Using Regional Food Webs to Explore Fisheries and Foragers Interactions: A Case study on Northern Fur Seals

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St. Paul

Depleted: <50% of population in 1950’s

St. George

other concerns: climate change, pollock availability, fisheries interactions, potential conservation actions…
Resources around the islands

- 1990’s model (Ciannelli et al. 2004)
- ~ 40 groups
- Open ecosystems, (not mass balanced)
Updated circular model

Consumption (MT km-2/year)

- Large flatfish
- Adult cod
- Fur seals

1990's

50NM 100NM 150NM
Tailor regions to fur seal foraging

- Telemetry data: fur seals go further
- Breeding sites have separate foraging habitats
- Most fur seals have high site fidelity but some individuals do change foraging route

Robson et al 2004
Tailor regions to fur seal foraging

Width: 150 nm; length 200 nm
Changes in fur seal foraging during cold/warm years

Model set up

- Fish cold years: average of 1999, 2006, 2007
- Fish warm years: average 2003, 2004, 2005
- NFS cold year diets 1002, 1994, 1995
- # of NFS scats: 142-438 for region/temp combo
Northern fur seal diets
major consumers of pollock
major consumers of pollock
Fisheries removals

FISHES

- Adult cod
- Rockfish
- Sculpin
- Skates
- Big flatfish
- Small flatfish
- Adult pollock
Spatial distribution of fisheries
Fisheries and predation on pollock
Summary

- There are clear differences across foraging habitats.
  - Interaction with other pollock consumers is different across foraging habitats.
  - Differences across foraging habitats prevail between cold/warm years.
- Same action will have different effect on the foraging habitats and breeding sites.
questions?