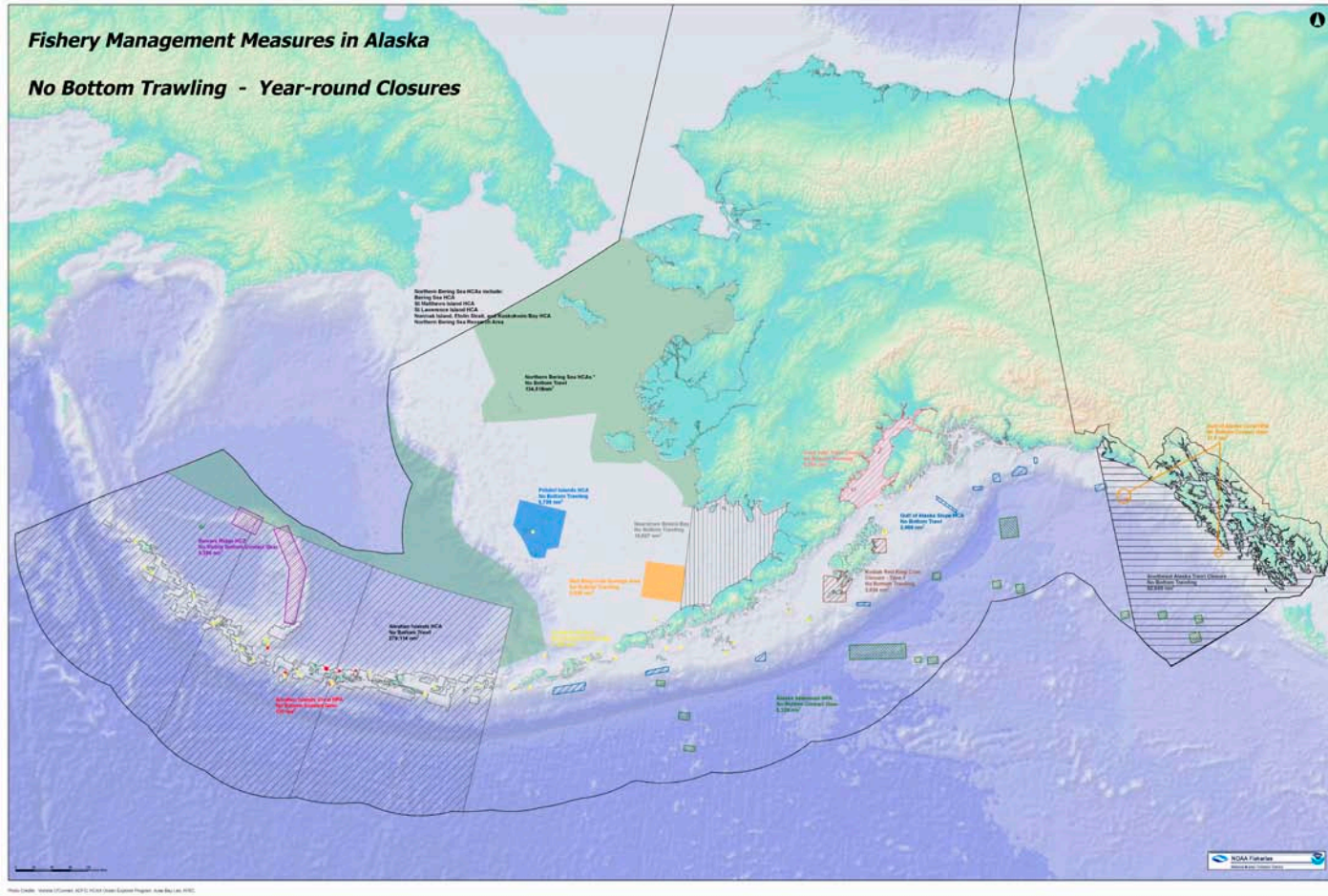


# Fishing industry perspectives on the use of trawl “closed areas” for benthic habitat protection in federally managed fisheries off Alaska

John Gauvin, MS Resource Economics  
Fishery Science Projects Director  
Best Use Cooperative



# Comparing two federal waters habitat protection measures for Aleutian Island and Bering Sea areas



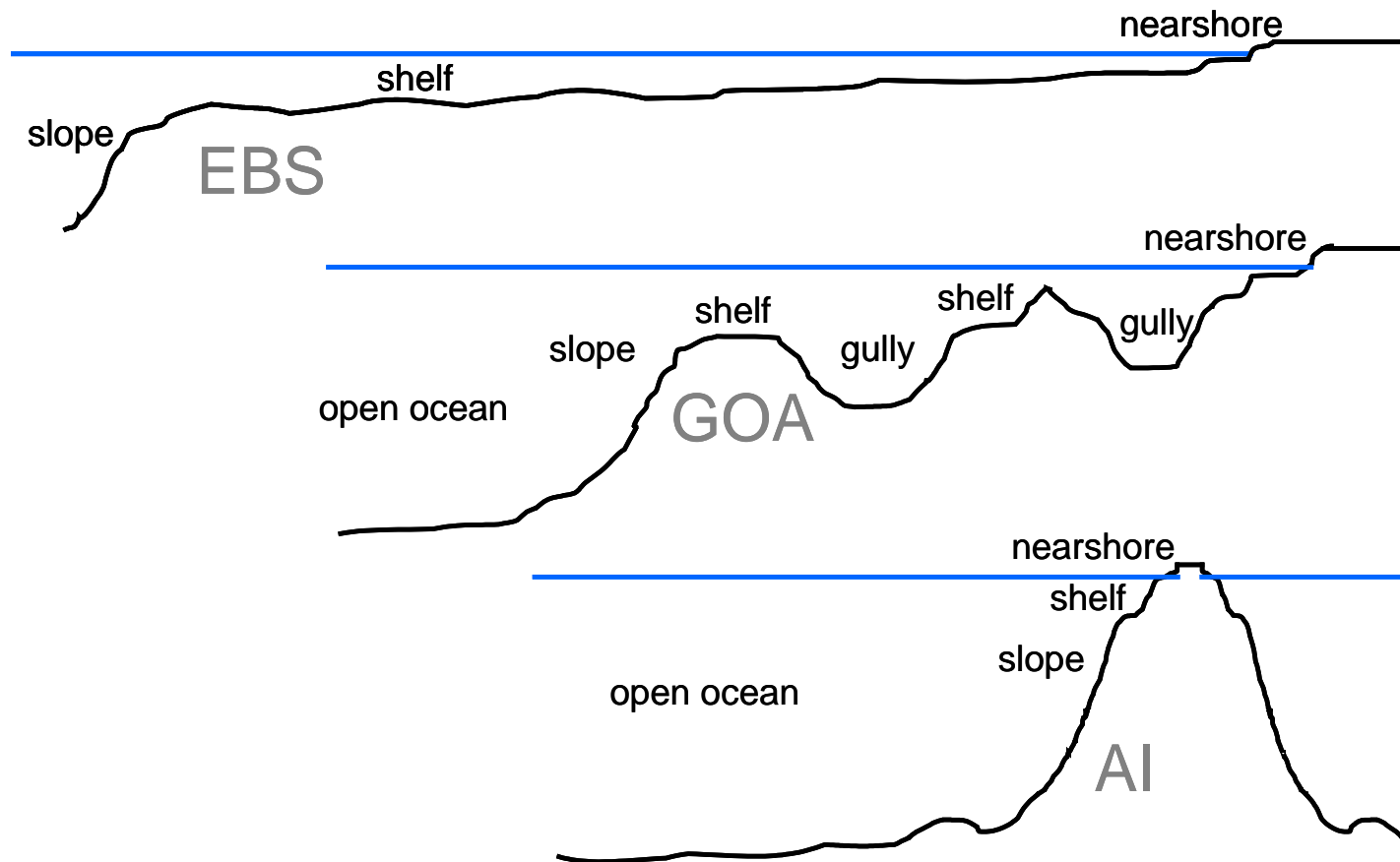
# Main Themes of the Talk

- Trawl Closures and mitigation measures discussed in this talk were constructed to minimize, to the extent practicable, the effects of fishing on EFH (MSFCMA)
- Talk provides examples of how and whys (into the weeds)
- Carefully constructed to balance EFH and other FMP objectives (e.g. yield from fishery, efficiency, minimize bycatch to extent practical)
- Industry and probably NPFMC not too eager to “mix and match”, apply closure to other fisheries, pull in other objectives, expand, round off, generalize the application of habitat protection measures

# Aleutian Islands: Specifics of benthic habitat and AI fisheries

- Rock ledge and volcanic sand bottom, steep bathymetry, deep water coral patches, some gardens/reefs
- Extensive areas that are not trawlable
- Fishing depths => 200 meters (deep compared to Bering Sea shelf)
- Passes and upwelling push nutrients up onto limited shelf and banks
- Fishermen have been trawling the same patchy fishing locations fished every year (volcanic sand and gravel banks) and stock abundance and catch rates have been consistent or increasing since “Americanization”

# Comparison of shelf and slope contours in different management areas



# Deep water coral protection was the focus for Aleutian Island habitat protection measures

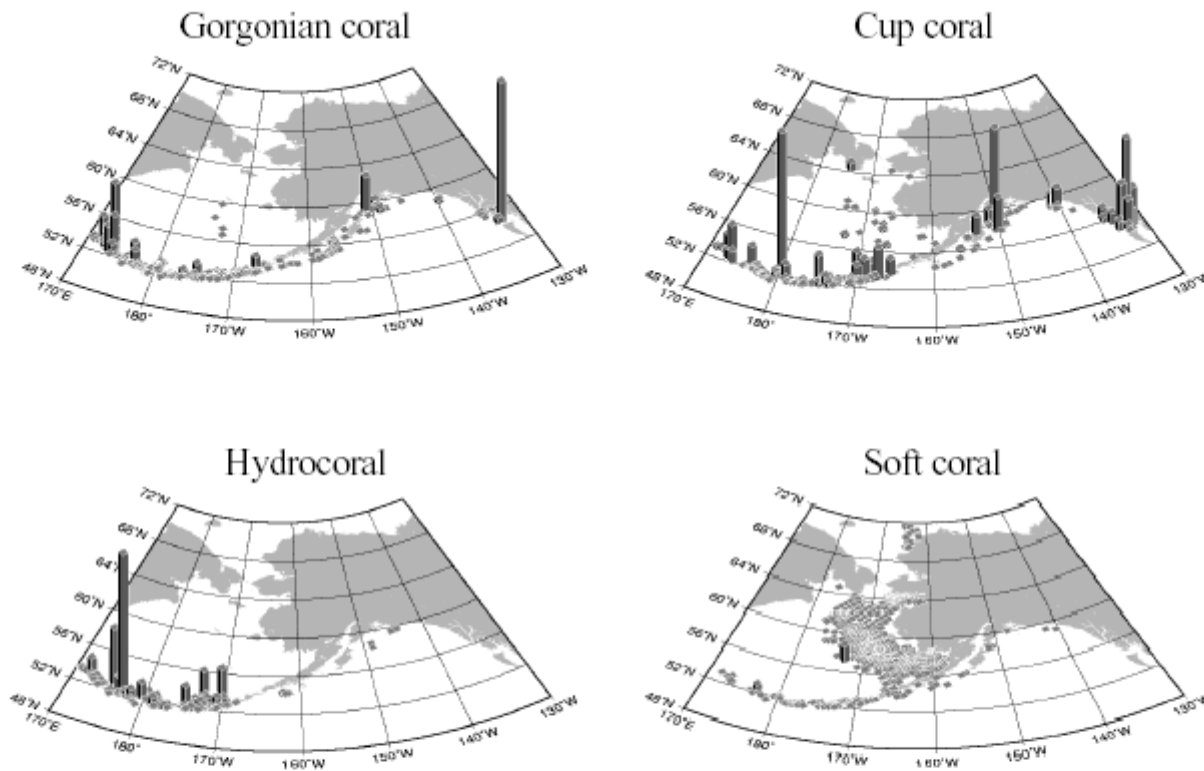
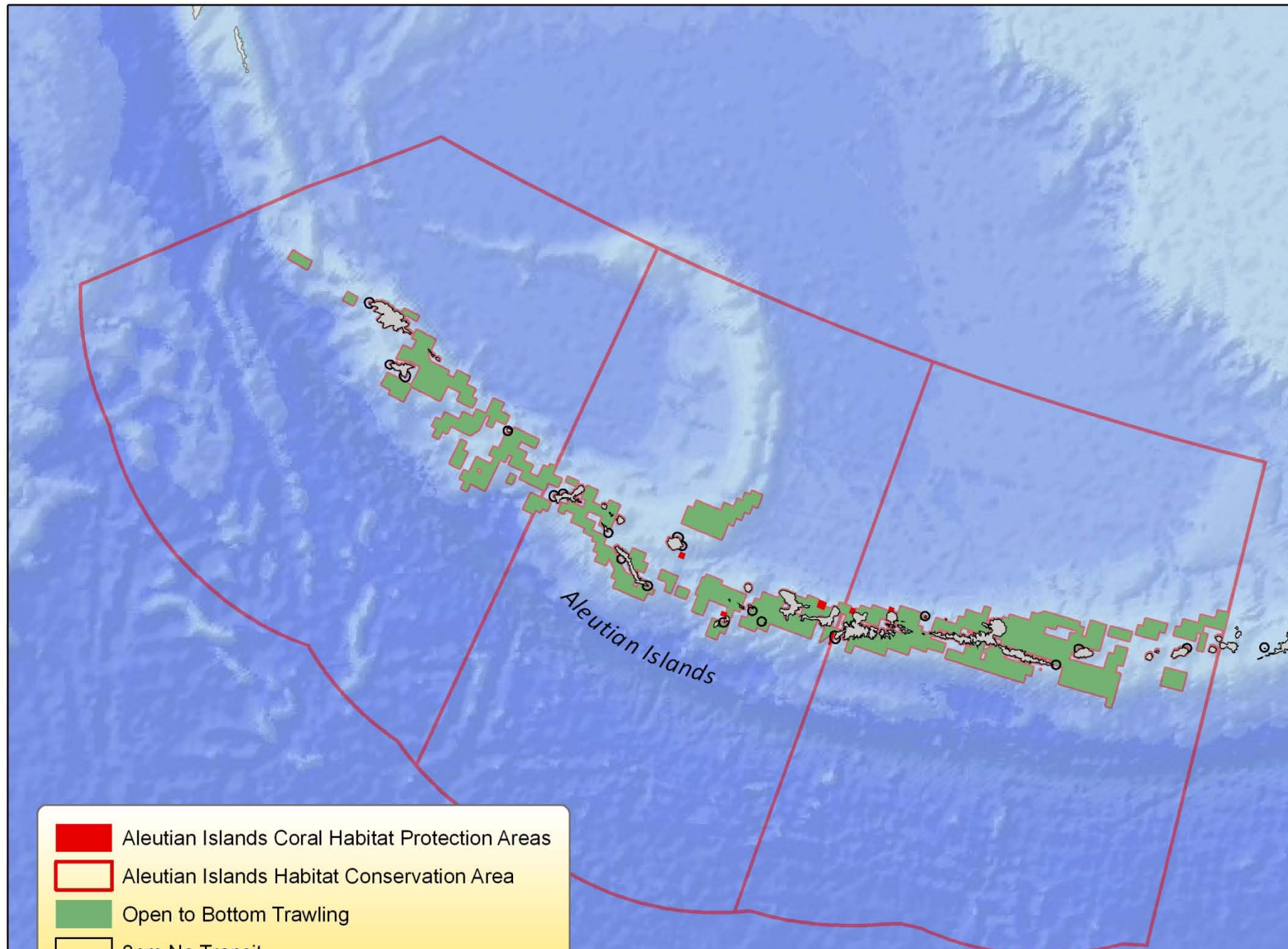


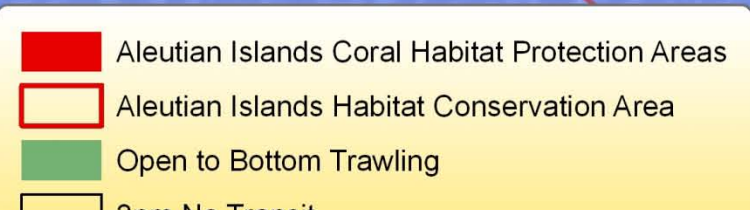
Figure 3. Relative abundance within a taxonomic group of corals off Alaska based on CPUE in NMFS trawl surveys, 1975 - 1998. Within a taxonomic group, CPUE was scaled relative to the largest value.

# Aleutian Islands substrates (rocky outcrop with encrusting and stalked DW corals)

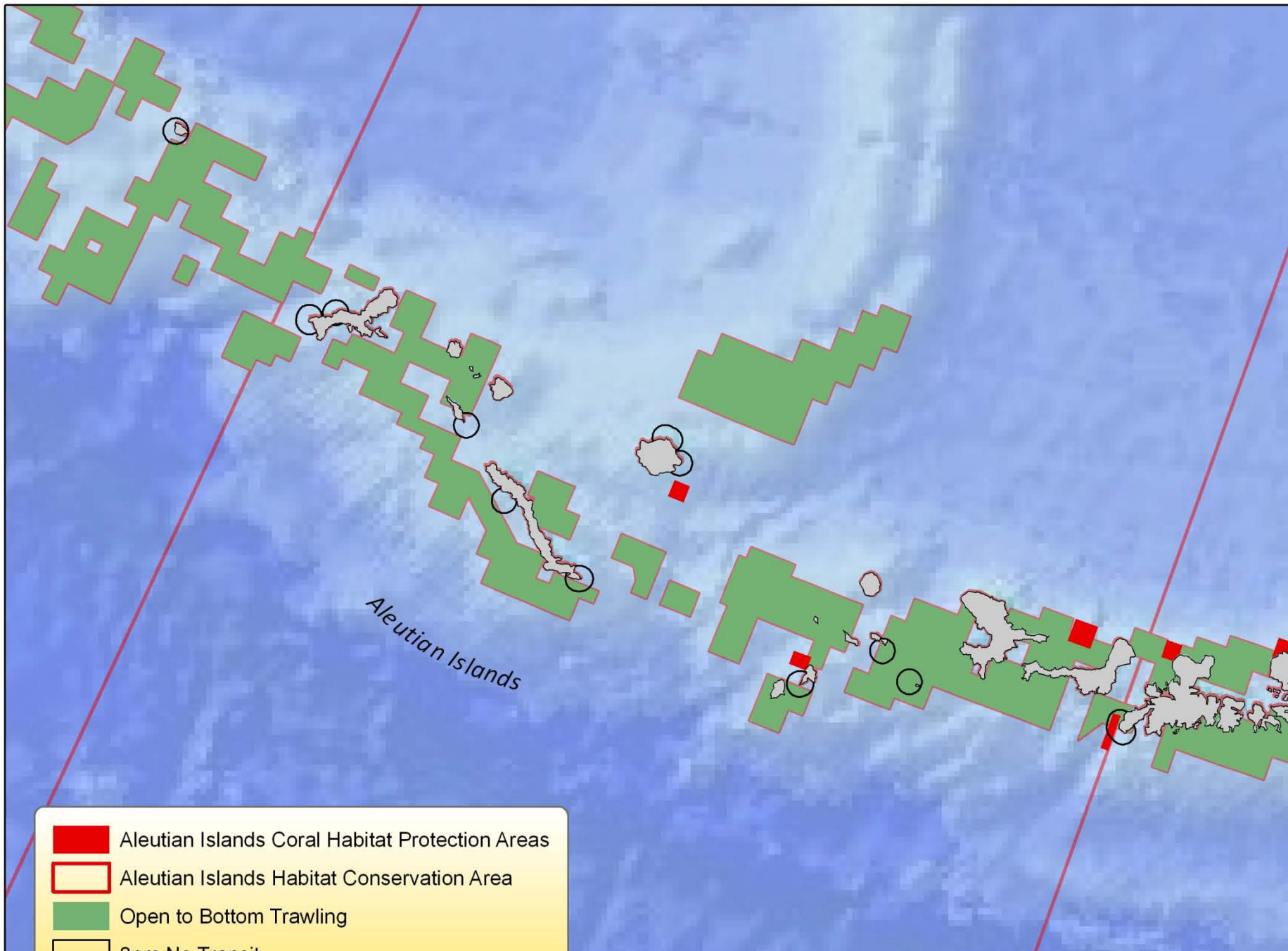




Aleutian Islands





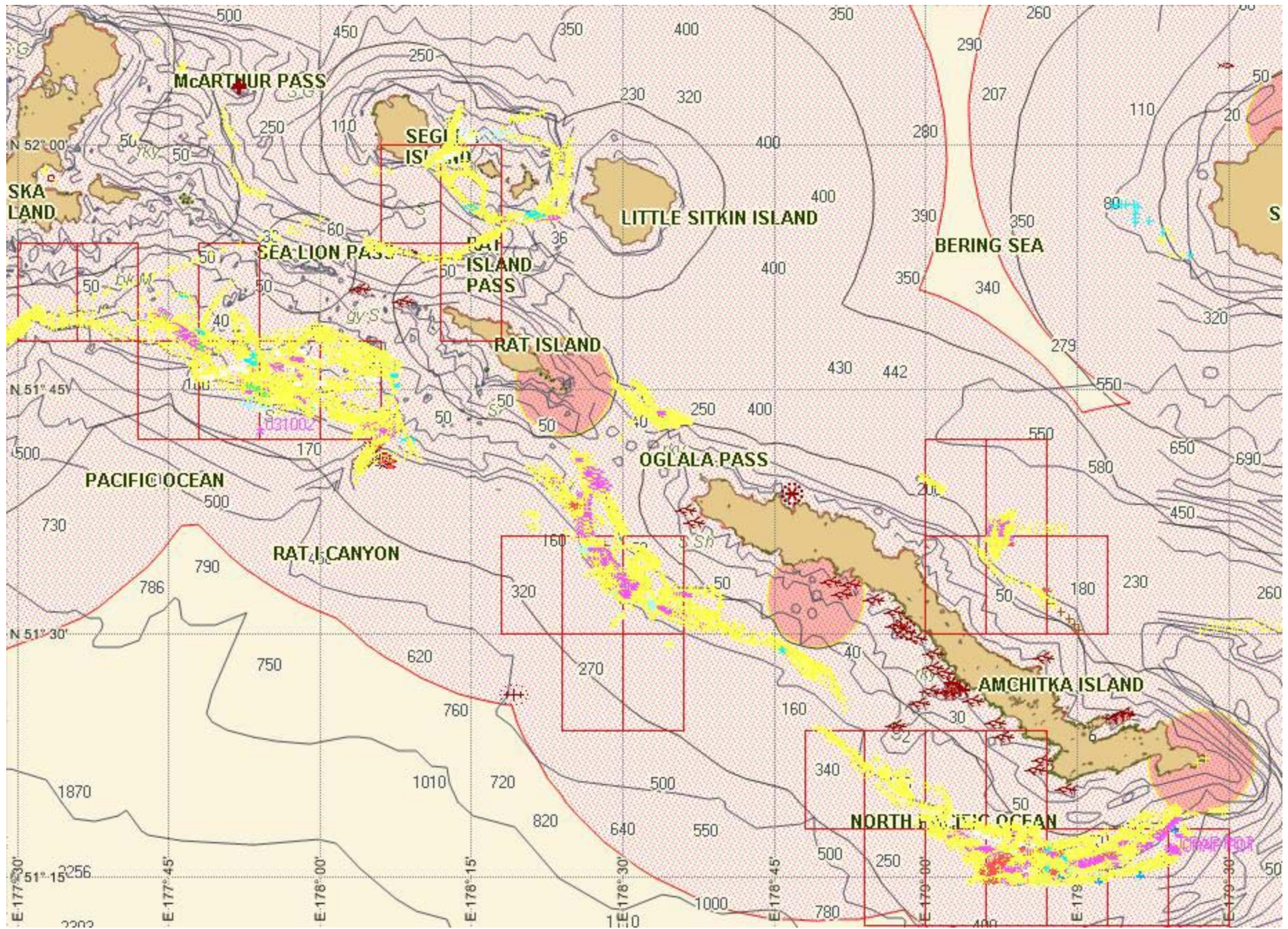


Aleutian Islands



# Process to verify spatial blocks where fishing has occurred

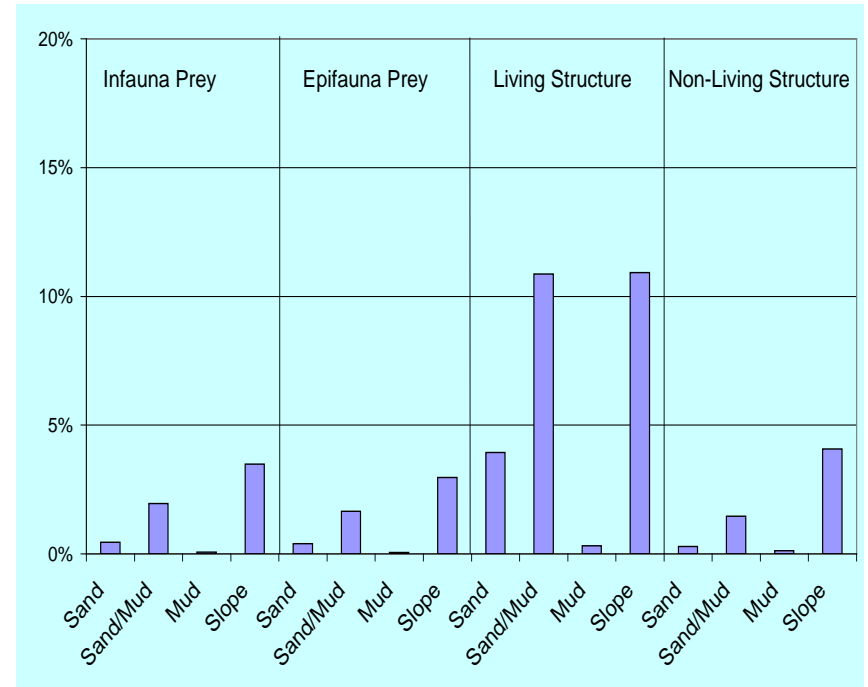
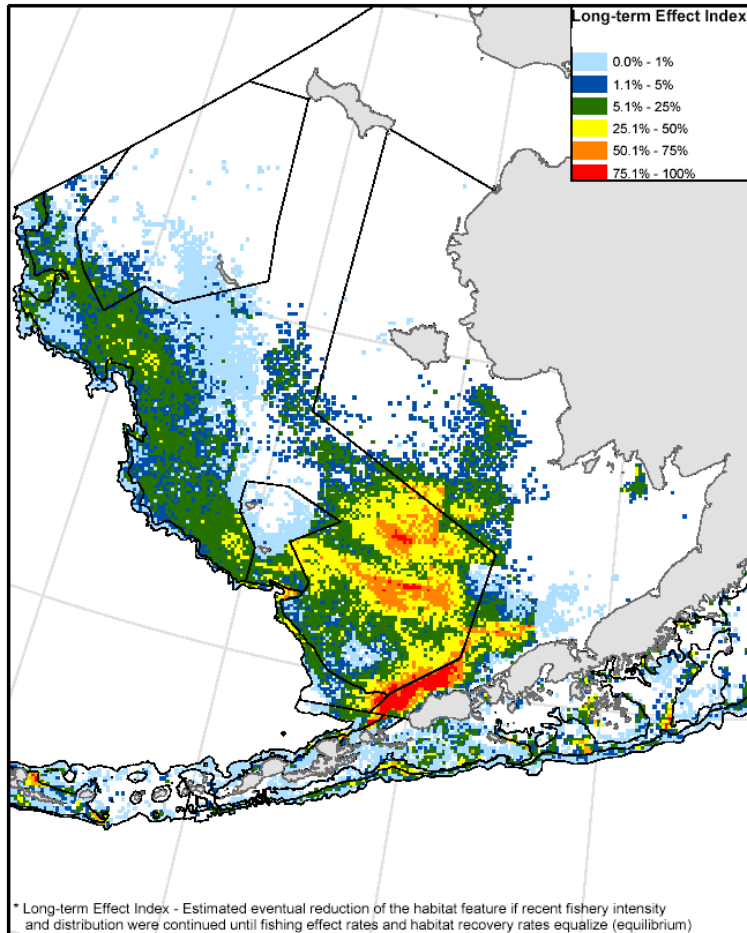




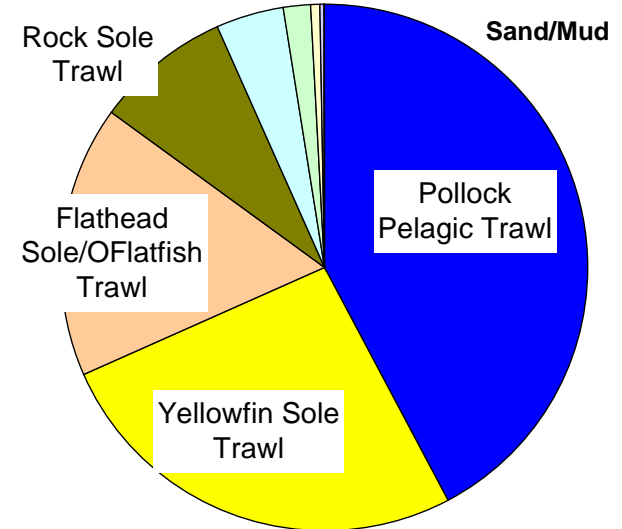
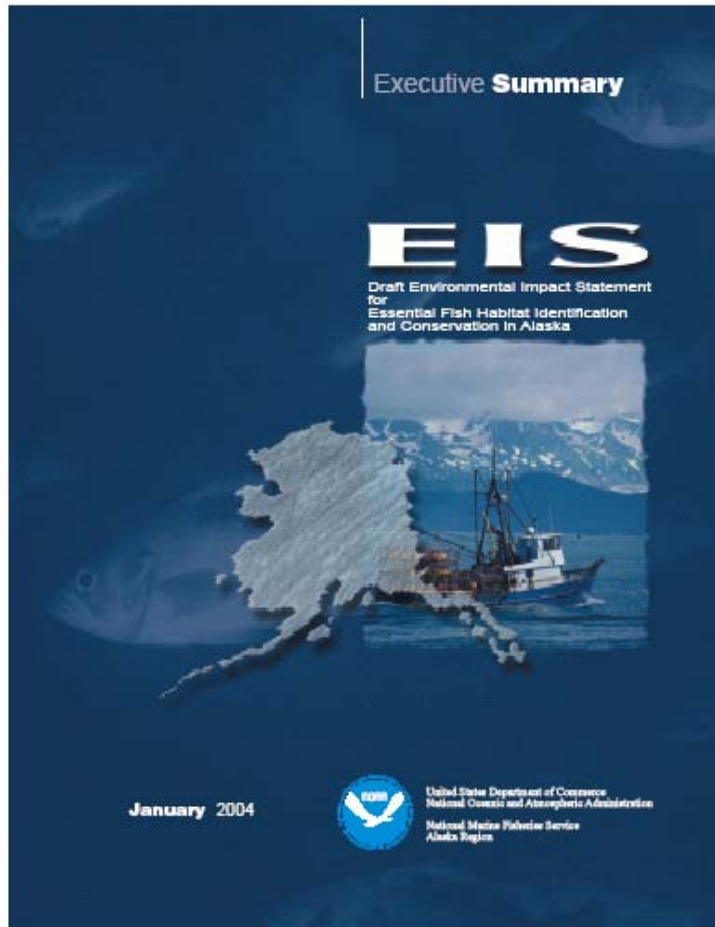
# Aleutian Islands coral protection measures successful because:

- Untrawled areas now “protected” from trawl fisheries, some coral gardens protected from all bottom fishing
- Area remaining open to trawling very likely to support fishery yields for Atka mackerel, Pacific ocean perch, and cod
- Closed area (footprint) approach made sense given static nature of fish aggregations, large extent of un-trawlable waters in Aleutian Islands
- Industry buy-in given long-lived, high profile, fragile deep water corals in Aleutian Islands

# Consideration of benthic habitat protections for the Bering Sea shelf: NMFS's Long Term Effects Habitat Model



# Consideration of benthic habitat protections for the Bering Sea flatfish and cod trawl fisheries via EFH effects model



Fisheries Affecting Sand/Mud Habitat Area  
Living Structure LEI (1998-2002)

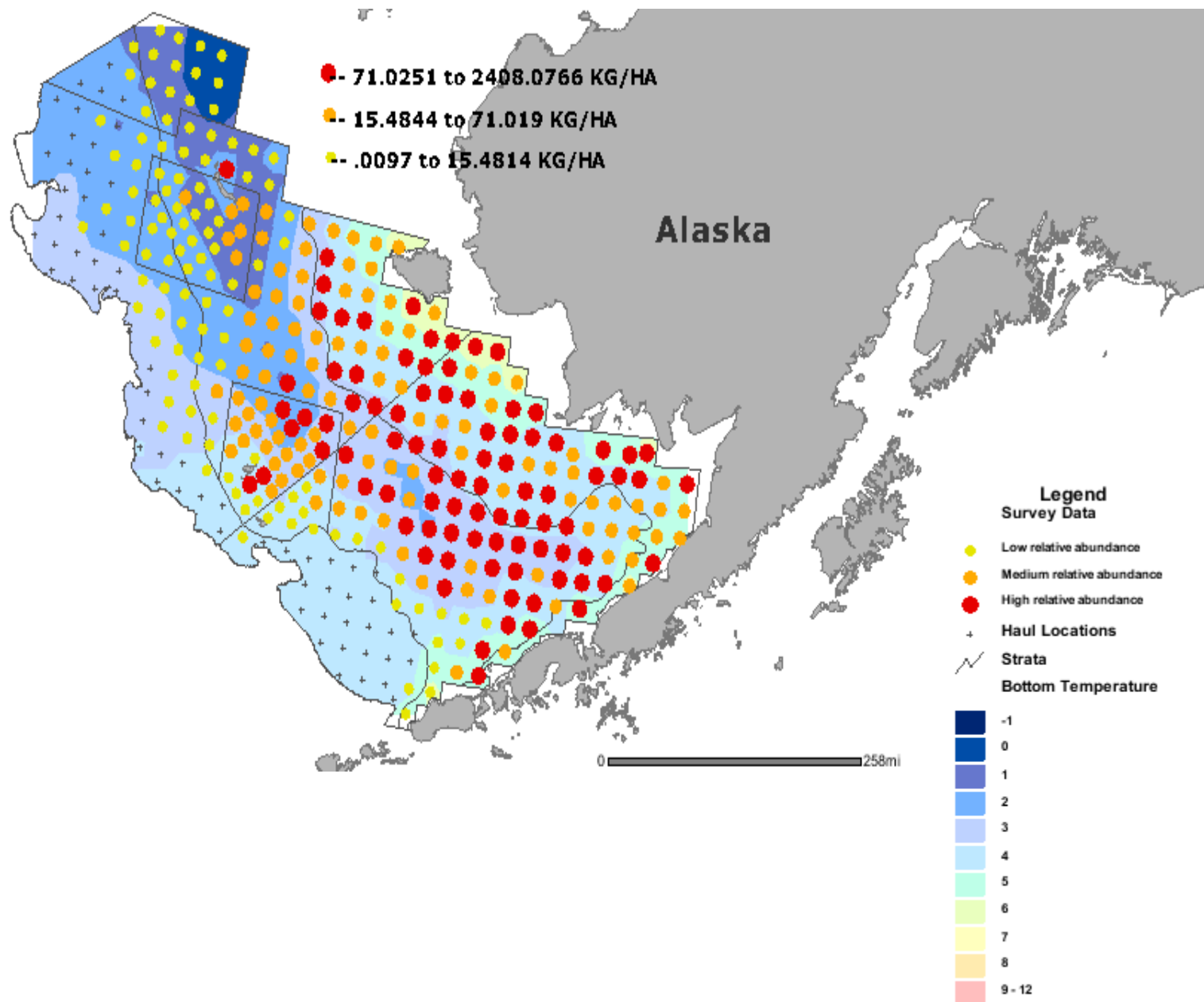
# How to mitigate the effects of flatfish trawling on Bering Sea Shelf?

With the success of the Aleutian Islands “freeze the footprint” measures, why not apply the same approach to the Bering Sea shelf?



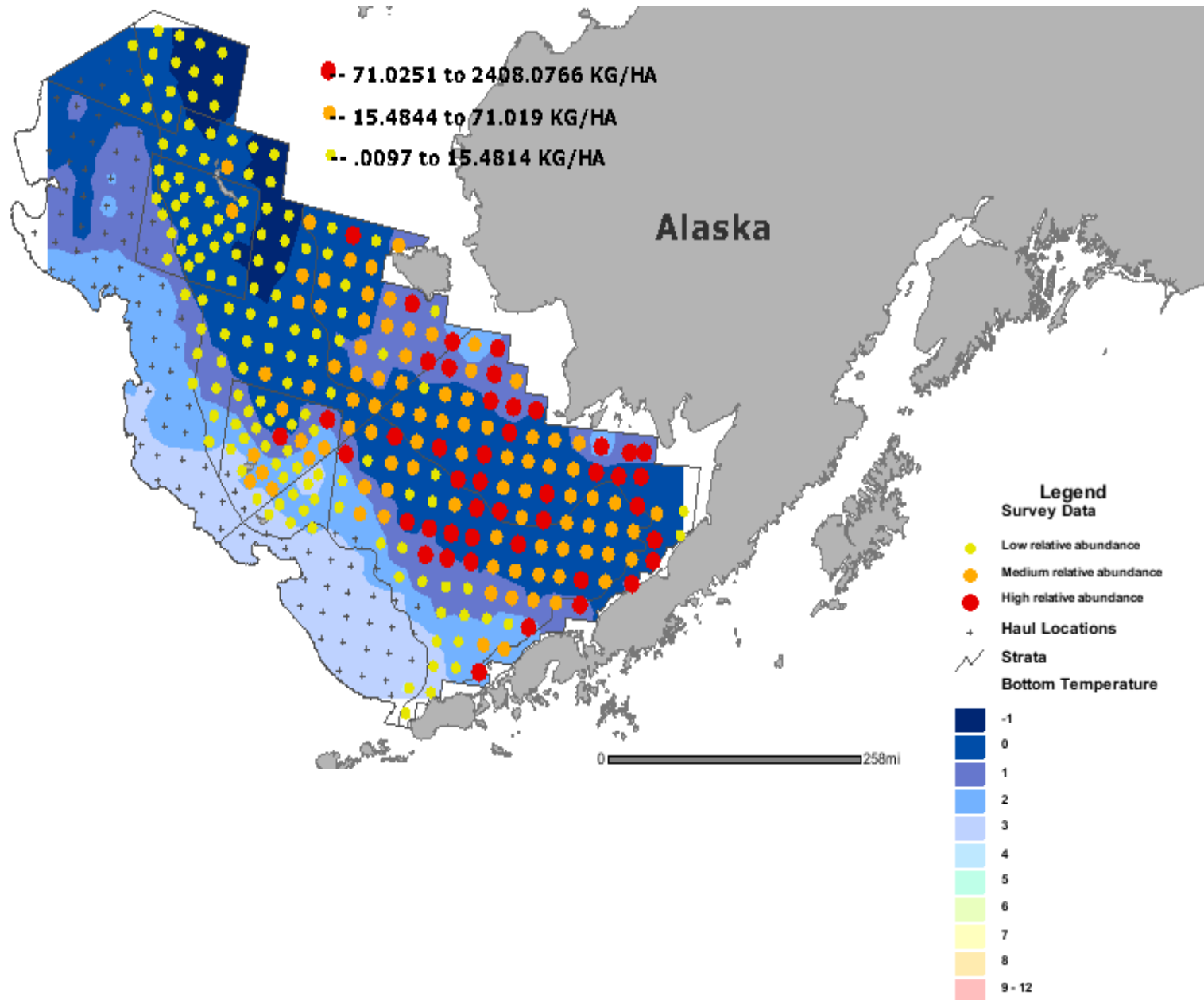
What's the problem?

yellowfin sole, 1998

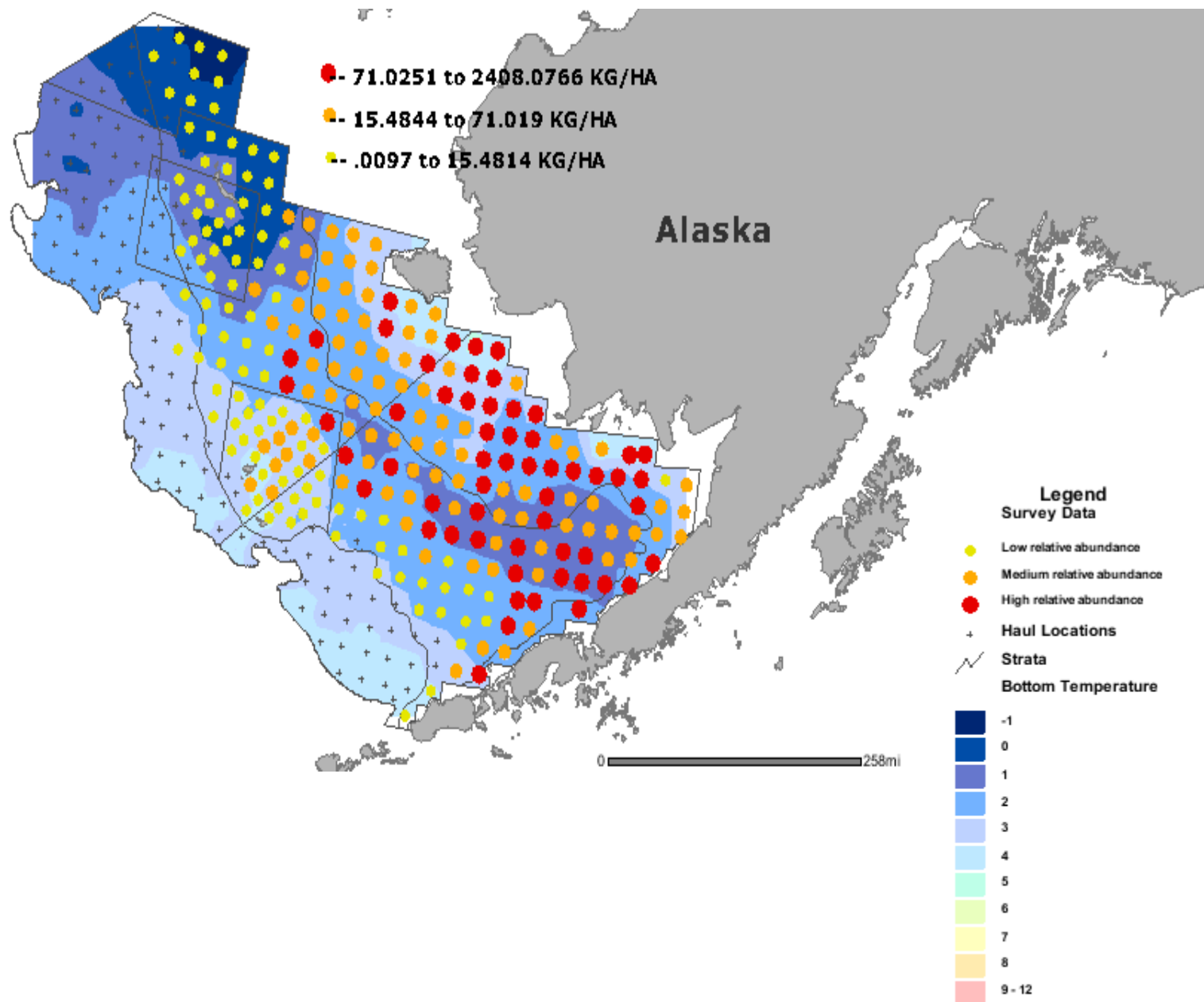




yellowfin sole, 1999



yellowfin sole, 2000



# Living Structure Animals of the Bering Sea shelf



# Living structure in Bering Sea consists mostly of low profile invertebrates



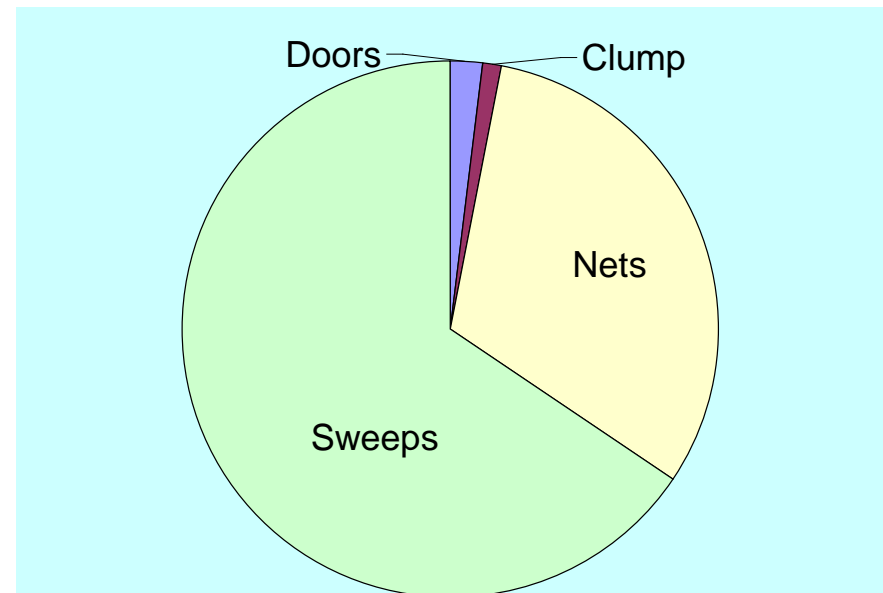
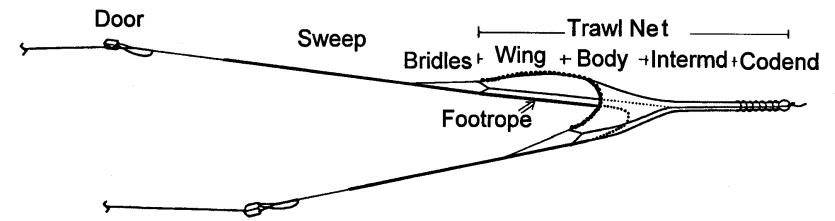
# Modifying bottom trawls to reduce effects on Bering Sea seafloor habitats



**Cooperative development and testing**

Dr. Craig Rose – NMFS, NOAA

# Elevated flatfish trawls in lieu of additional closed areas on the BS shelf



# Why Explore Gear Modifications to Mitigate Effects of Bering Sea Bottom Trawl Fisheries?

Relative to area closures (e.g. Aleutians)

- Reduces effects in areas of highest fishing intensities
- No redistribution issues. Closed areas could move fishing to lower catch rate areas and lead to more fishing (and habitat effects) to catch the TAC.
- Not dependant on consistent fish distribution

# Living Structure

## Aleutians vs Bering Sea shelf

### ALEUTIAN ISLANDS:

Fixed to hard substrates

High profile

Rigid structures

Ultra slow recovery

### BERING SEA:

On or anchored in  
mud or sand

Lower profile

Flexible structure

Recovery time  
relatively short



# Fisheries

## Aleutians vs Bering Sea shelf

### ALEUTIAN ISLANDS:

Fish and fishing distributions sharply constrained by substrate and complex terrain

### BERING SEA SHELF:

Fishing possible almost everywhere and fish distribution varies greatly between years and seasons

# Contrasting Protection Measures for groundfish trawl fisheries in the Aleutian Islands and Eastern Bering Sea shelf

- “One size fits all approach” does not work for two very different areas
- Fisheries, depth, sea floor type, bathymetry, food web and nutrient transport mechanisms all different
- Objectives for protection and management need to take differences into account
- Measures need to be tailored to differences