

Biological Monitoring Program for the Atlantic Coast of New Jersey

Fish



Surf Zone



Offshore

Potential Impacts to Surf Zone Fishes

- Habitat shift (partial burial of groins)
 - Change in fish assemblage composition or distribution relative to groins
- Physical Impacts (e.g., turbidity)
 - Evidence of fish mortality or morbidity
 - Decline in fish abundance in the nourished area
- Reduced benthic prey availability
 - Reduced prey biomass in stomachs
 - Reduced foraging efficiency
 - Shift in prey composition



0 1 2 3 Kilometers



Station Locations



Substation Locations

14

A
B
C

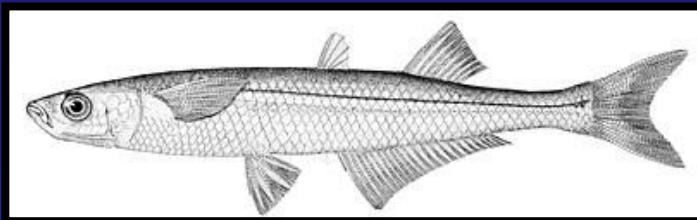




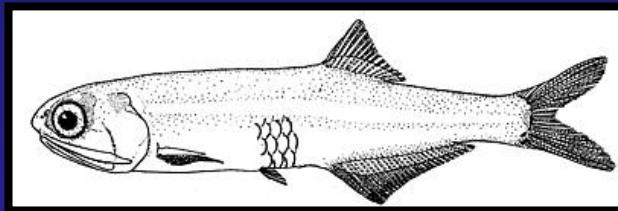
Surf Zone Seine Hauls



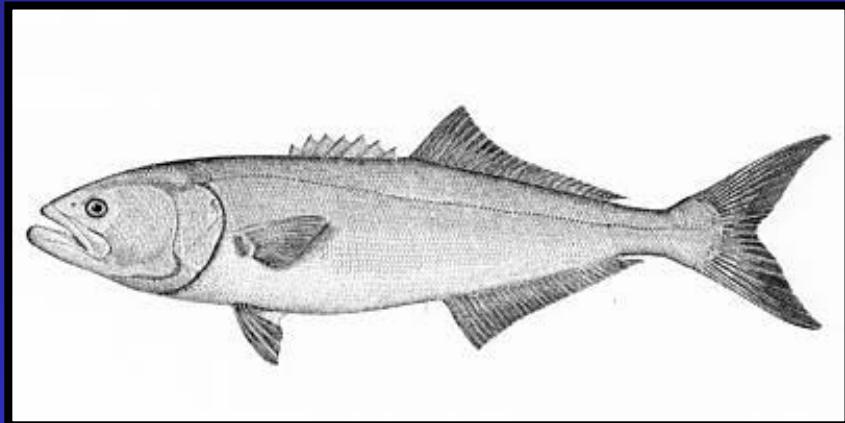
Dominant Surf Zone Fishes



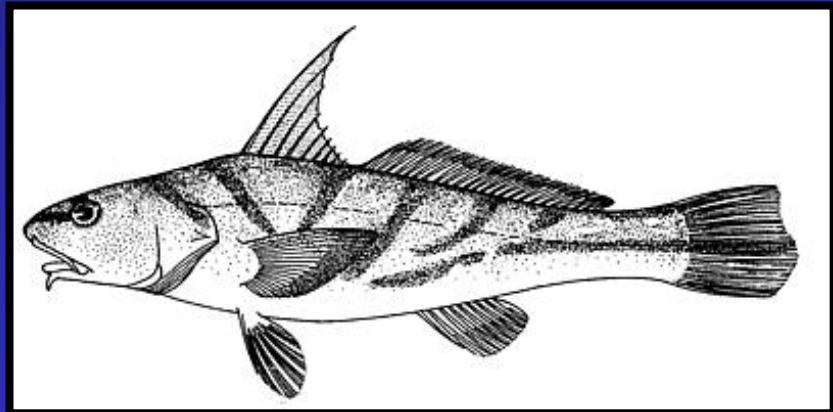
Silversides



Anchovies

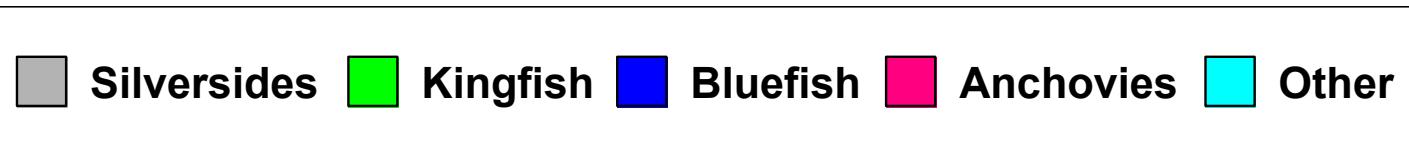


Bluefish

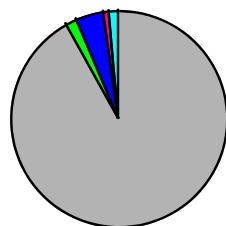


Northern Kingfish

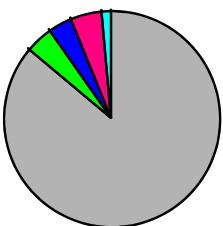
Species Composition



n = 15,390

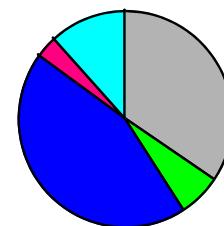


n = 17,647

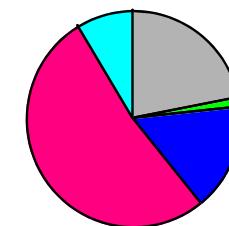


R 1995 BN

n = 28,064

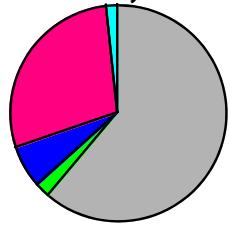


n = 45,696

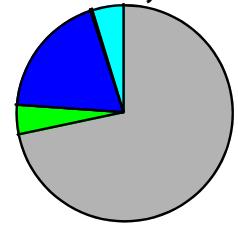


R 1998 BN

n = 29,546

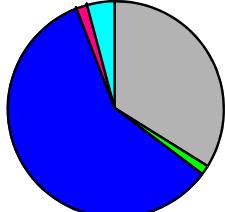


n = 10,138

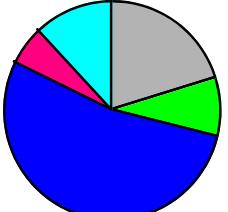


R 1996 BN

n = 43,952

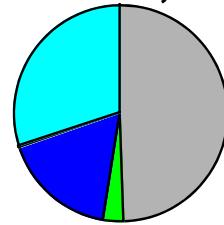


n = 23,402

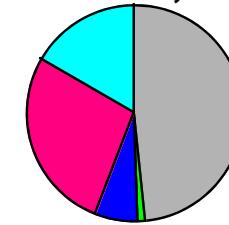


R 1997 BN

n = 21,662



n = 60,811



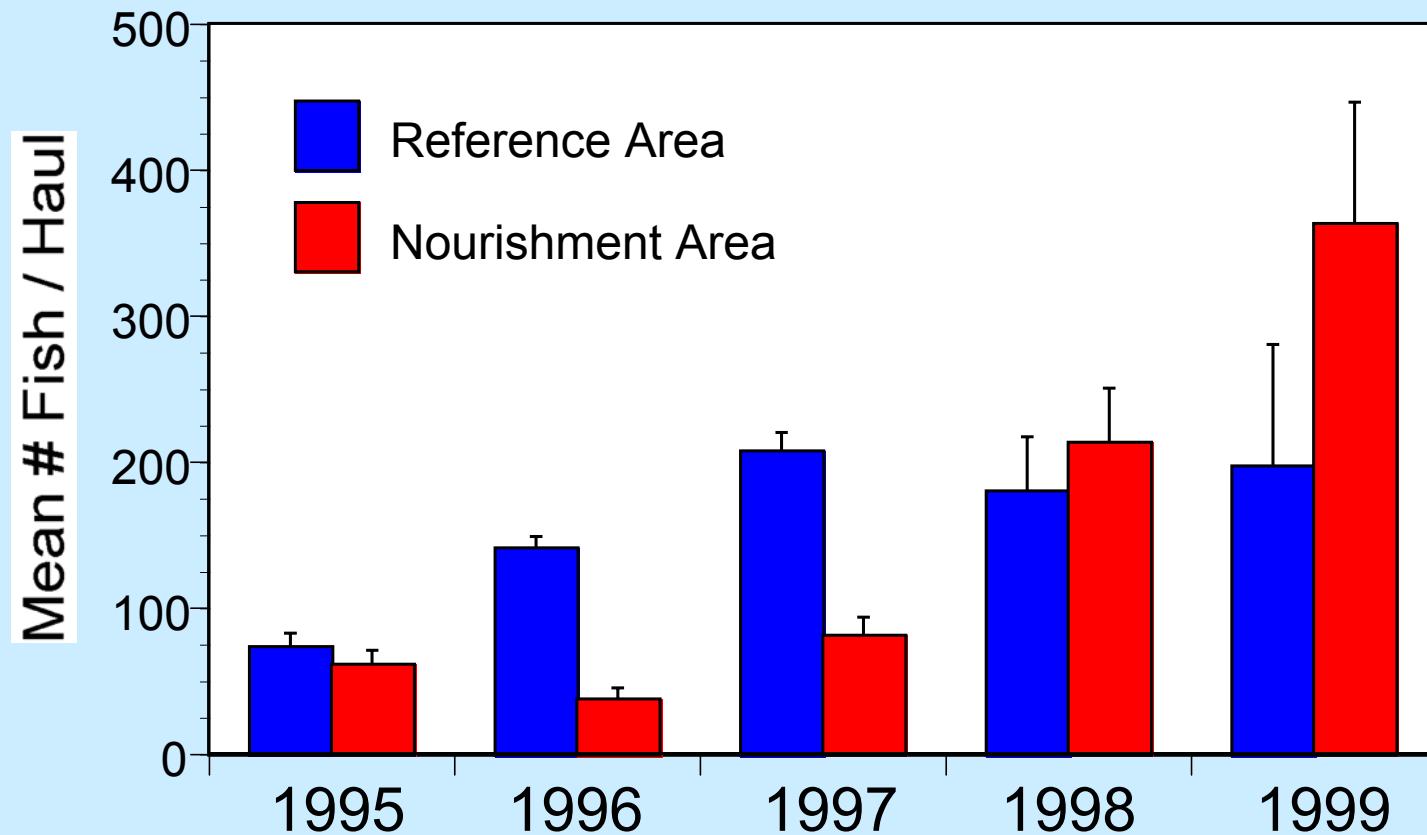
R 1999 BN

Baseline

Nourishment

Post-Nourishment

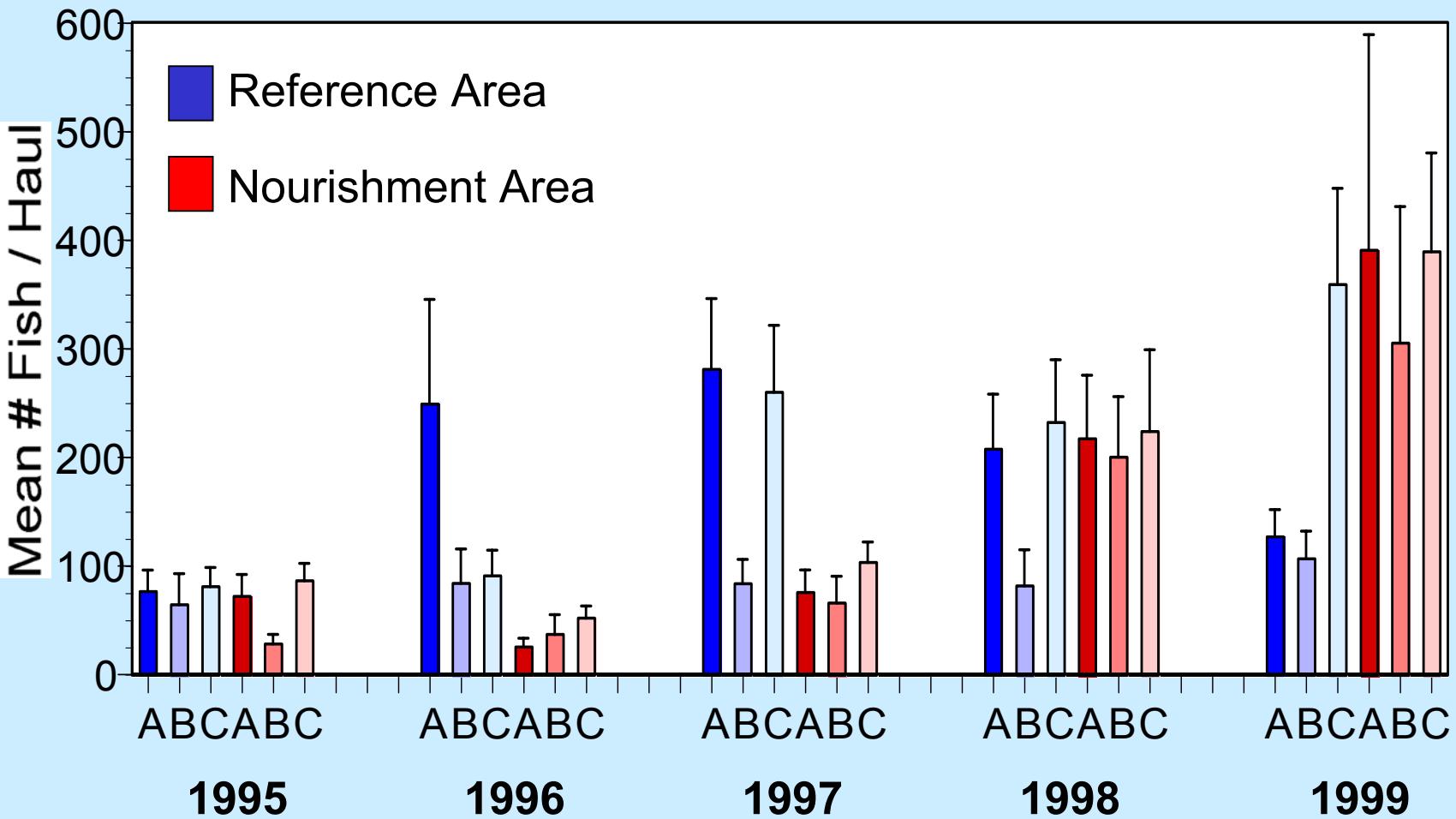
Fish Abundance



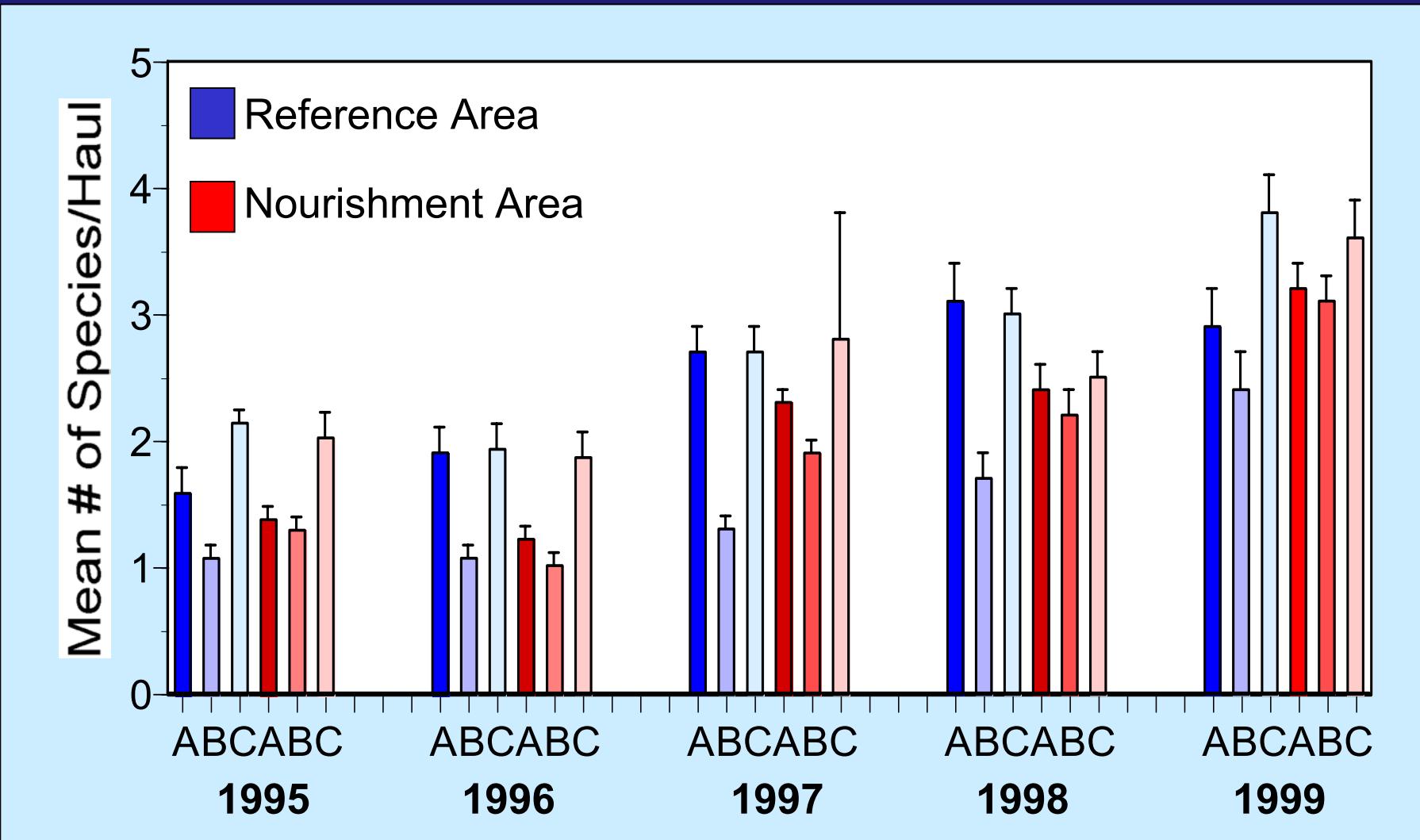
Potential Impacts to Surf Zone Fishes

- Habitat shift (partial burial of groins)
Change in fish distribution relative to groins

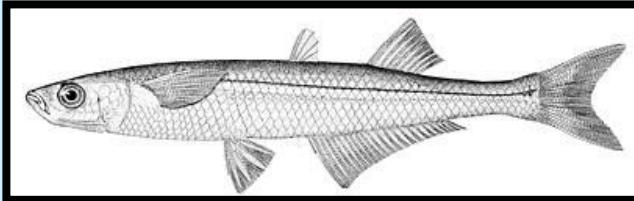
Annual Fish Abundance Relative to Groin Habitat



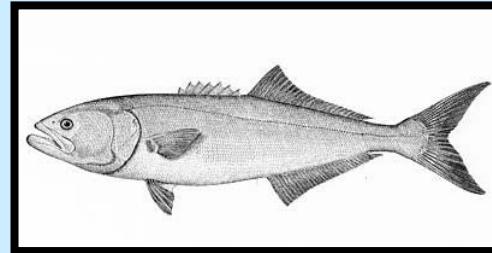
Annual Species Richness Relative to Groin Habitat



Concentrated at Groins

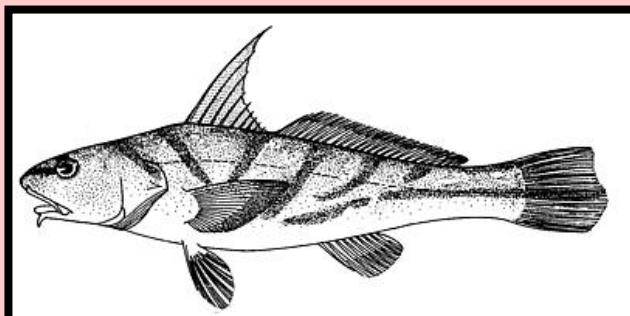


Silversides



Bluefish

Not Concentrated at Groins



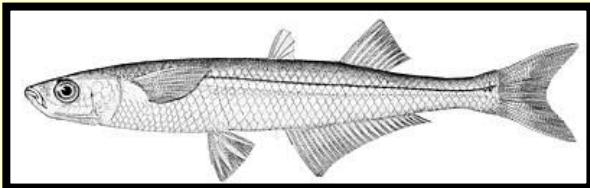
Northern Kingfish

Potential Impacts to Surf Zone Fishes

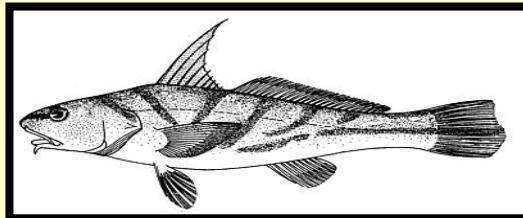
- Physical impacts (e.g., turbidity)

No evidence of fish mortality or morbidity

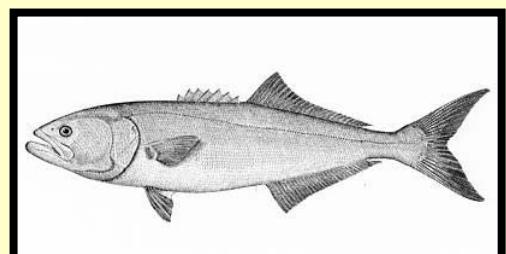
Change in fish distribution relative to
nourished area



Silversides



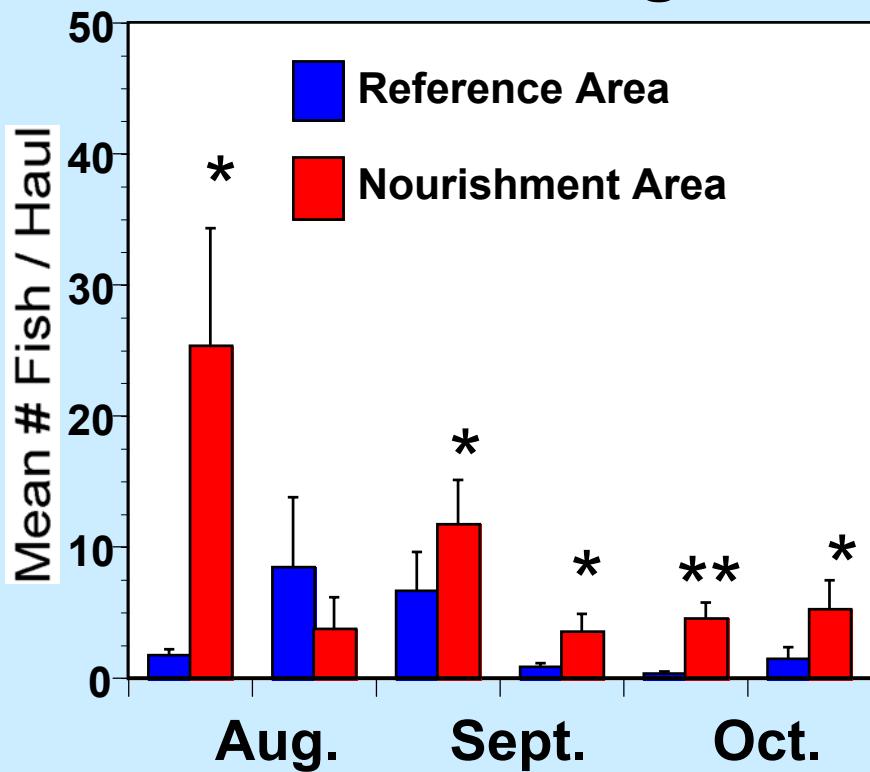
Northern Kingfish



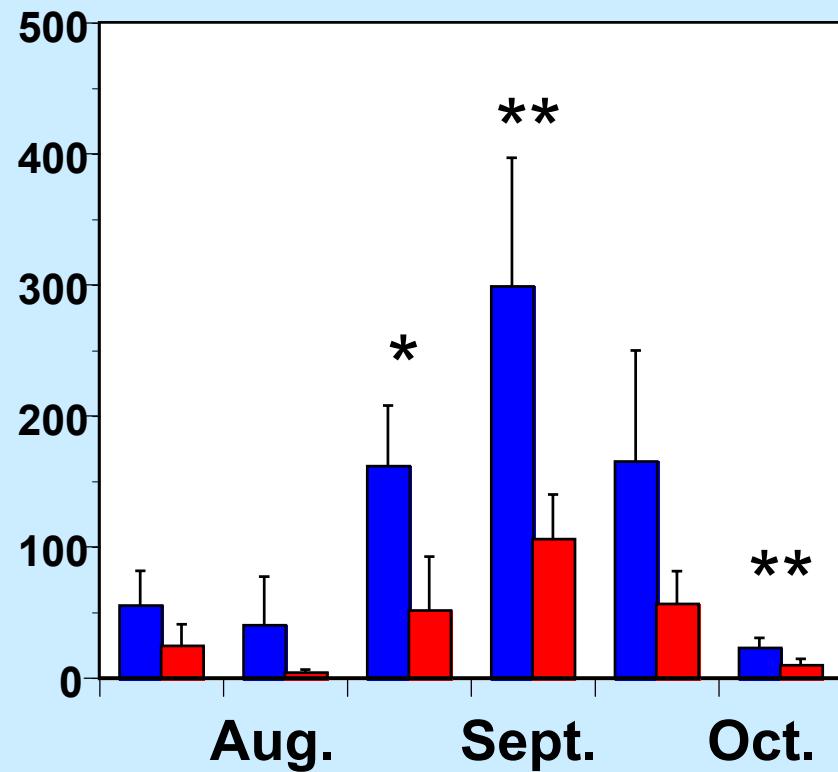
Bluefish

Fish Abundance - 1997

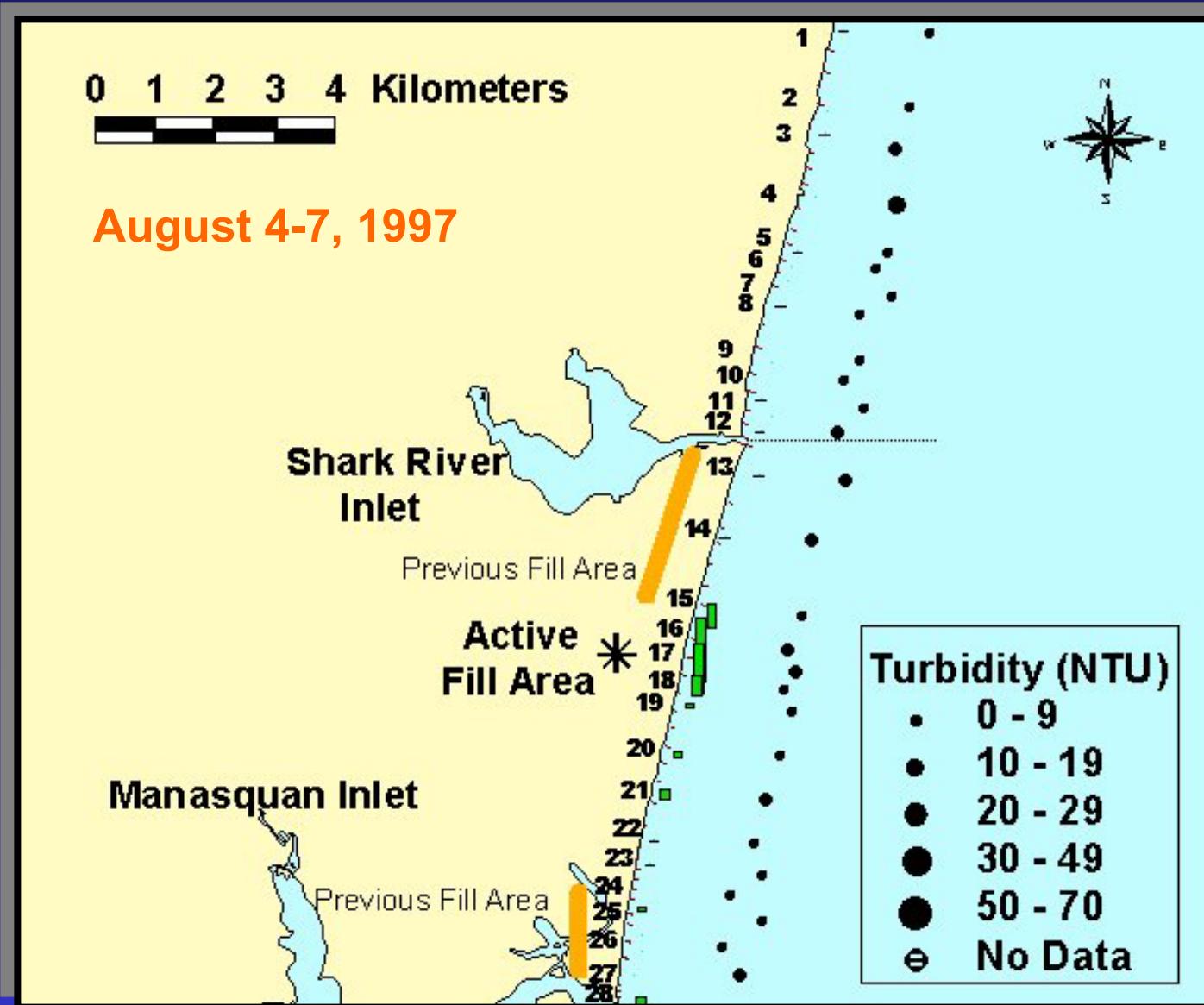
Northern Kingfish



Bluefish



Northern Kingfish Near Fill Area

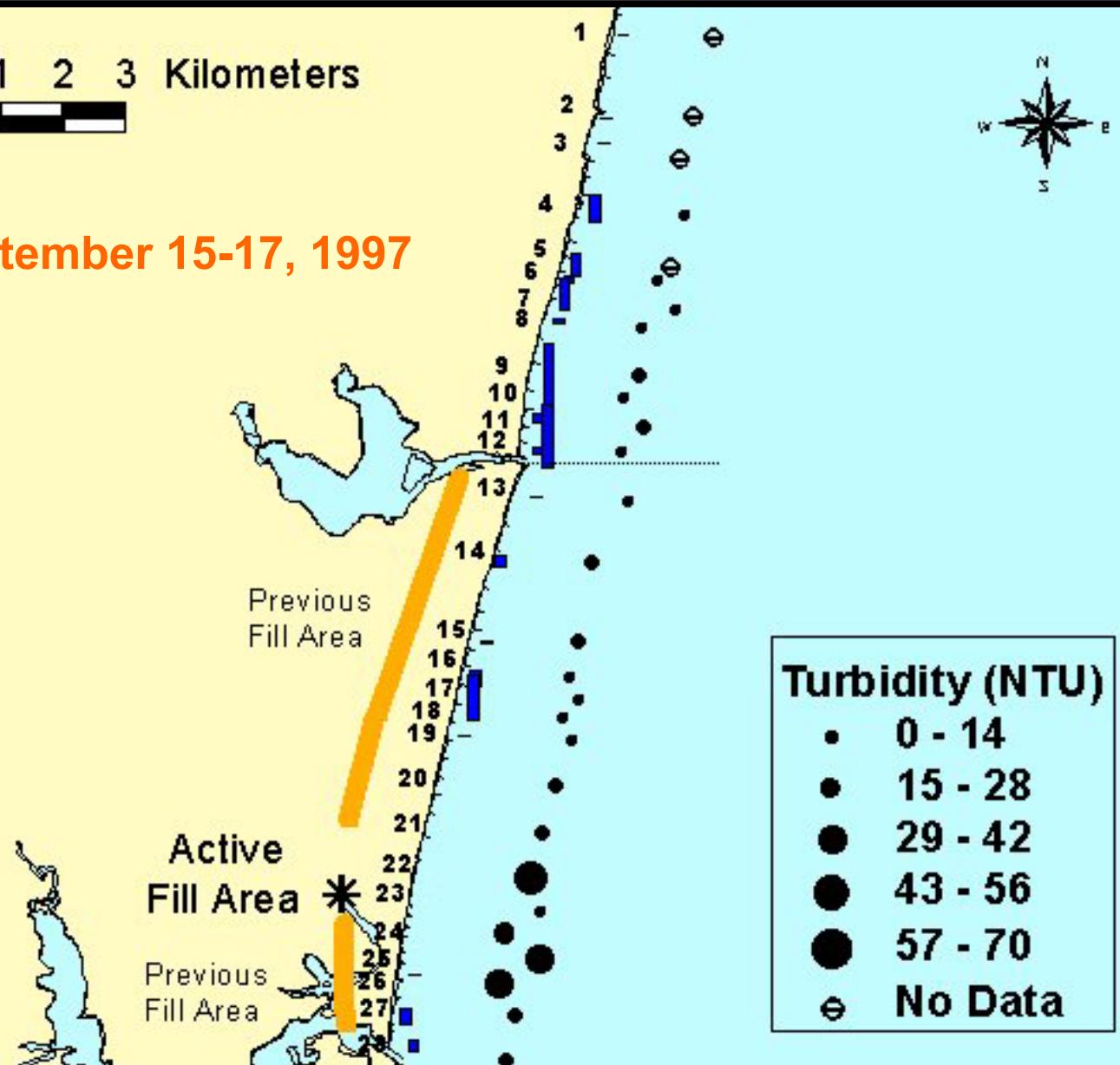


Bluefish Avoid Fill Area

0 1 2 3 Kilometers



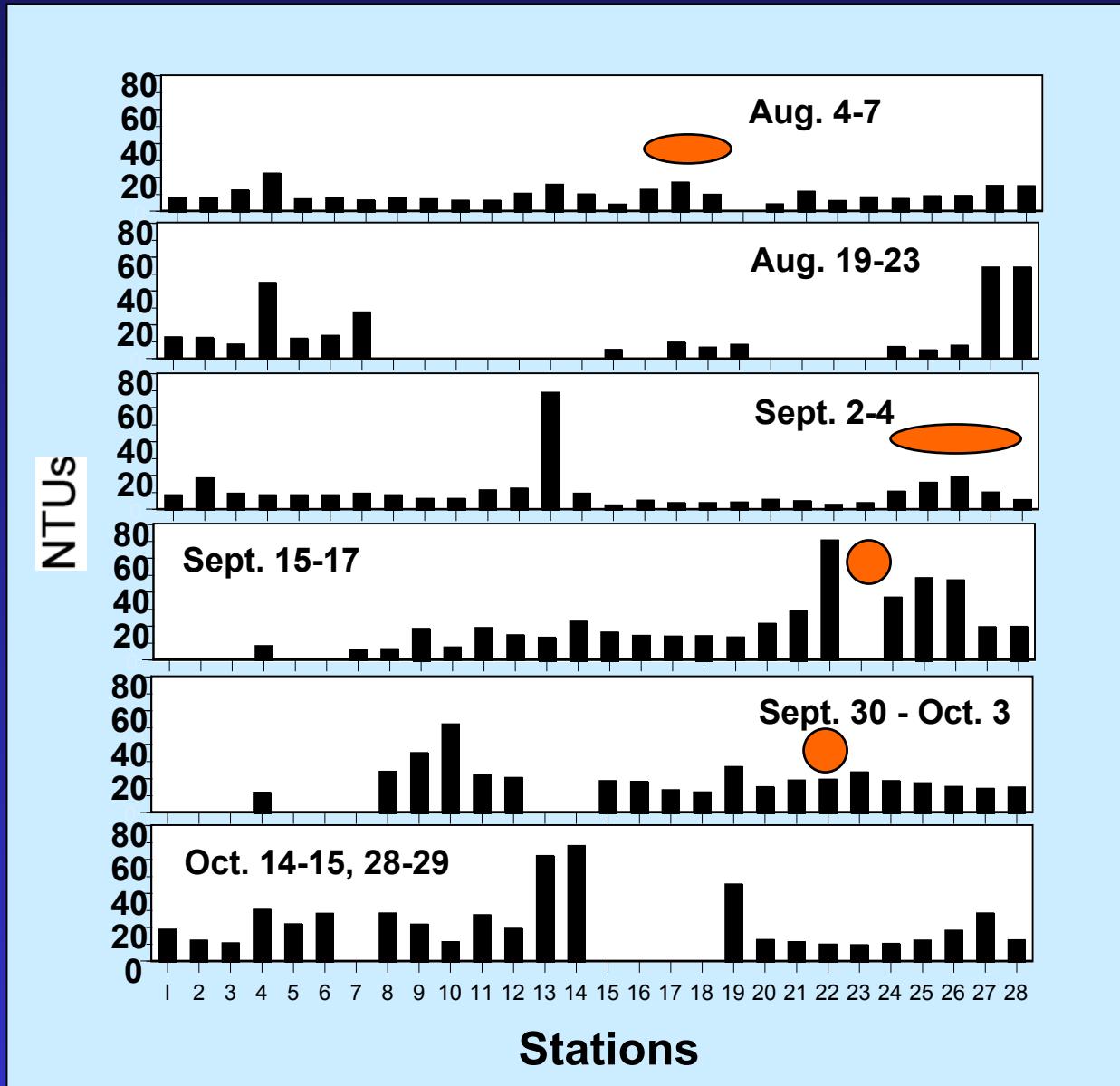
September 15-17, 1997



Turbidity 1997



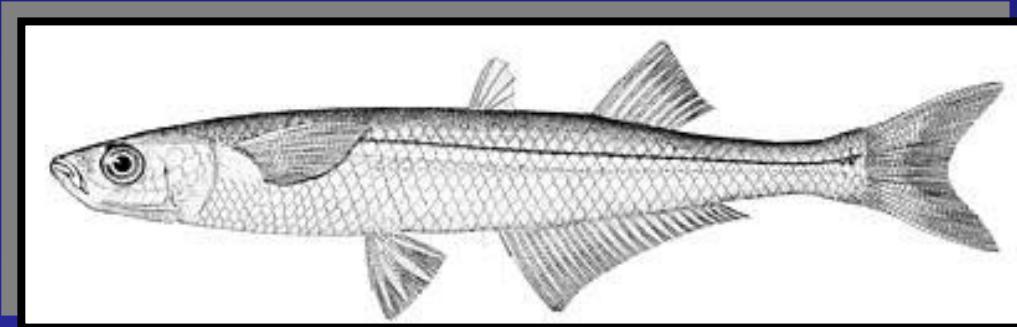
Site of Active
Beach Nourishment



Fish Food Habits

Silversides

(Menidia menidia & Membras martinica)



Northern Kingfish
(Menticirrhus saxatilis)



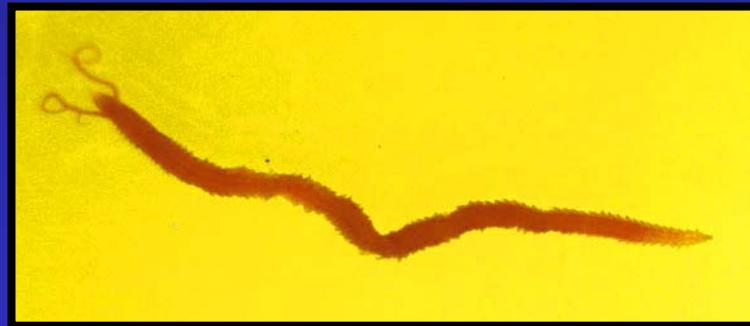
Intertidal Infauna



Mole Crab (*Emerita talpoida*)

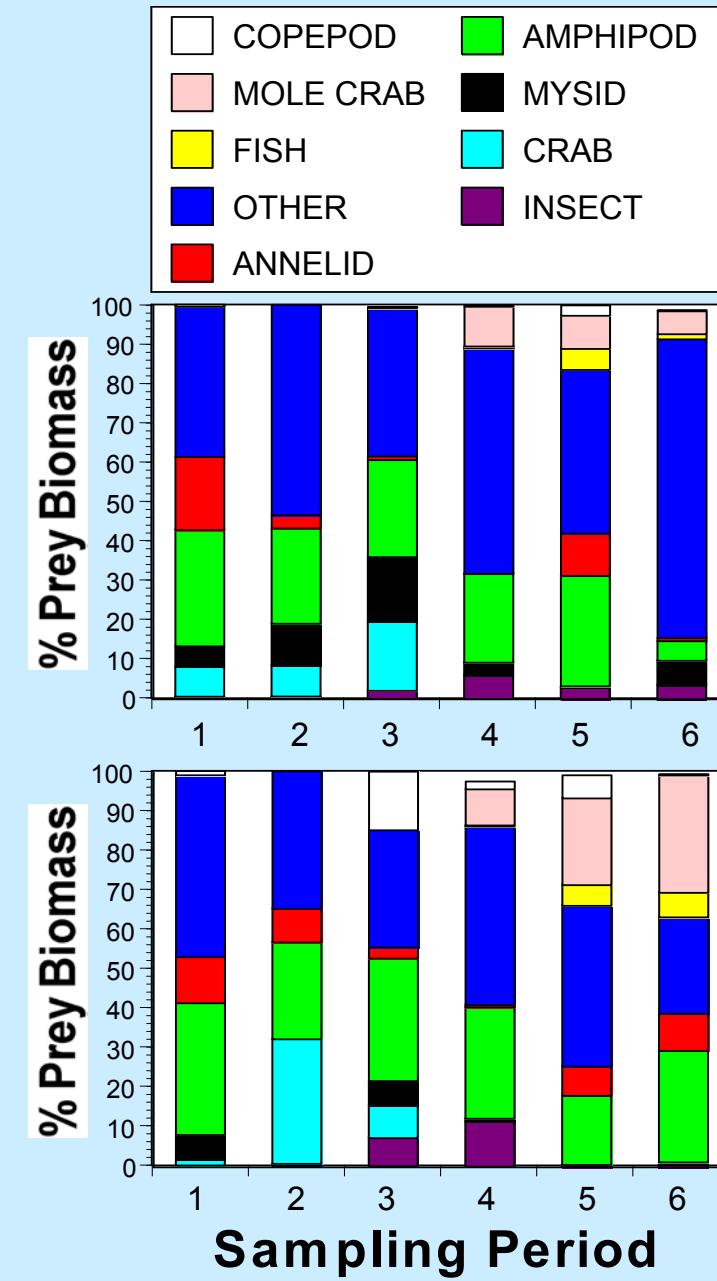
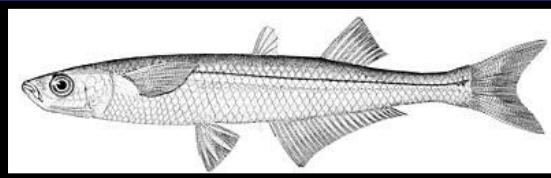


Amphipod (*Jassa sp.*)

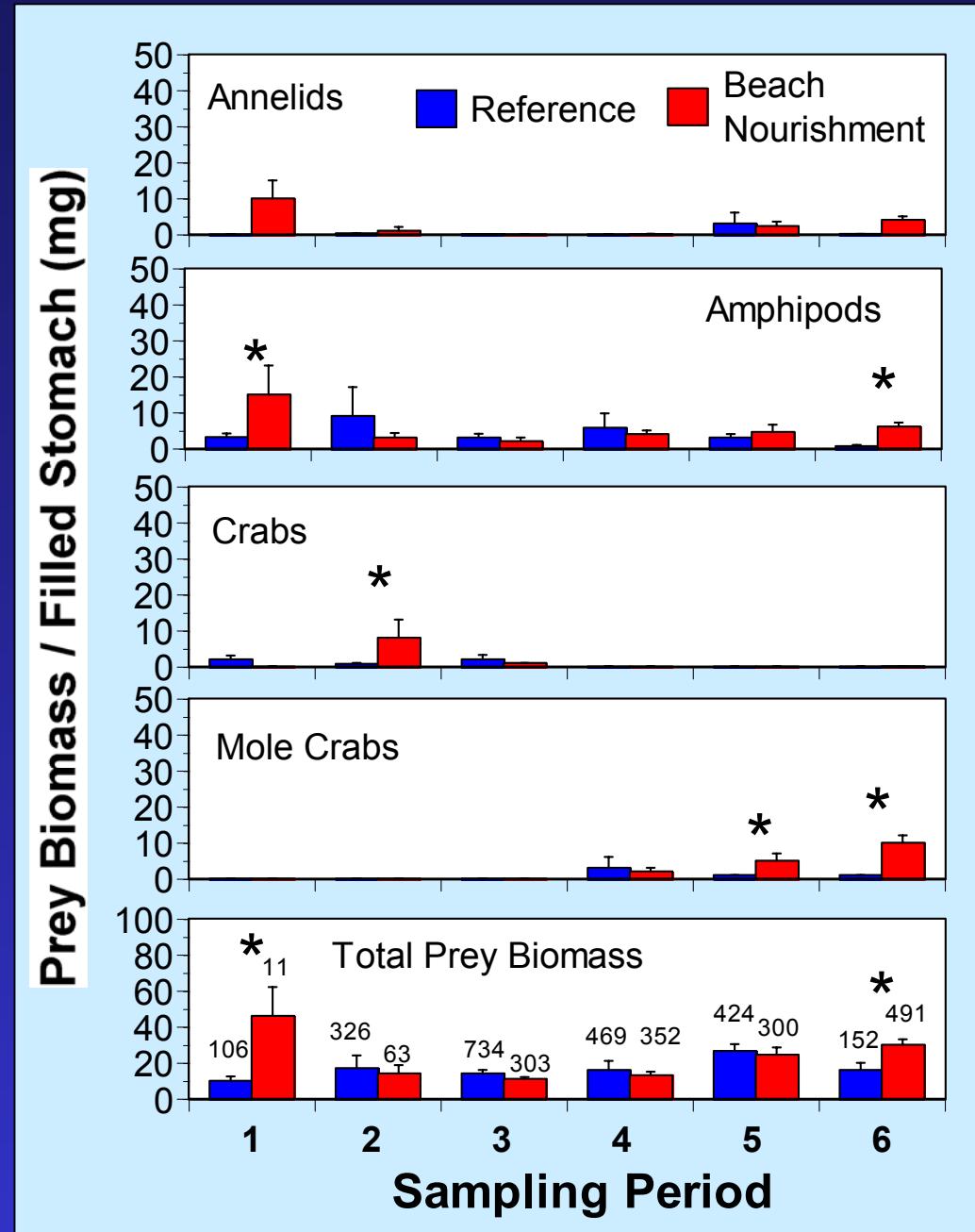
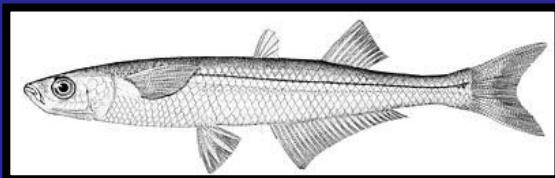


Polychaete (*Scolelepis squamata*)

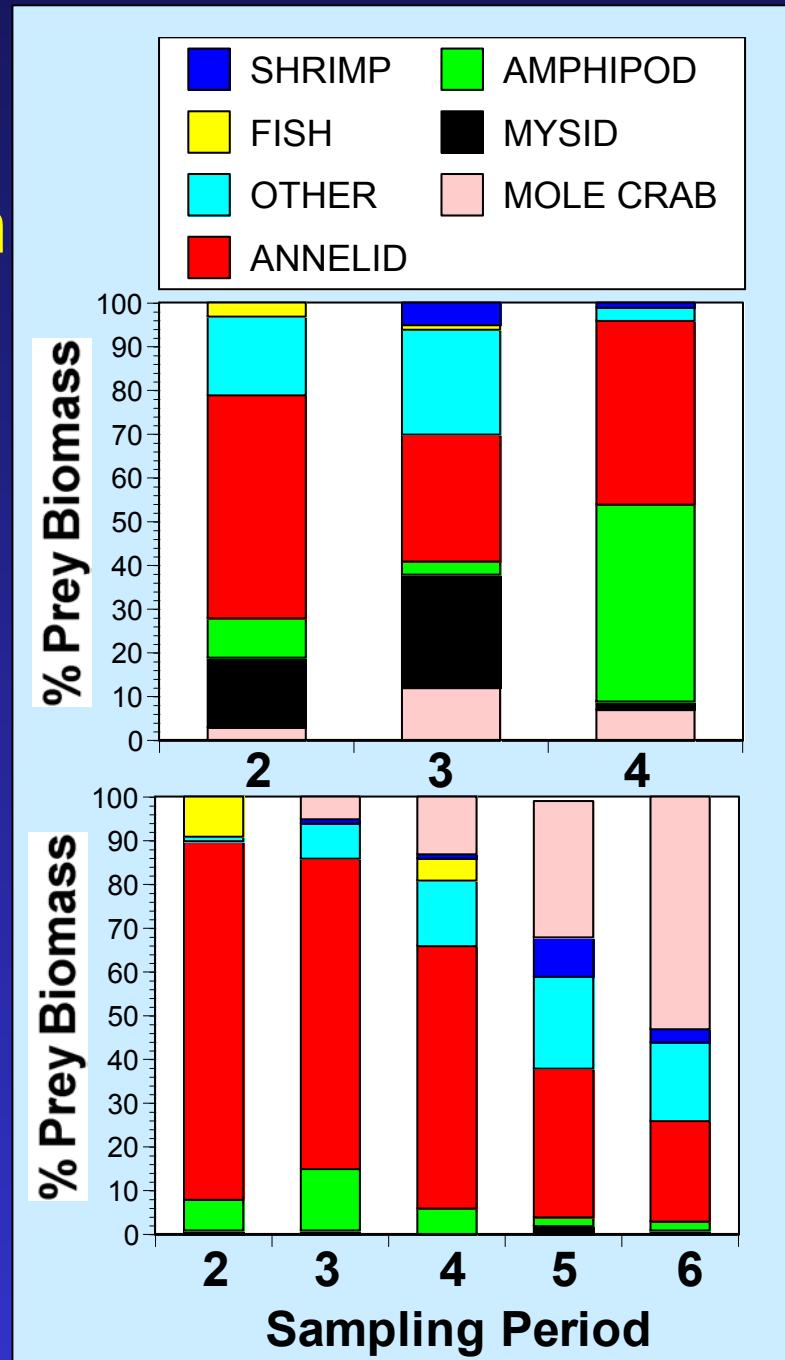
Atlantic Silversides Food Habits 1997



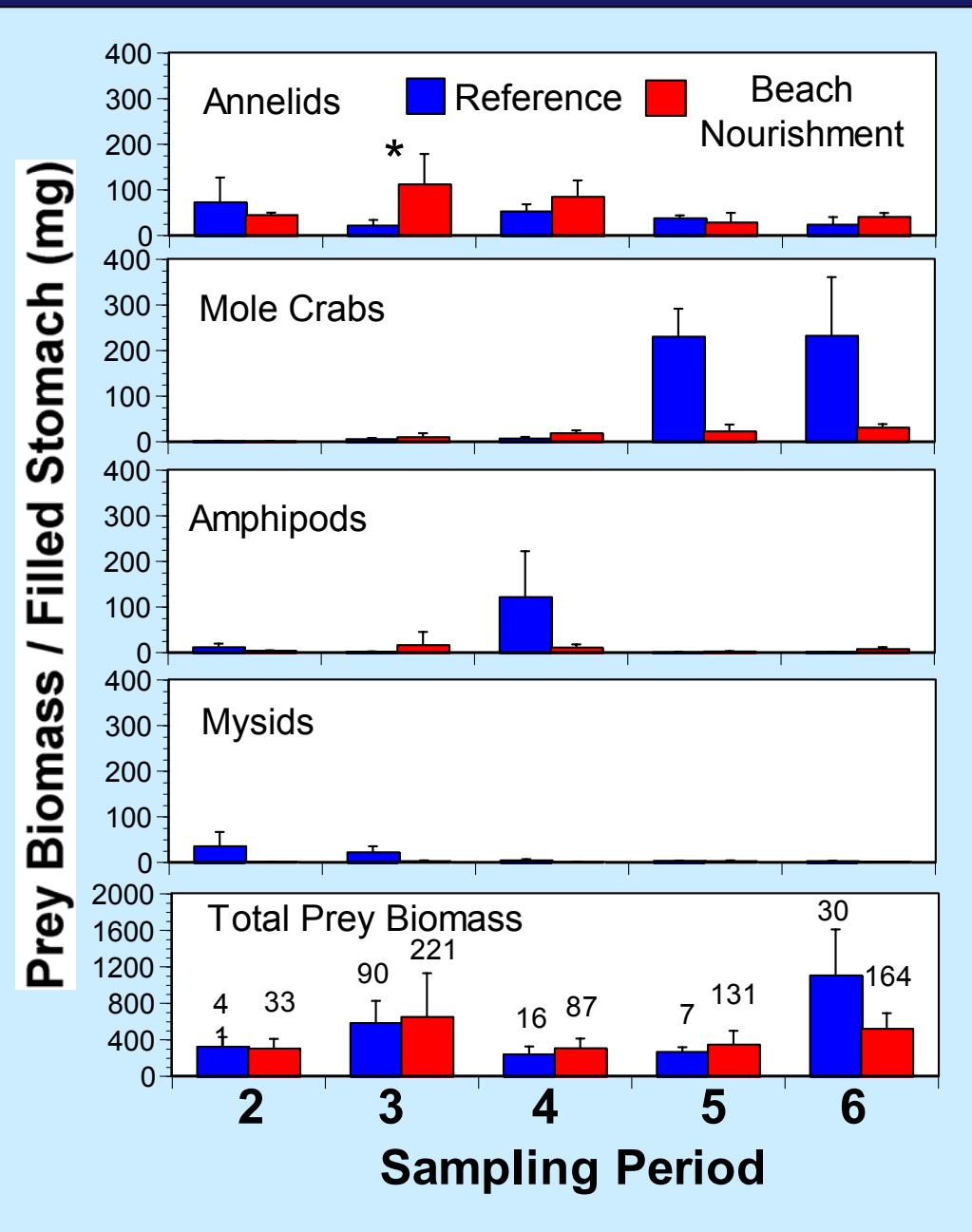
Atlantic Silversides Prey Biomass 1997



Northern Kingfish Food Habits 1997



Northern Kingfish Prey Biomass 1997



Prey Biomass Results - 1997

Stomach contents of fish captured at Beach Nourishment stations relative to fish captured at Reference stations

Taxa	1	2	3	4	5	6
Kingfish	No Data	> Annelids	ns	ns	ns	ns
Atlantic Silversides	> Prey Biomass > Amphipods	> Crabs	ns	ns	>Mole crabs	>Mole Crabs >Amphipods > Prey Biomass

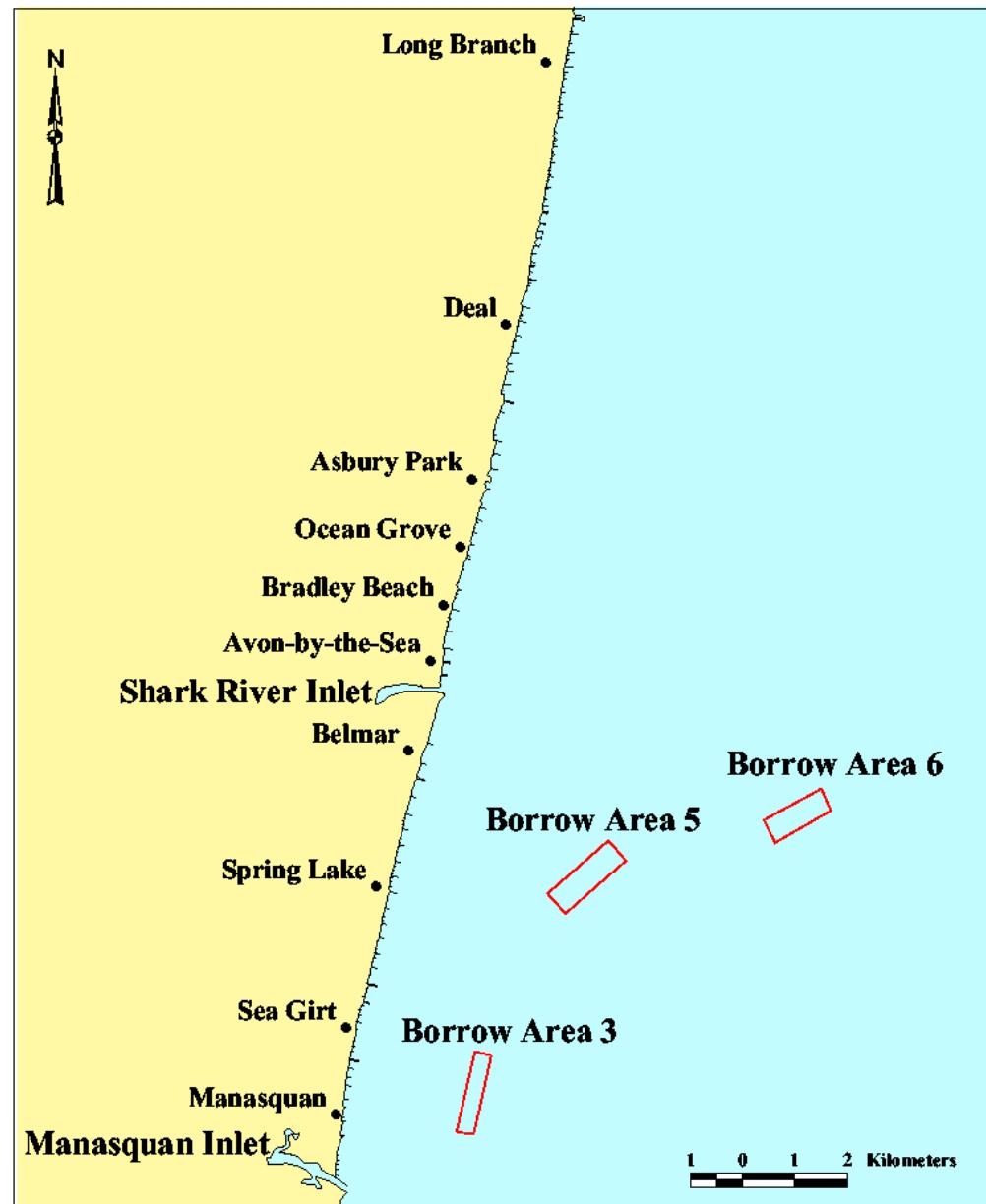
Summary of Impact Assessment On Surf Zone Fishes

- ★ Fish abundance and species richness higher near rock groins
- ★ Northern kingfish attracted to nourishment area
- ★ Bluefish avoid nourishment area
- ★ Fish food habits similar in fish from beach nourishment and reference areas

Borrow Area Fish Assemblages



Offshore Borrow Area Map



Dominant Bottom-Feeders



Summer Flounder
(*Paralichthys dentatus*)



Winter Flounder
(*Pleuronectes americanus*)



Scup
(*Stenotomus chrysops*)

Offshore Borrow Area Finfish Feeding Habits



Summer Flounder

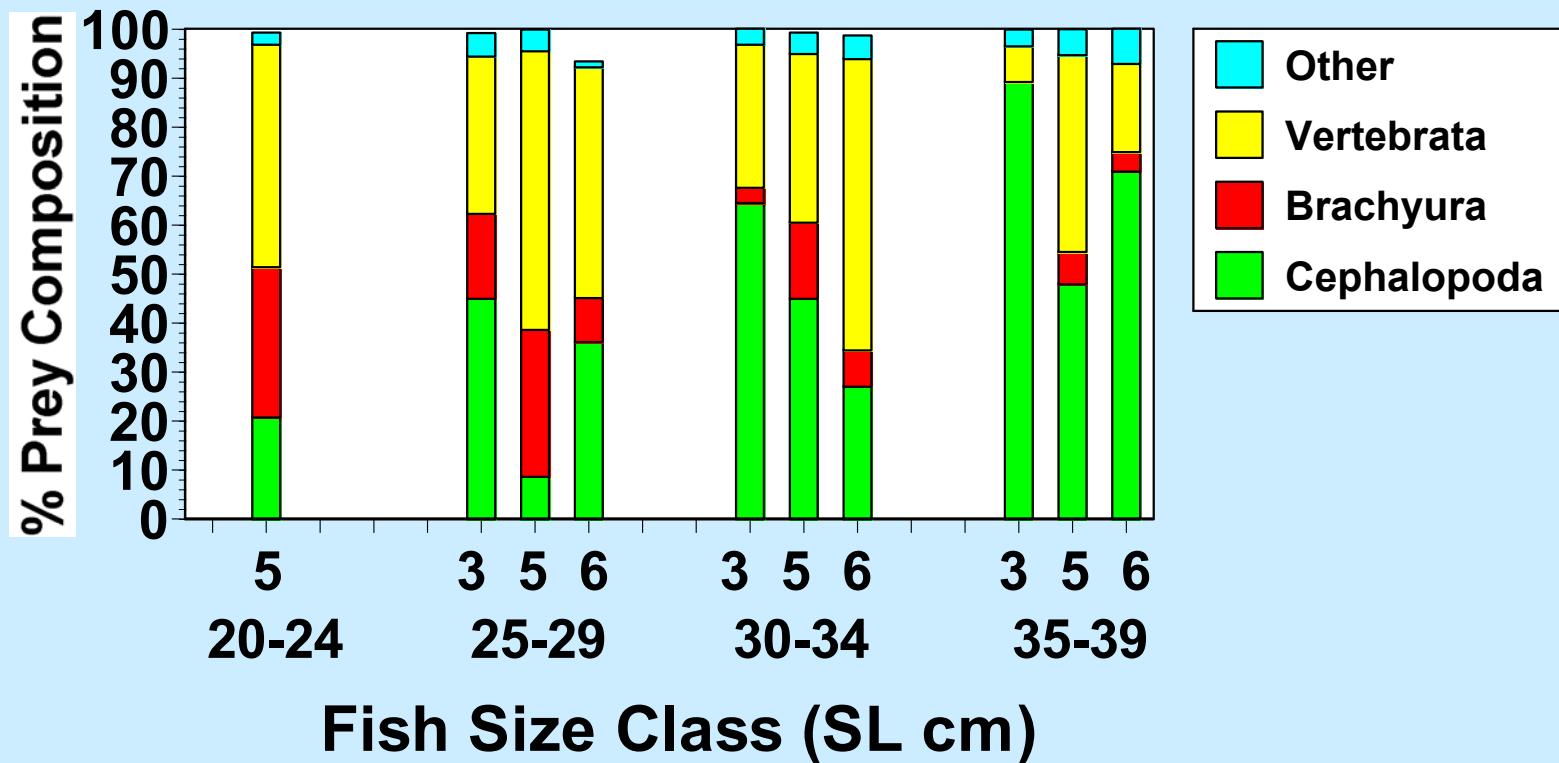
Dominant Food Items

Long Fin
Inshore Squid
(*Loligo pealeii*)



Atlantic Rock Crab
(*Cancer irroratus*)

Summer Flounder - Fall 1997



Winter Flounder & Scup Dominant Food Items



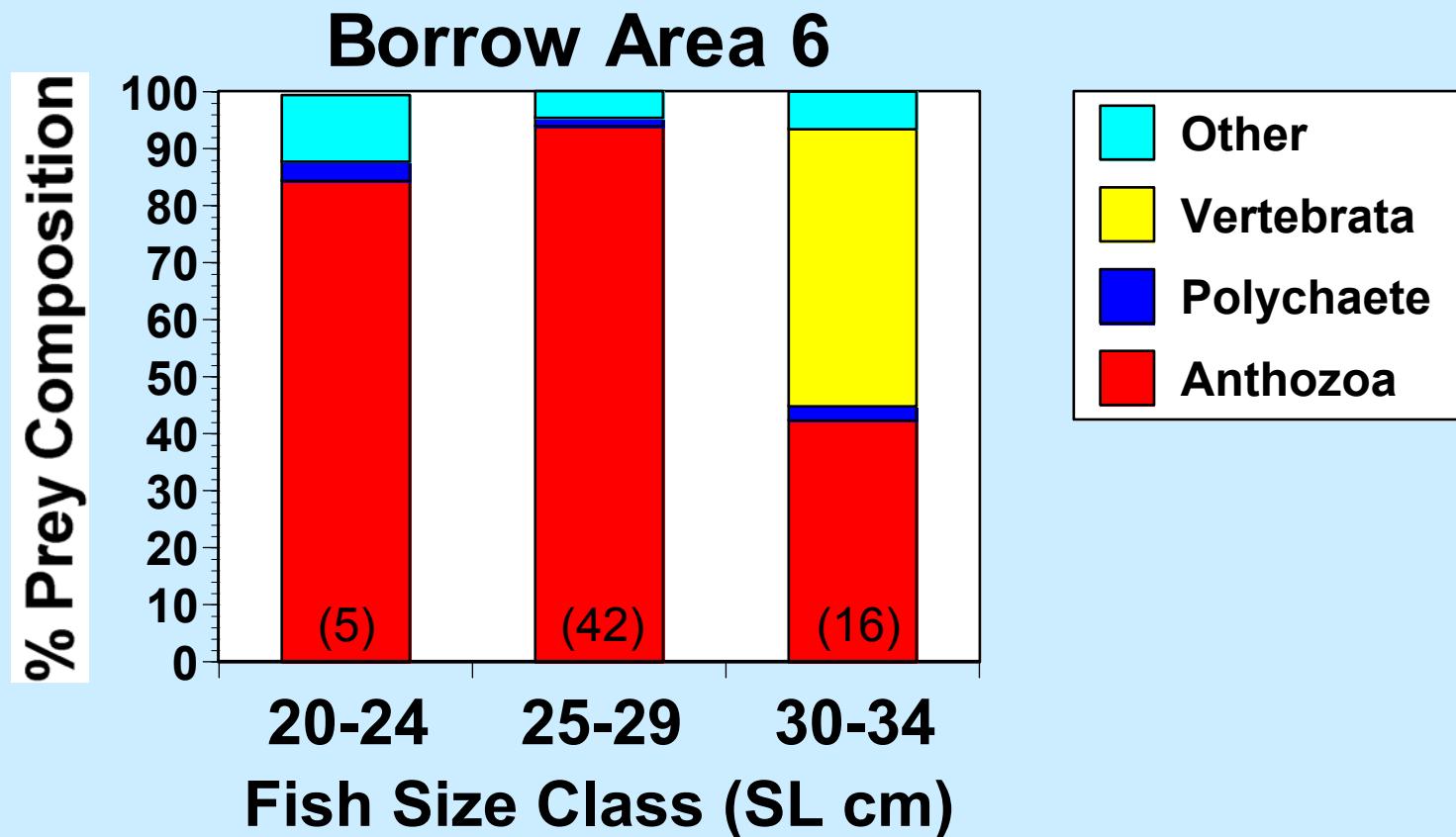
Anemone
*(Cerianthiopsis
americanus)*

**Gammarid
Amphipod**
*(Gammarus
spp.)*



**Lumbrinerid
Polychaete**
(Scoletoma spp)

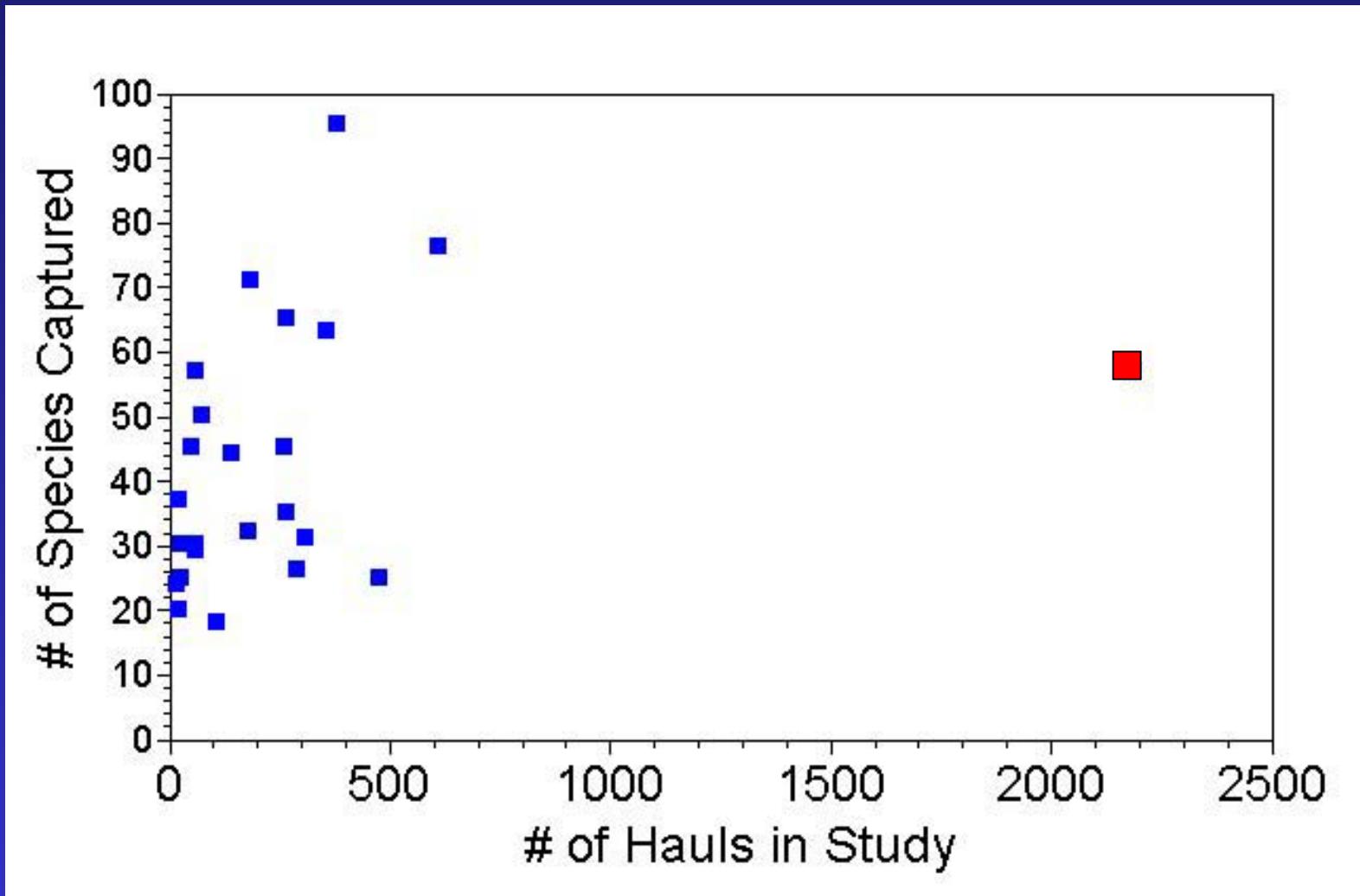
Winter Flounder - Spring 1997



Offshore Borrow Area Finfish Feeding Habits

- ★ Winter flounder fed primarily on polychaetes and anemones
- ★ Anemones in diets indicate fishes are not reliant on borrow areas for trophic support
- ★ Summer flounder diet primarily epibenthos (crabs, shrimp, squid & fishes)
- ★ No major changes in diets after dredging

Comparison of Effort



Return From Sampling Effort

