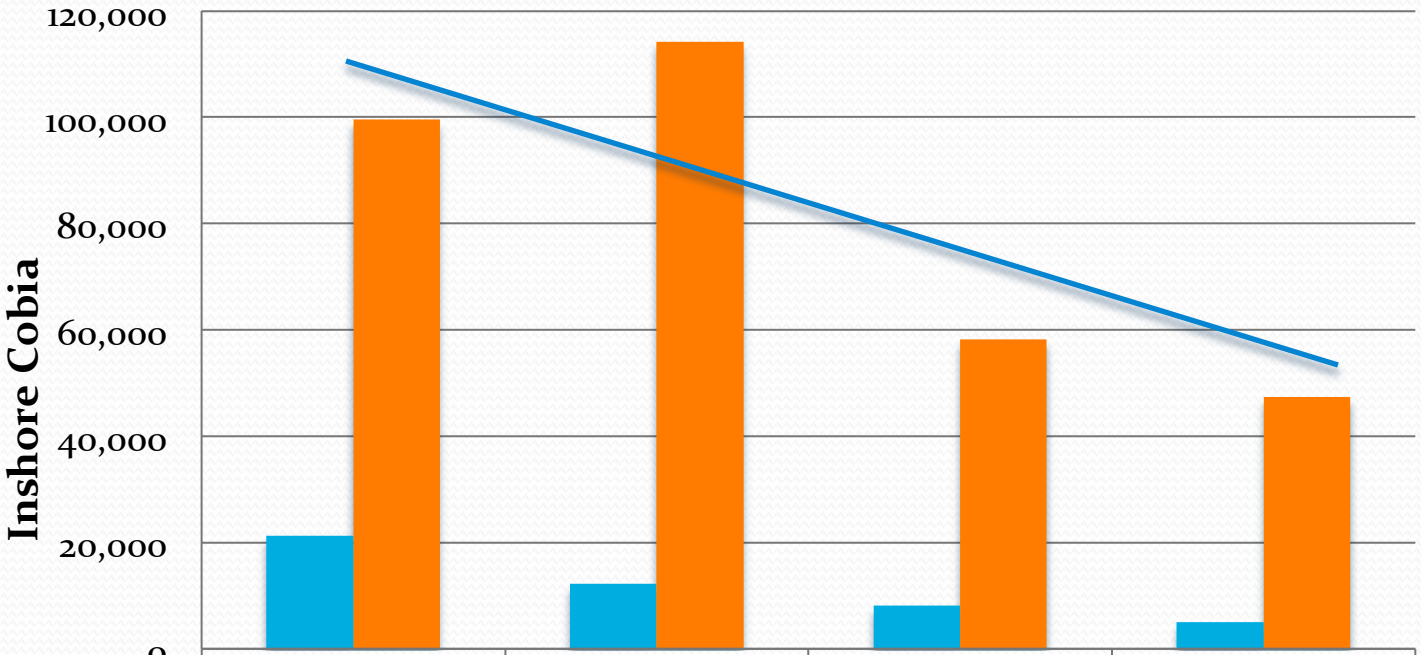
- Spawned from local wild broodstock
- Reared in ponds
- Large size range
- Externally tagged and genetically marked

Year class	Number released
2004	2,083
2005	6,184
2007	53,732
2008	2,054
2009	1,392

Contribution to Wild Year Class

Stocking Year (# stocked)	Sample Year					
	2008	2009	2010	2011	2012	2013
2005 (6,184)	0	0	9.1	0	0	0
2007 (53,732)	*	70.0	40.0	23.1	68.8	83.3
2008 (2,054)	*	*	0	3.4	0	0
2009 (1,392)	*	*	*	0	0	0

Population Estimate of Inshore Cobia



	2010	2011	2012	2013
Stocked	21,212	12,239	8,127	5,079
Wild	99,537	114,242	58,250	47,416

2013 total =47,416 ± 24,389

Value of Conserving the DPS

- Economic value
- Cultural value
- Maintaining genetic diversity

Conclusions

DNR

- Number of inshore spawners
- Number of adult fish in population
- Recreational effort, and catch
- Charterboat effort, and catch

How Do We Conserve This Inshore Population and This Fishery?

- Some supportive stocking effort?
- Reduced catch limit to 1 fish/person/day
- Reduced Boat limit 1 fish/boat/day
- Close season partially or completely to catch and release only
- Institute a slot or size limit

Creel Limits

- 1 fish/person/day = **12.7%** reduction in catch
  - 90% catch =recreational, 10% charterboats
- 1 fish/boat/day = **33.0%** reduction in catch
  - Most recreational anglers only catch 1 fish/boat
  - 66% of charterboats only 1 fish/trip
  - 34% of charterboats catch more than 1 fish/boat

Seasonal Closures

- Catch and release April-May=**47.9%** reduction in catch
- Catch and release April-June=**89.3%** reduction in catch

Size Limits

- Much more variable because of yearclass variation. In some years it could be very high and in other much lower.
  - Gaffing mortality for under and oversized fish?

New Cobia Rules

(March 1st 2015)

- Annual Catch Limit in South Atlantic
- -South Atlantic is GA, SC, NC and VA

- (2013 ACL 1,445,687 lbs) Actual 1,142,947
- South Atlantic was FL, GA, SC, NC, VA

- SA 2015 Rec 690,000 lbs, east FL Rec 900,000 lbs 2015=1,590,000