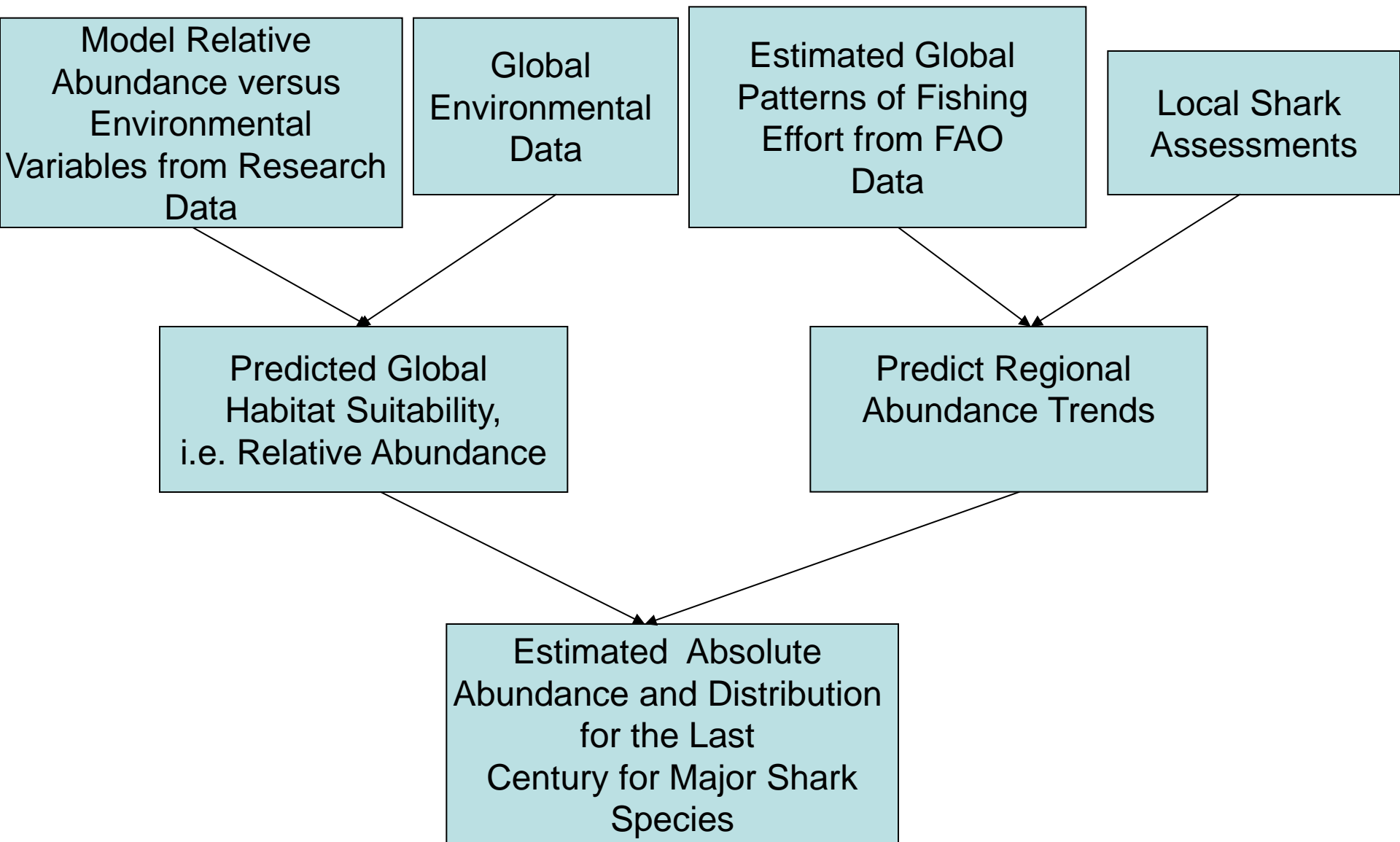


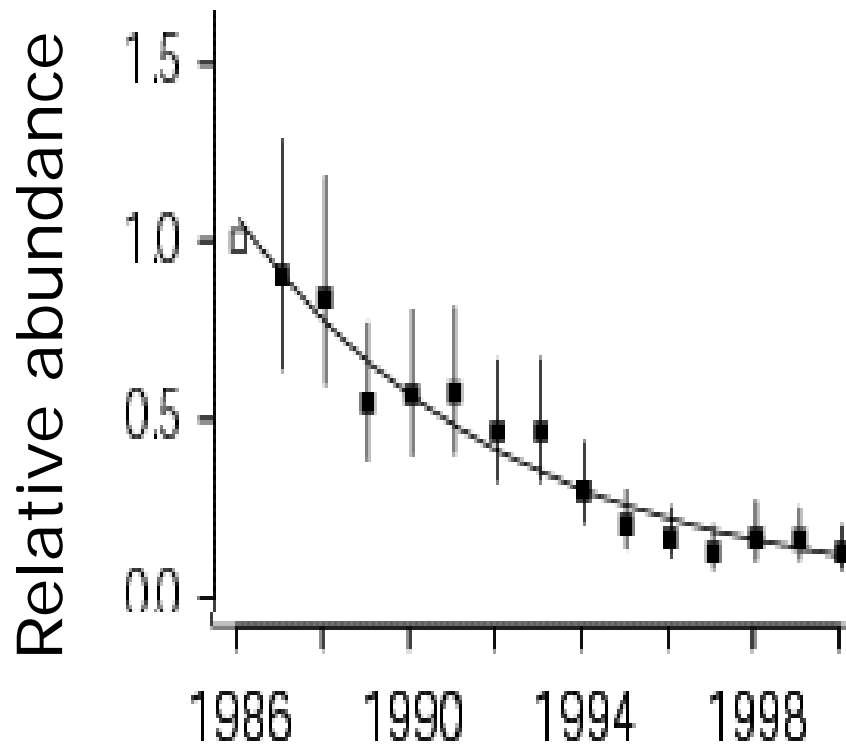
# Mapping the History of Major Maine Species





# Hammerhead sharks

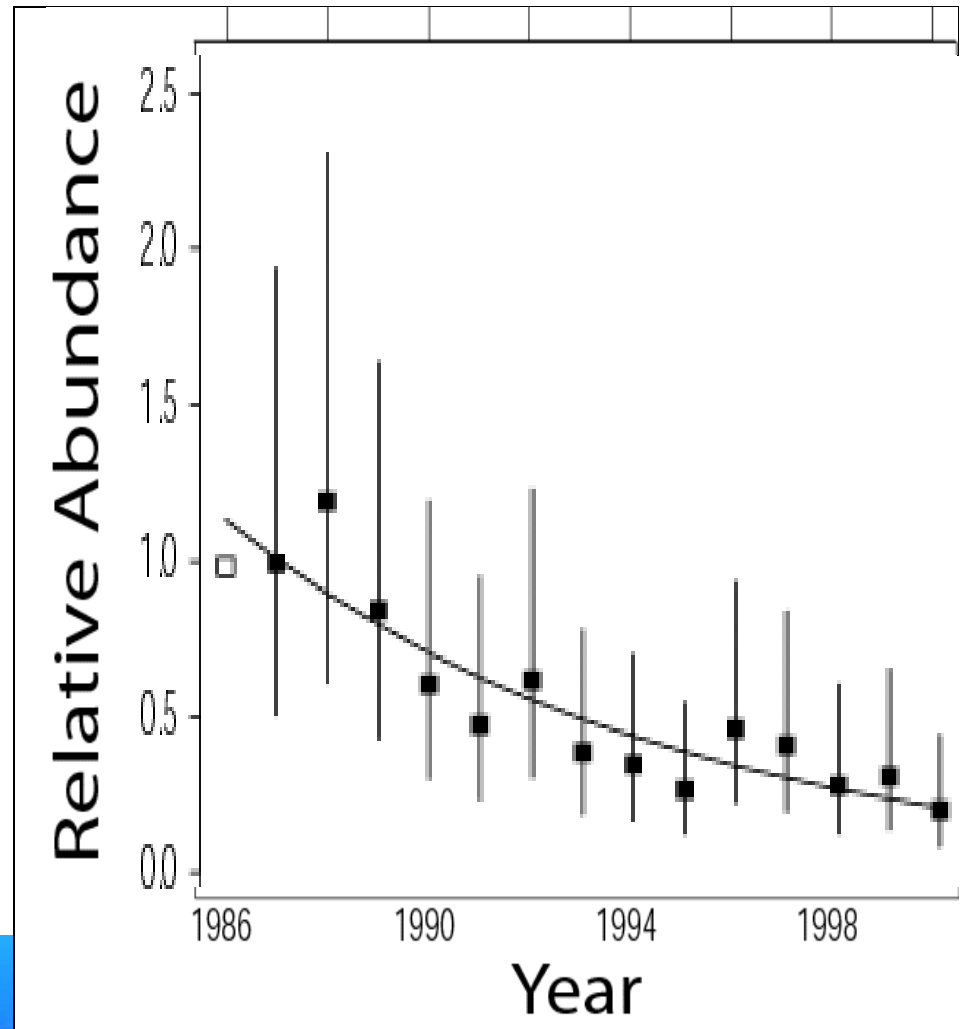
*Sphyrna lewini*



Science. Jan. 2003. J.K. Baum, R.A. Myers, D.G. Kehler, B. Worm, S.J. Harley, P.A. Doherty

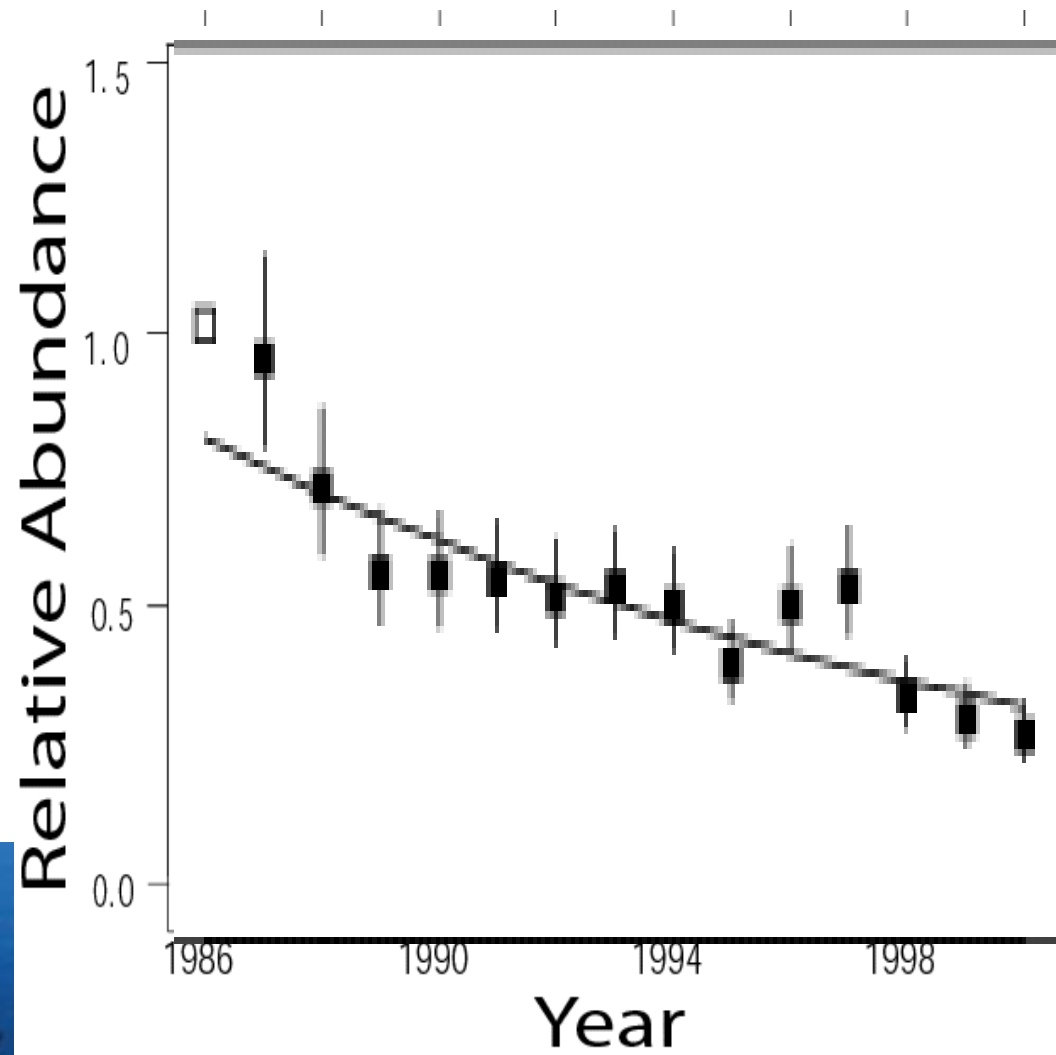
# Thresher sharks

*Alopias spp.*

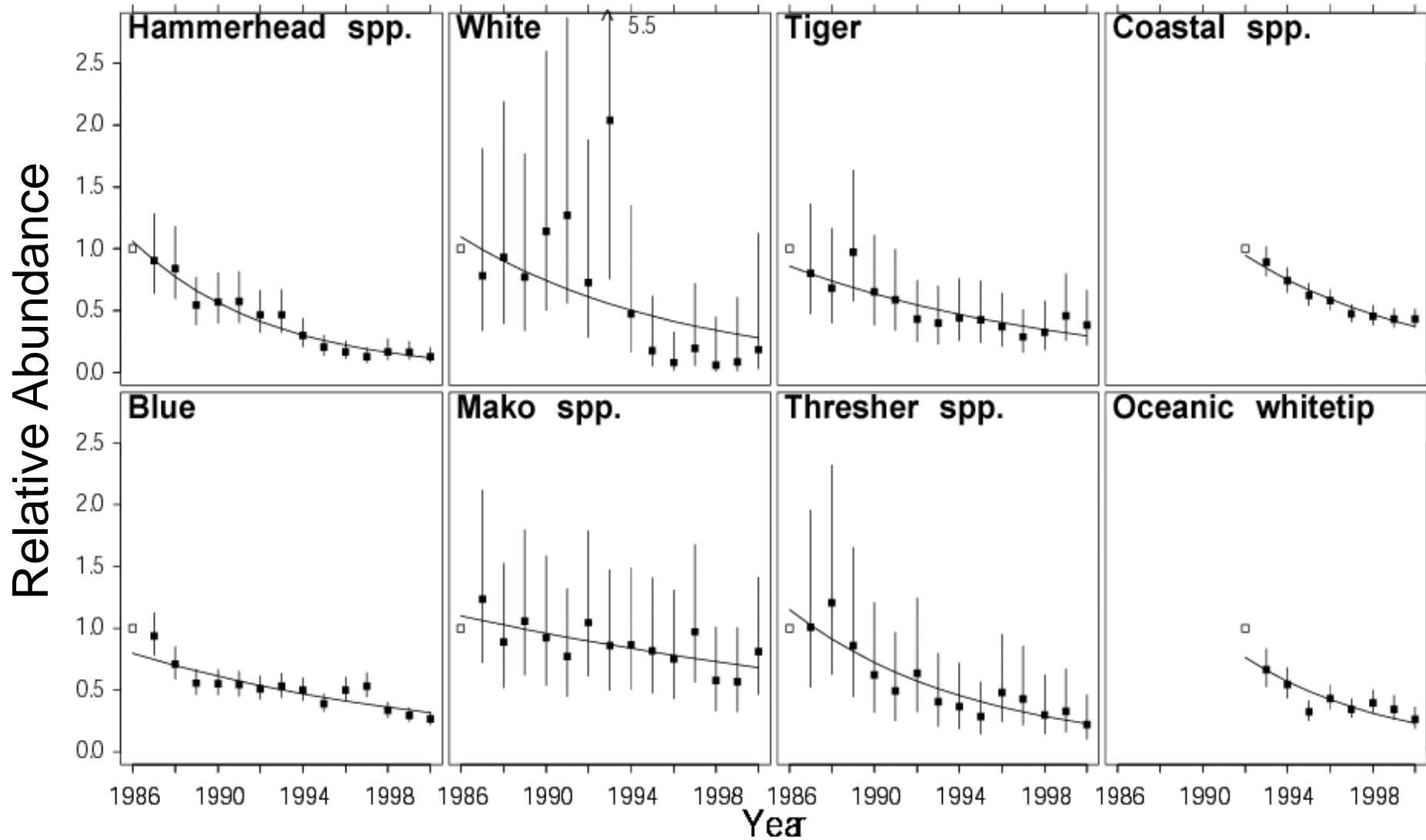


# Blue sharks

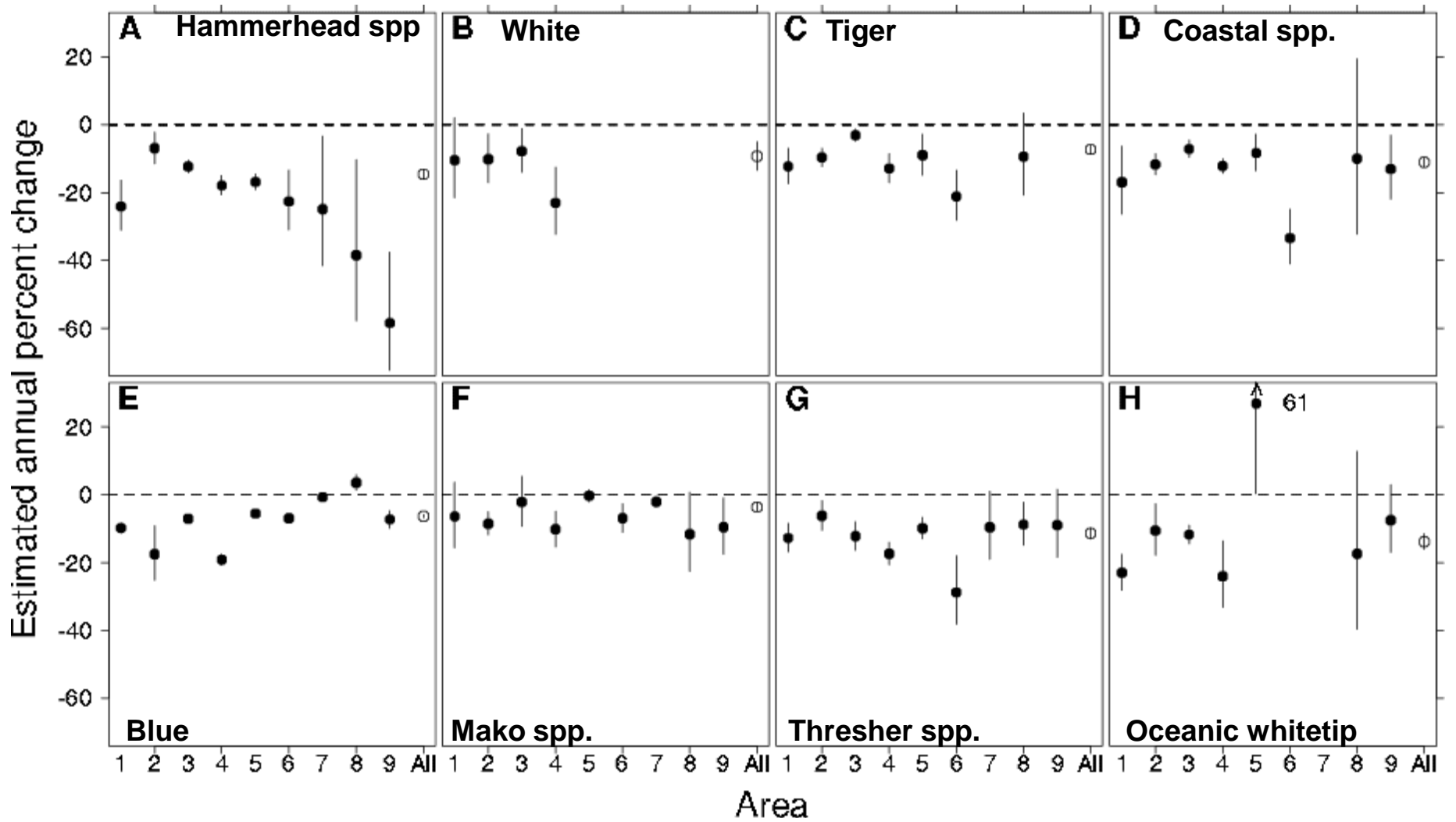
*Prionace glauca*

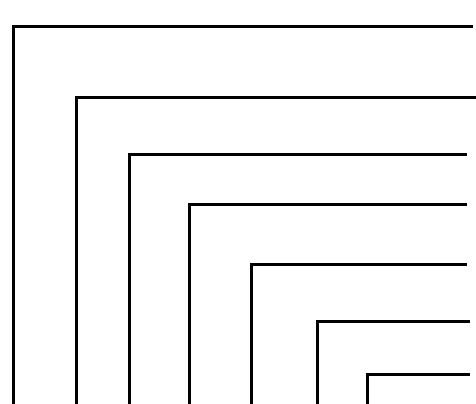


# Results

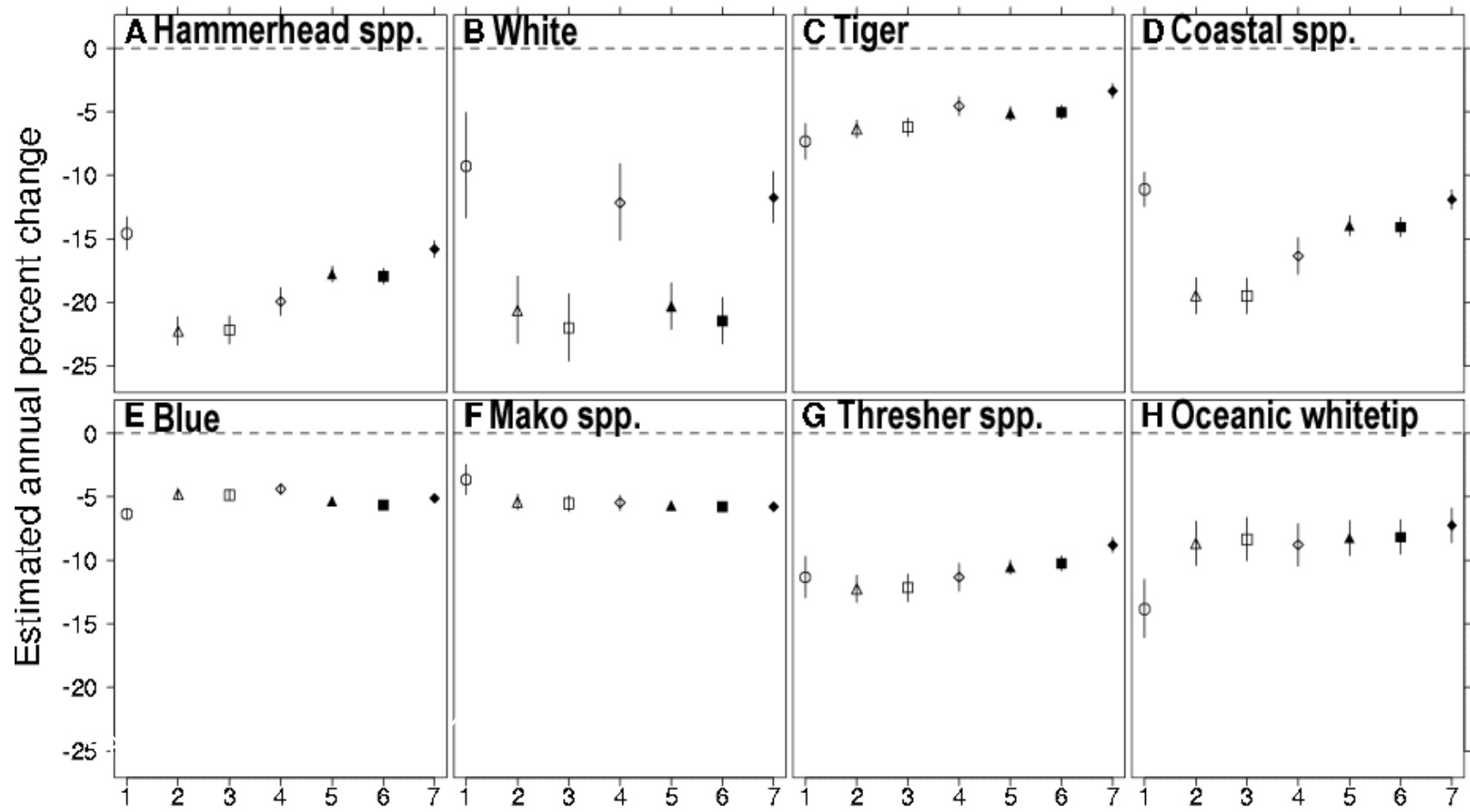


- 1 Caribbean
- 2 Gulf of Mexico
- 3 Florida
- 4 S Atlantic Bight
- 5 Mid Atlantic Bight
- 6 NE Coastal
- 7 NE Distant
- 8 Sargasso
- 9 S America



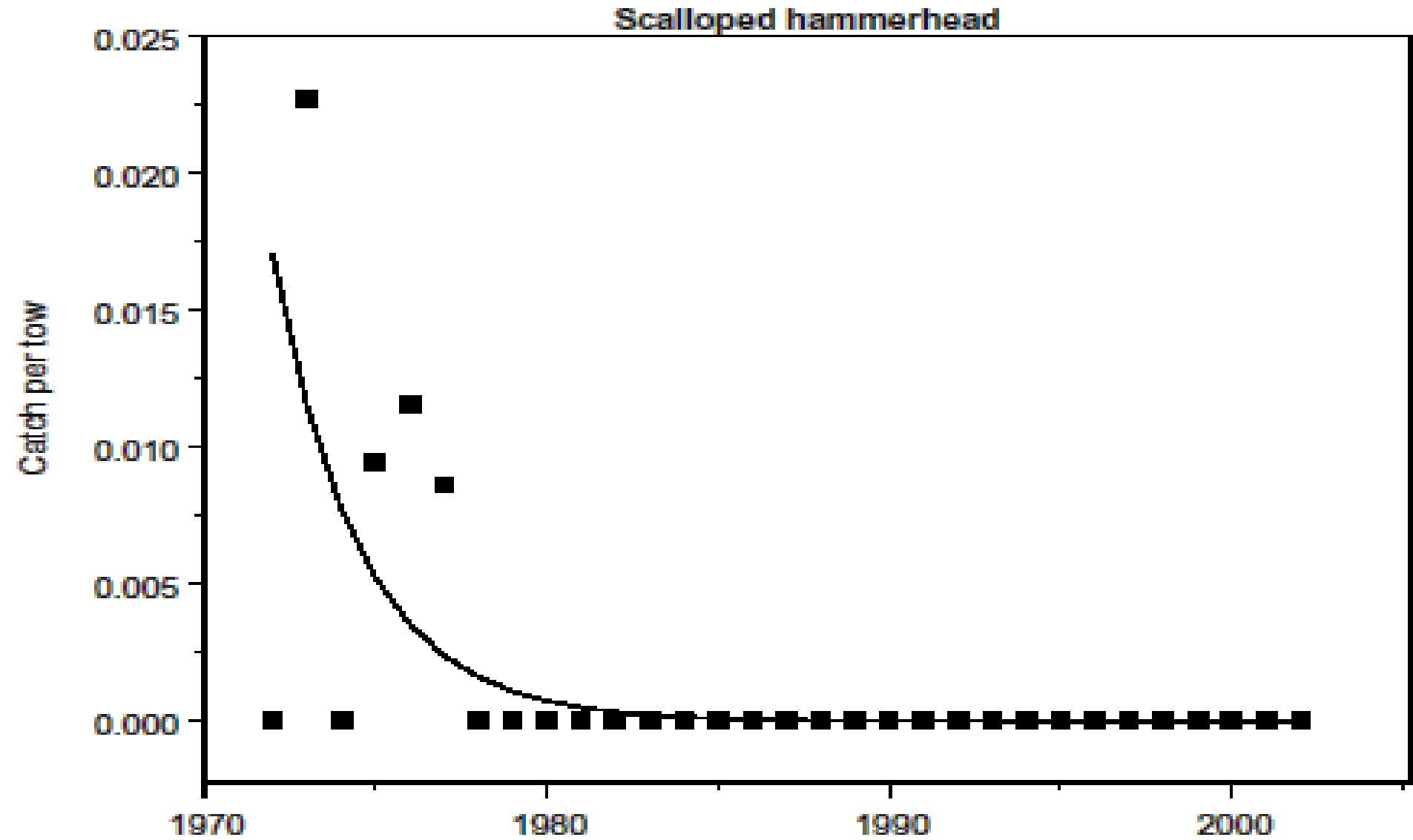


**TNB**  
**NB - all data**  
**NB - vessels recorded species once**  
**NB - vessels recorded species every year**  
**DL - all data**  
**DL - vessels recorded species once**  
**DL - vessels recorded species every year**



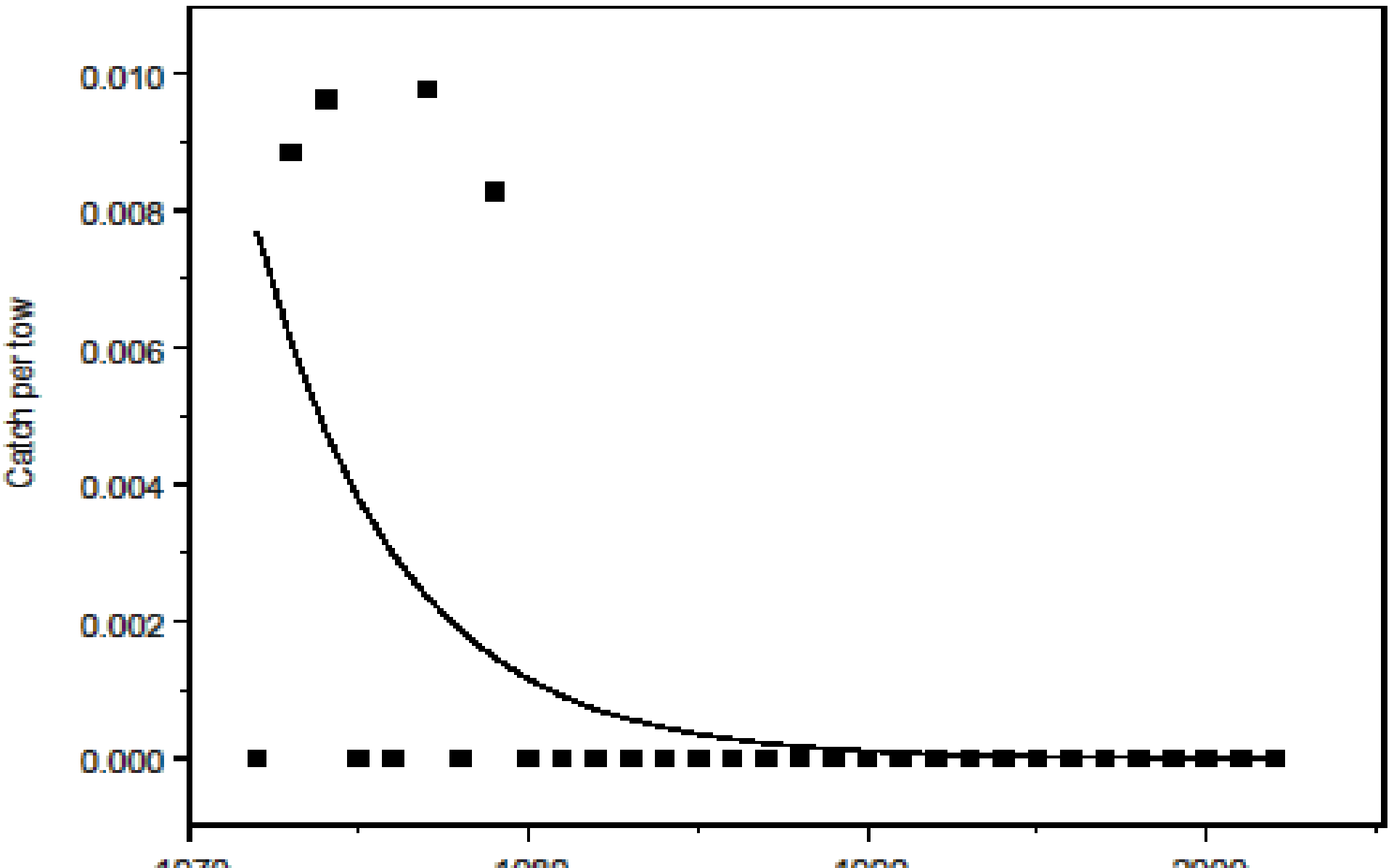


# Same results for trawl surveys in Gulf of Mexico



# Same results for trawl surveys in Gulf of Mexico

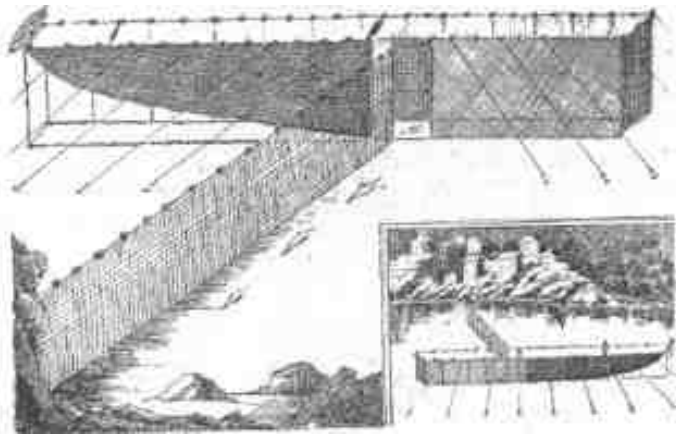
Great hammerhead



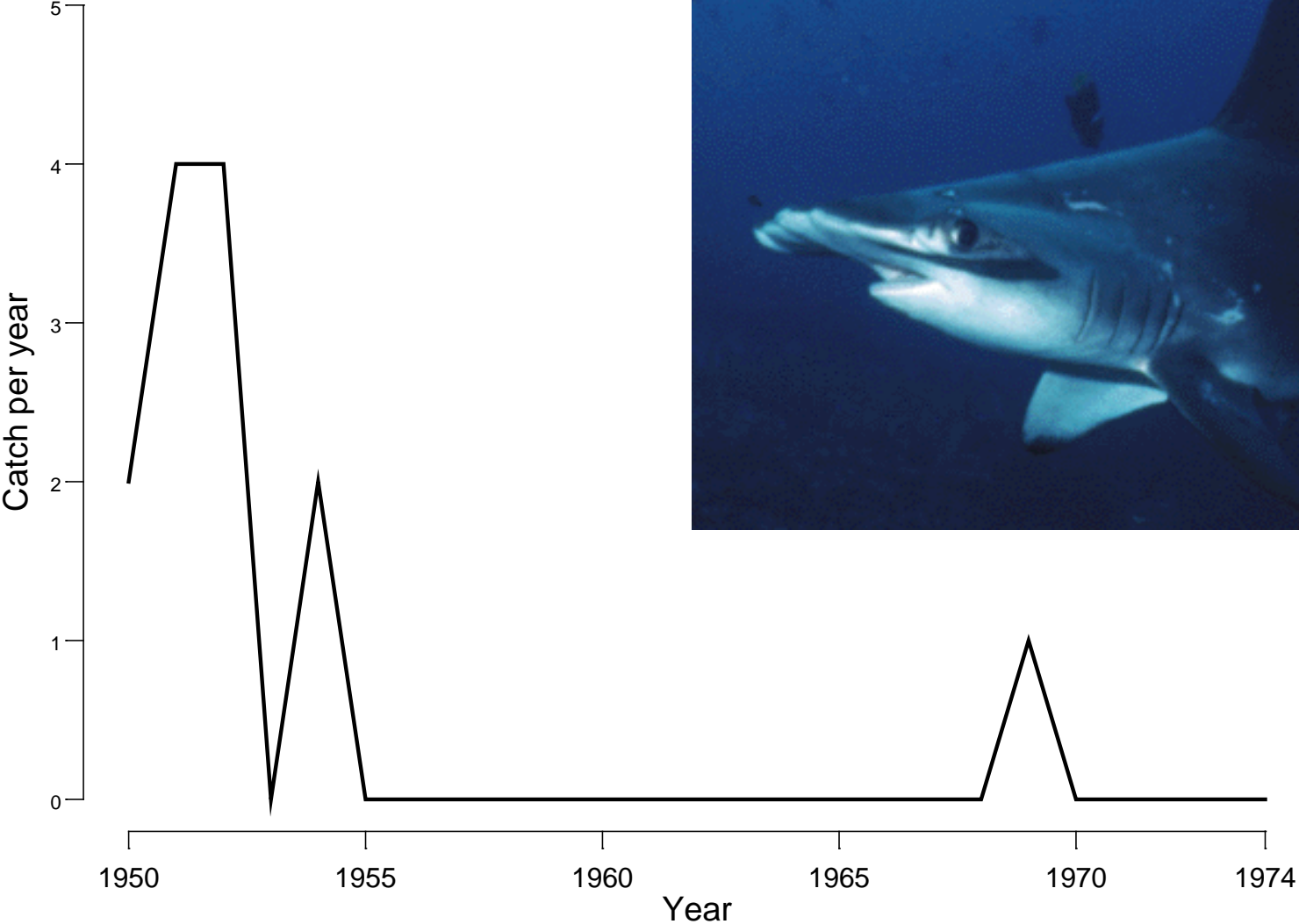
# Decline of Mediterranean Sharks

By catch associated with a Tuna Trap  
In Ligurian Sea

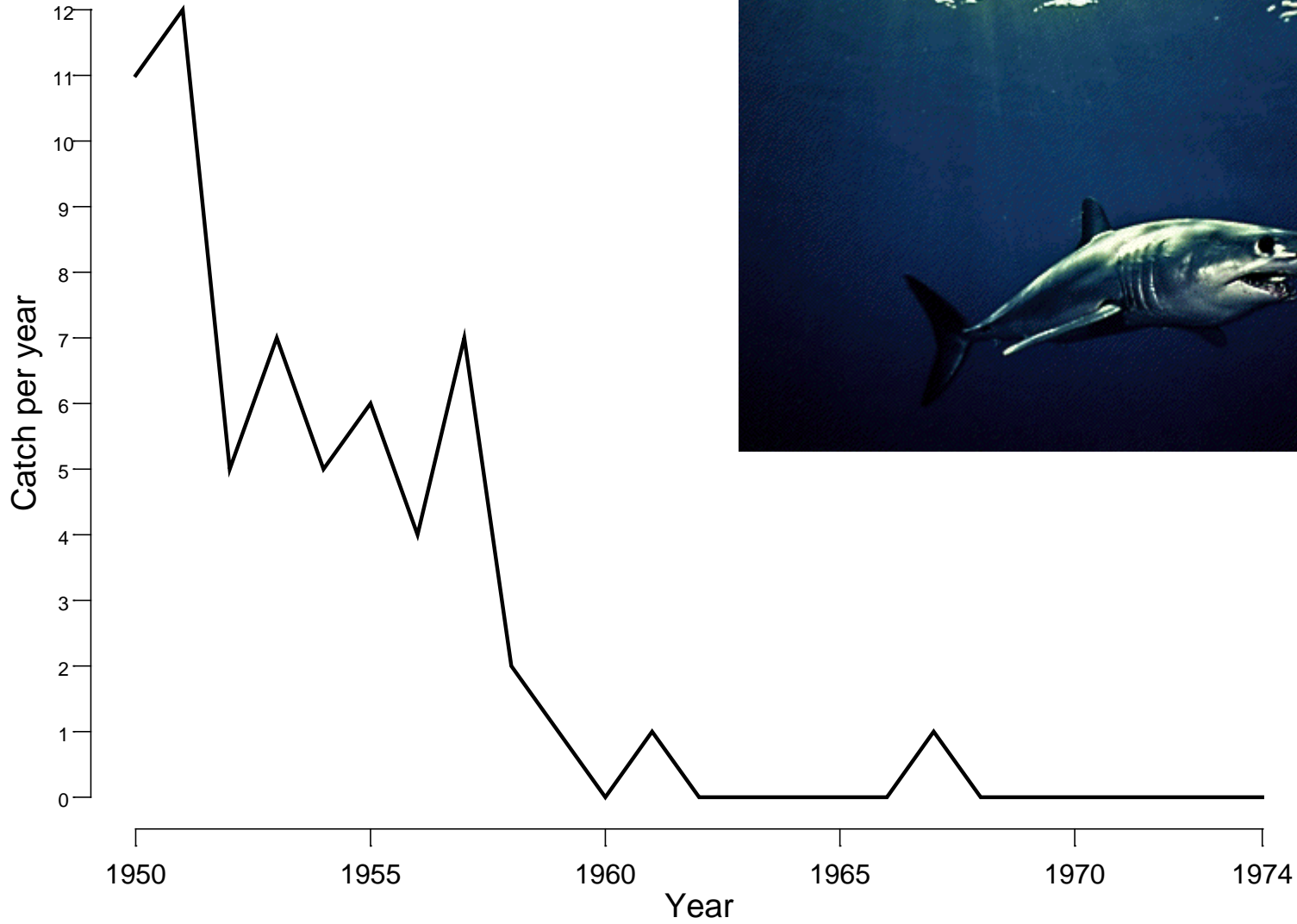
“Tonnara di Camogli”



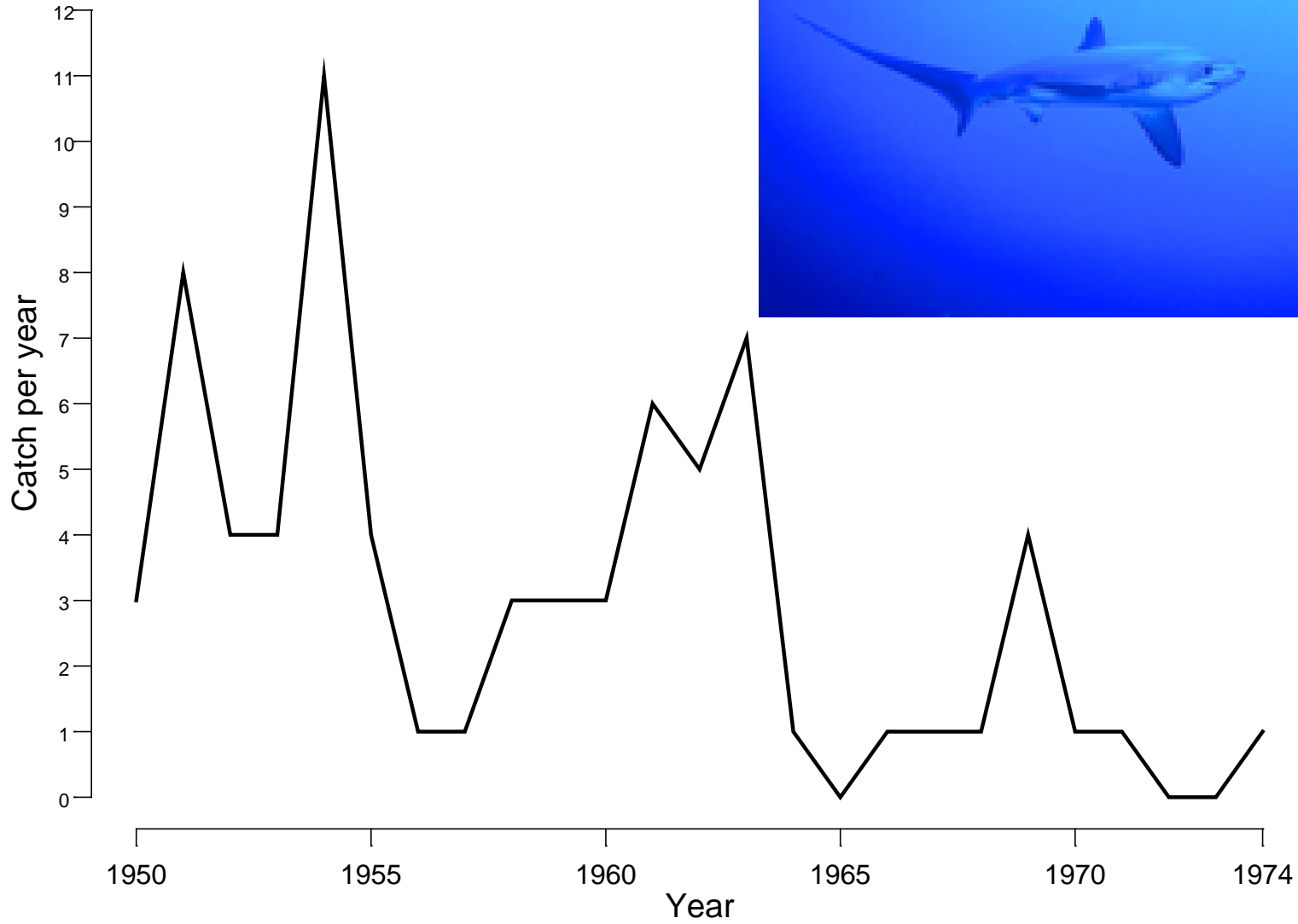
# Decline of Hammarhead sharks



# Decline of Mako sharks



# Decline of Thresher sharks



# Decline of Mediterranean Sharks

By catch associated with a Tuna Trap  
In Tirrenian Sea

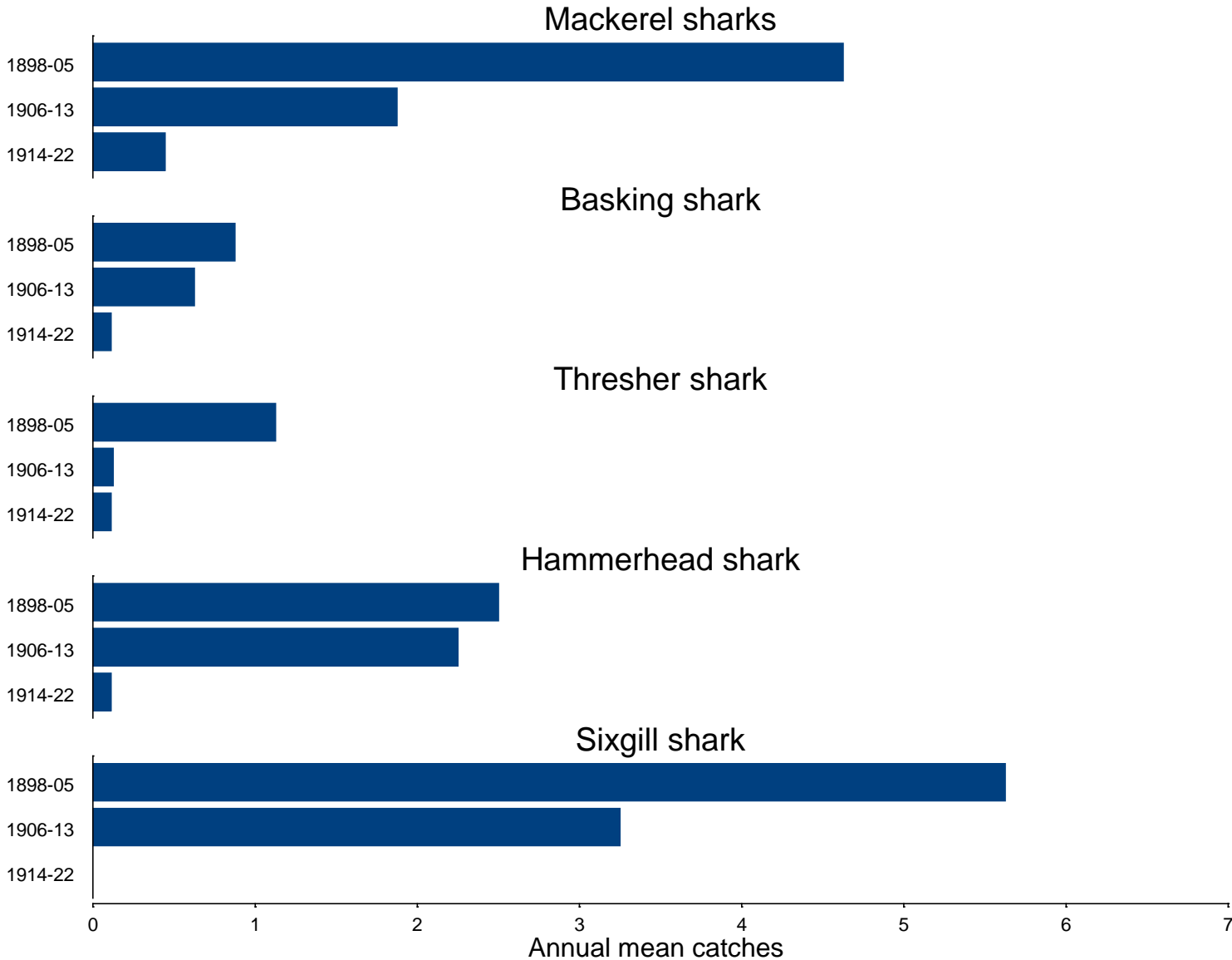


“Tonnarella di Baratti”



# Decline in Large Sharks's Catches by an Italian Tuna Trap

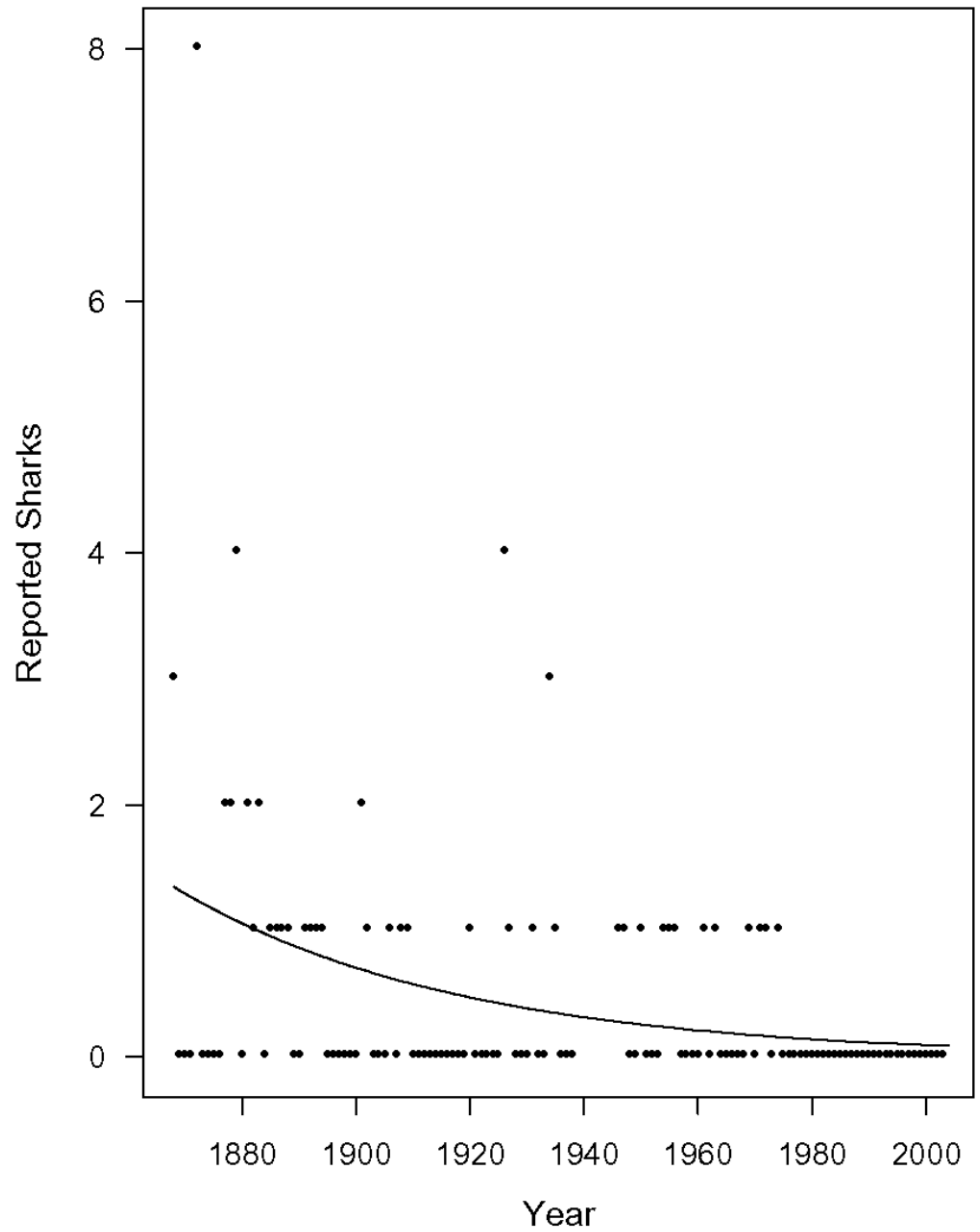
## Baratti's "Tonnarella"





Fitting a simple model to crazy data can yield reliable, and very powerful conclusions

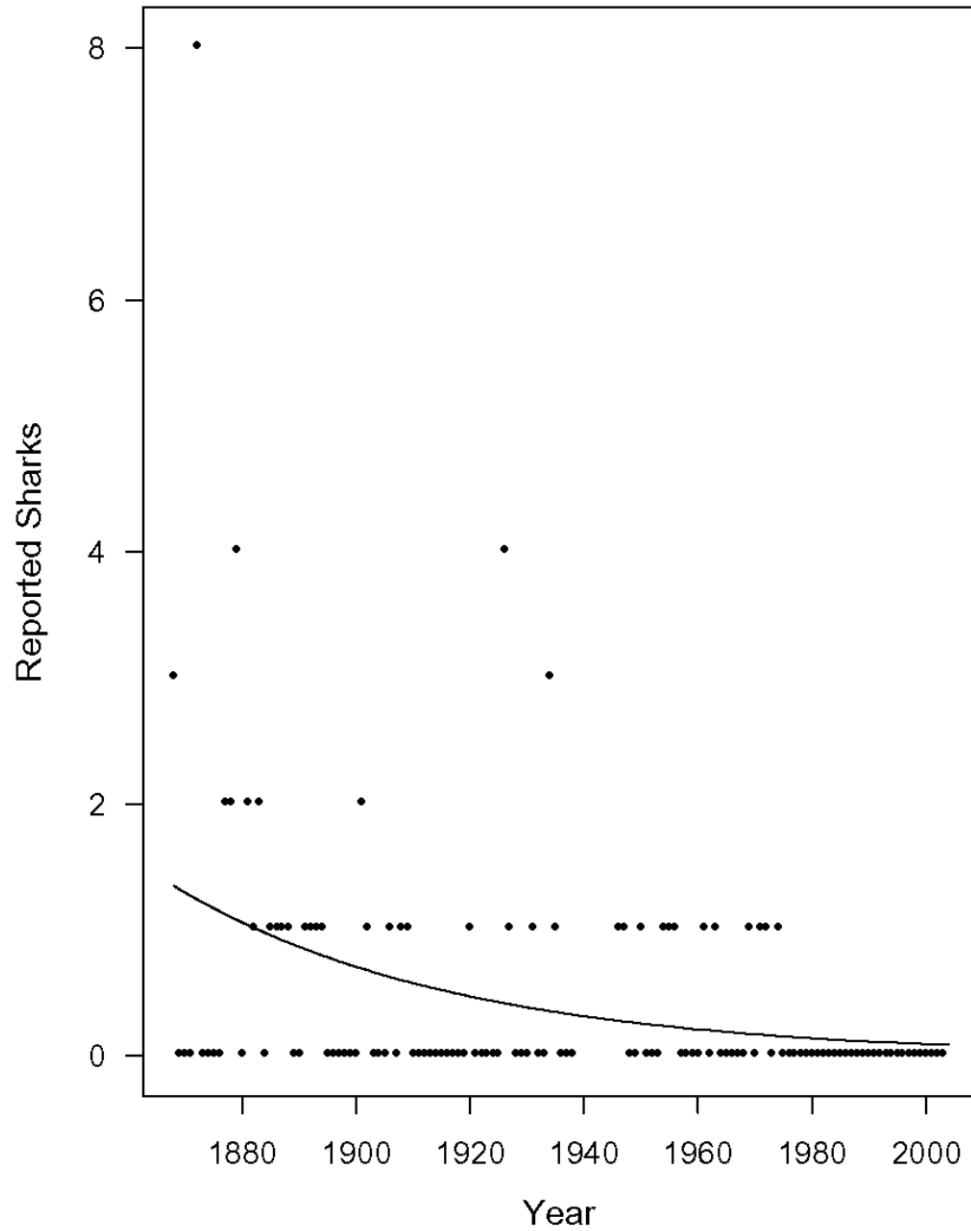
Newspaper reports of sharks in Croatia



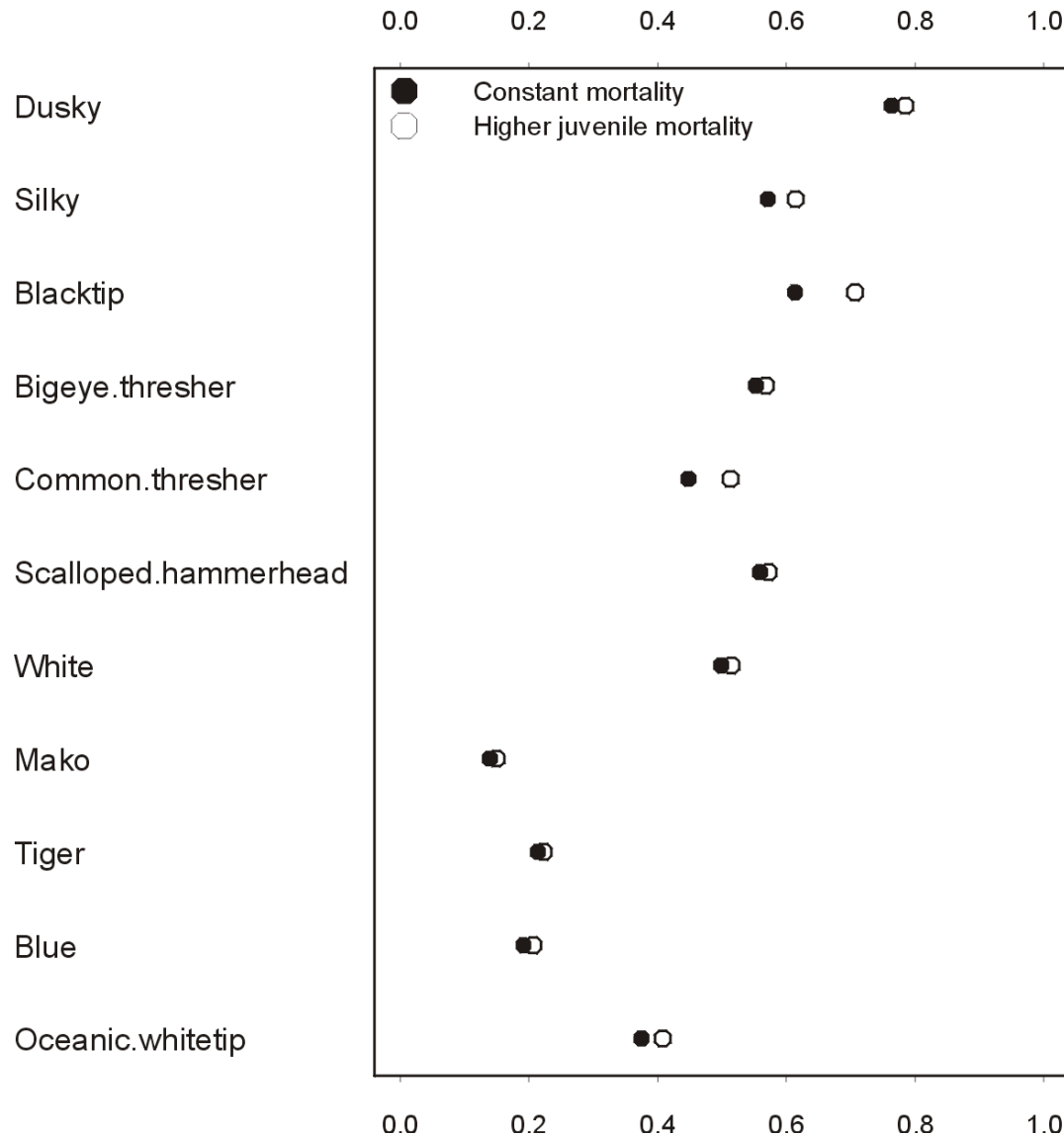
# With training, “experts” can ignore the most obvious of data:

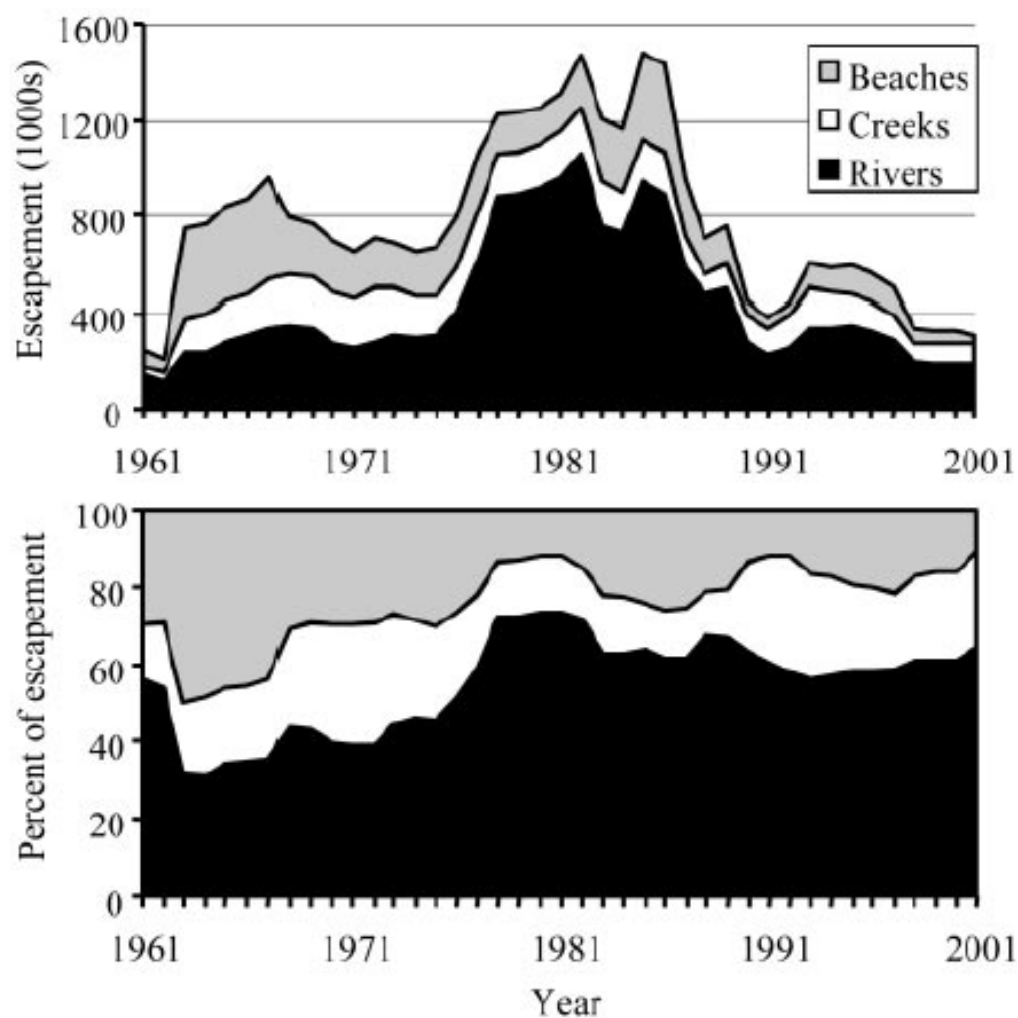
- 1872 - Man's head and leg and dolphin in stomach
- 1872 – 8 Great White Sharks reported caught
- 1888 - Woman's body and lamb in stomach
- 1894 - Preserved at Zagreb Nat. Hist. Mus.
- 1926 - Woman's shoes, laundry in stomach
- 1946 - Pig of 10 kg in stomach
- 1950 - Encounter during eating a dead calf
- 1954 - Attack on boat
- 1975+ - **No sightings.**

# Newspaper reports of sharks in Croatia



# Proportional reduction in current fishing mortality needed to ensure survival of shark populations

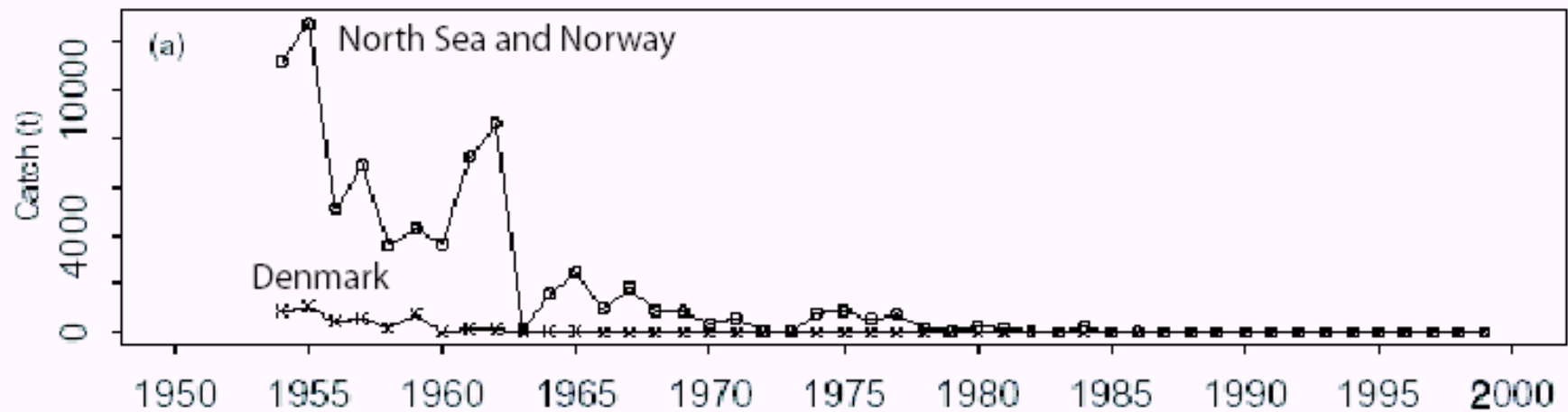




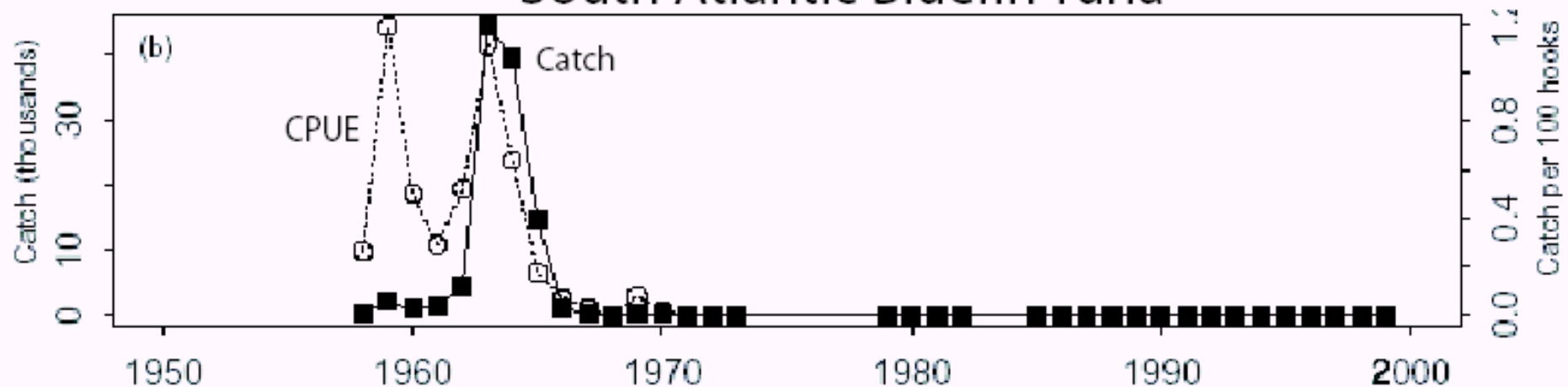
**Fig. 5.** The absolute (*Upper*) and relative (*Lower*) contributions of sockeye salmon using three types of spawning habitats within the Iliamna Lake system since 1961. Data have been smoothed with a 5-year running mean to emphasize the long-term trends.

# Loss of Bluefin Tuna Populations in the Atlantic

## North Sea Bluefin Tuna



## South Atlantic Bluefin Tuna



*There are at least 2 scalloped hammerhead sharks in the Northwest Atlantic*



Stoner, D. S., J. M. Grady, W. B. Driggers, K. A. Priede and J. M. Quattro. Molecular Evidence for a Cryptic Species of Hammerhead Shark (Genus *Sphyrna*). *Marine Biology* (submitted).

# Vacchi et al (2000) in Tuscany, on the Baratti's Tuna trap

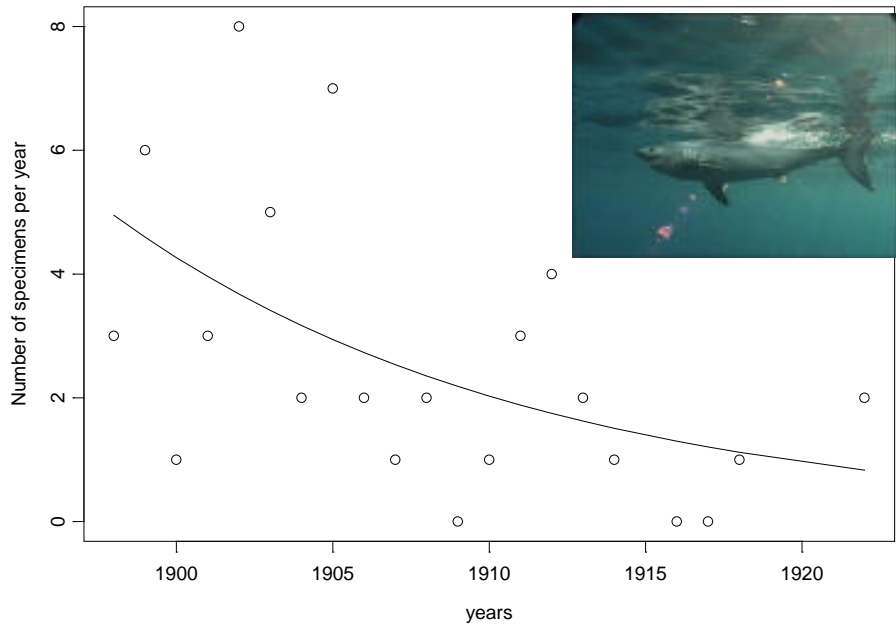


“Tonnarella di Baratti”

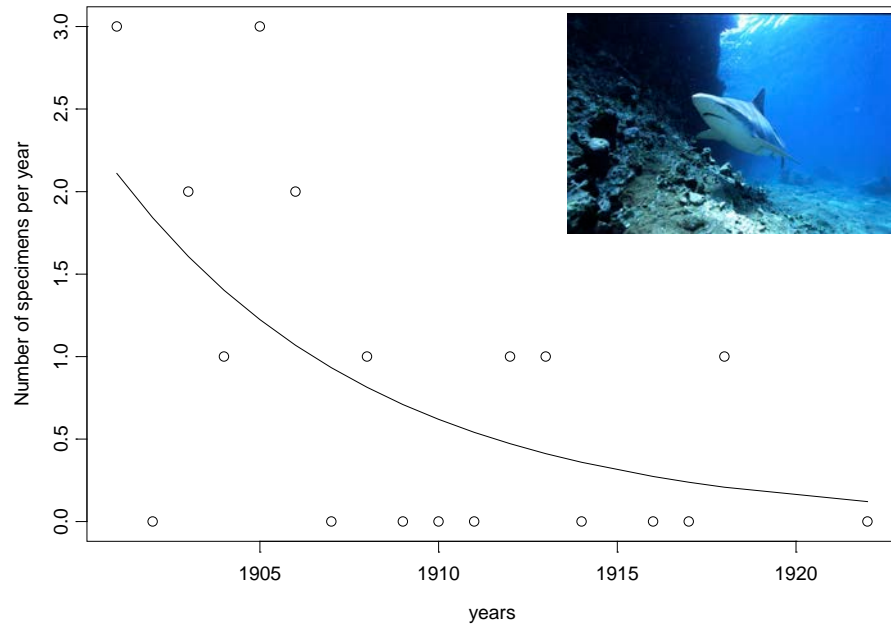




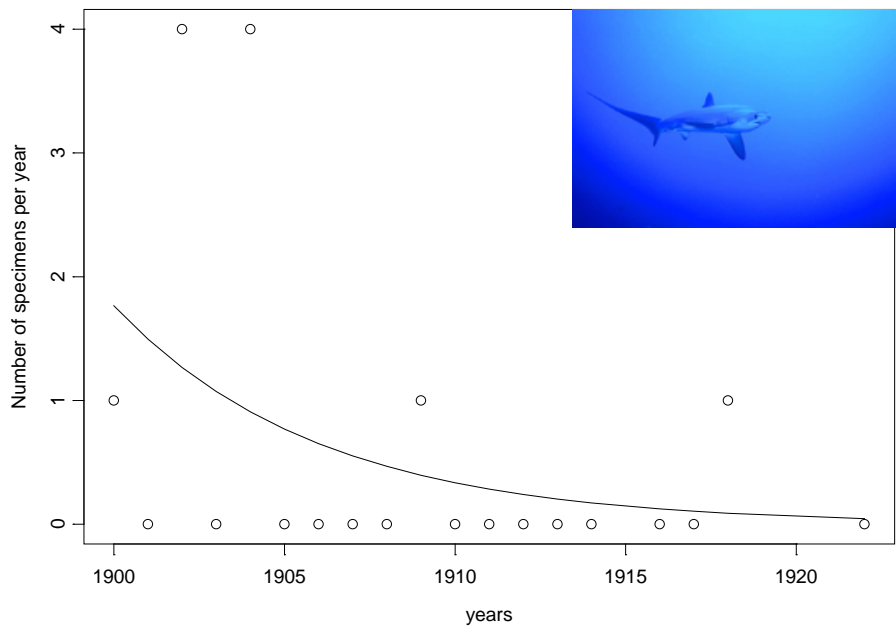
Porbeagle shark



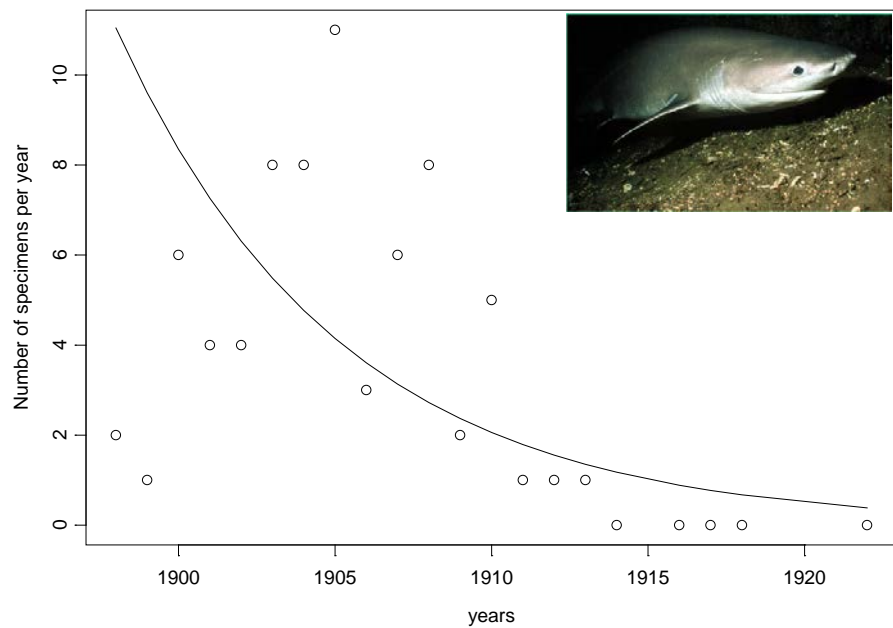
Sandbar shark



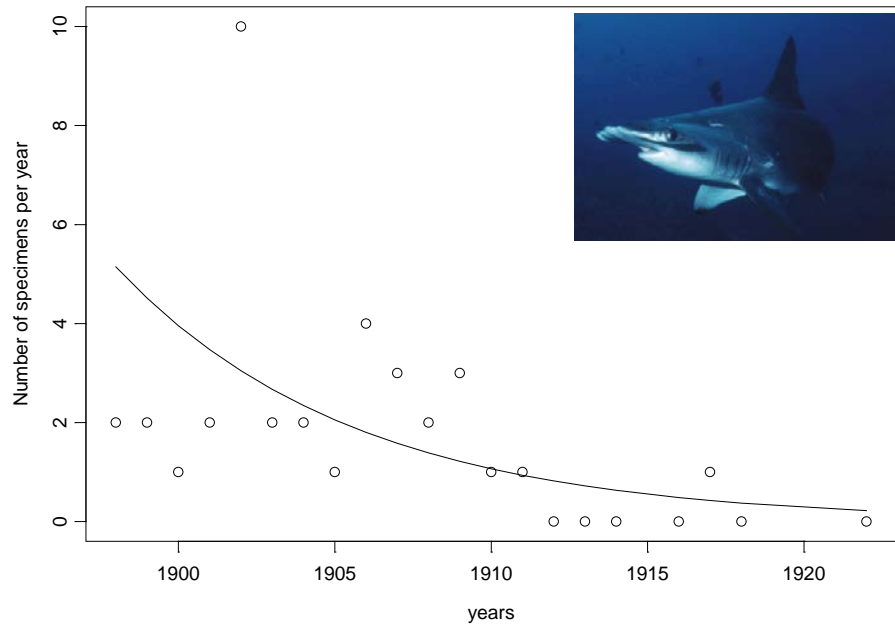
Thresher shark



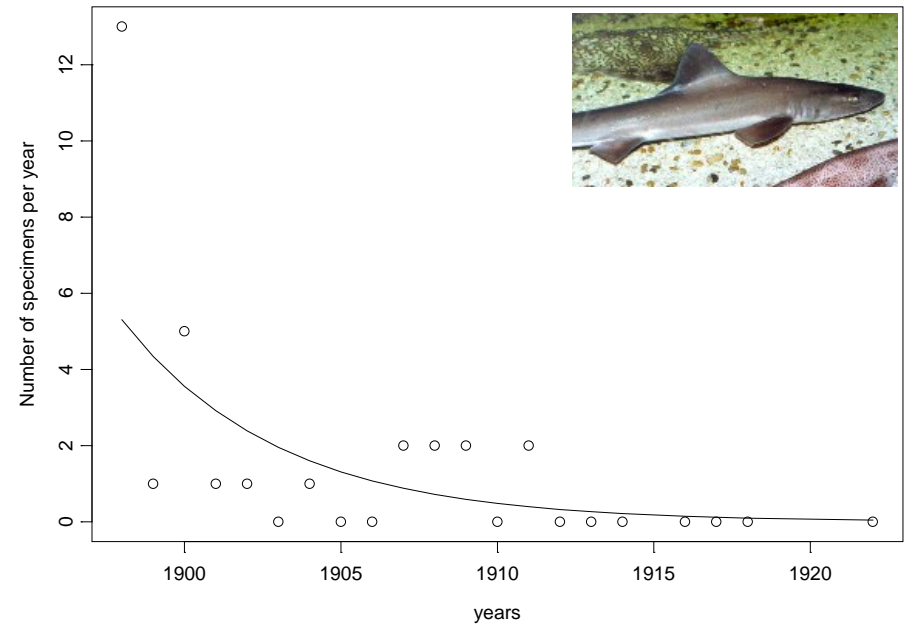
Sixgill shark



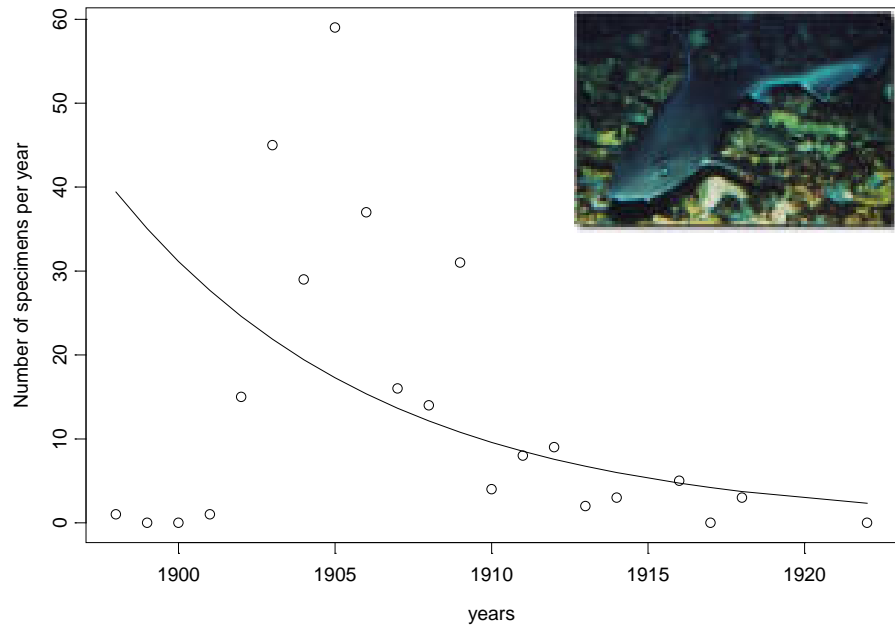
### Hammerhead shark



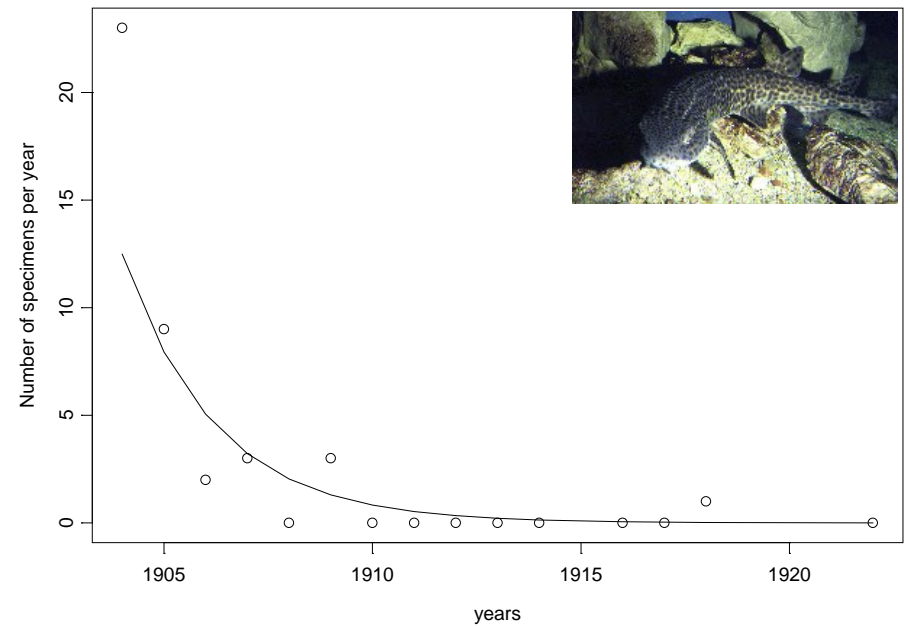
### Smooth-hound



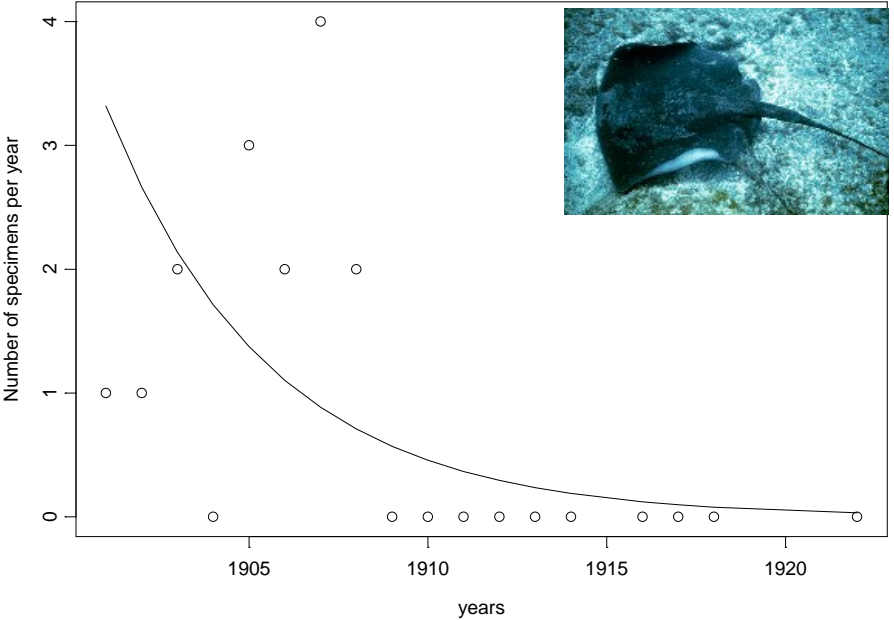
### Starry smooth-hound



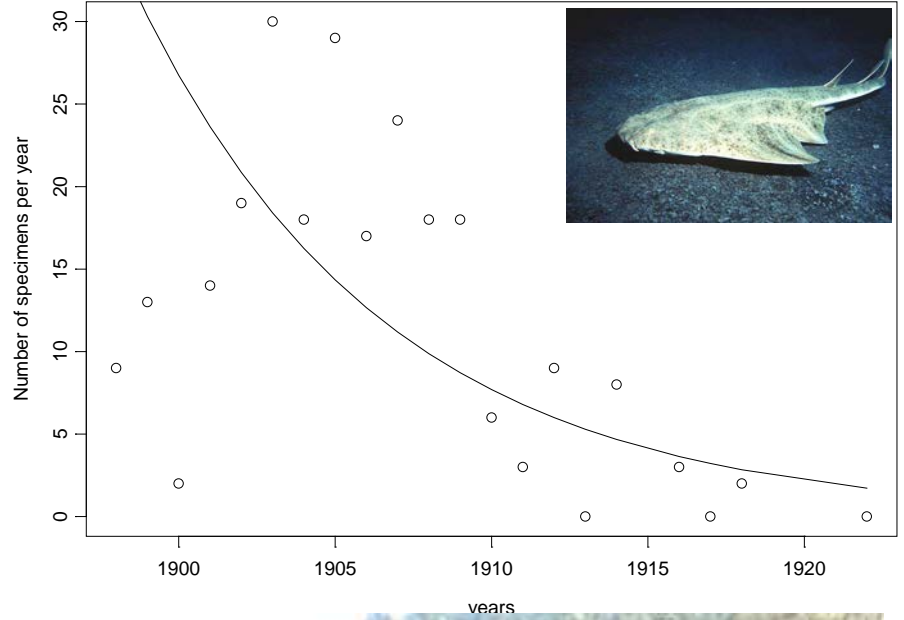
### Nursehound



### Stingrays



### Angel shark



### School shark

