

Sea otters as apex predators in Southeast Alaska



Ginny Eckert¹, Sean Larson¹, Zac Hoyt¹, Verena Gill², Sunny Rice¹

¹School of Fisheries & Ocean Sciences, UAF & ²USFWS



Russia

Alaska

Canada

U.S.A.

Historic Range of Sea Otters

~1750 ~300,000



Russia

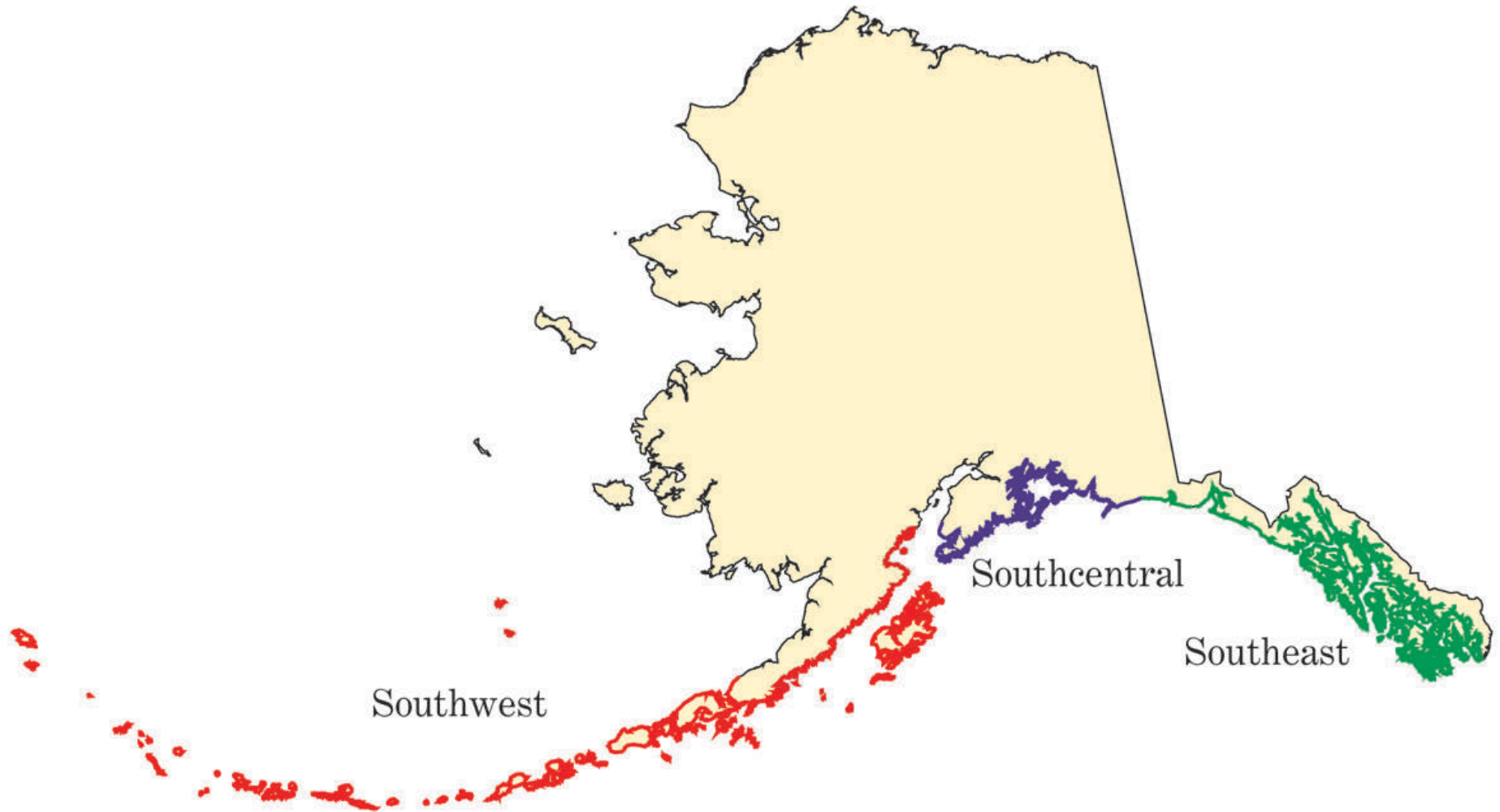
Alaska

Canada

Remnant Sea Otter Colonies

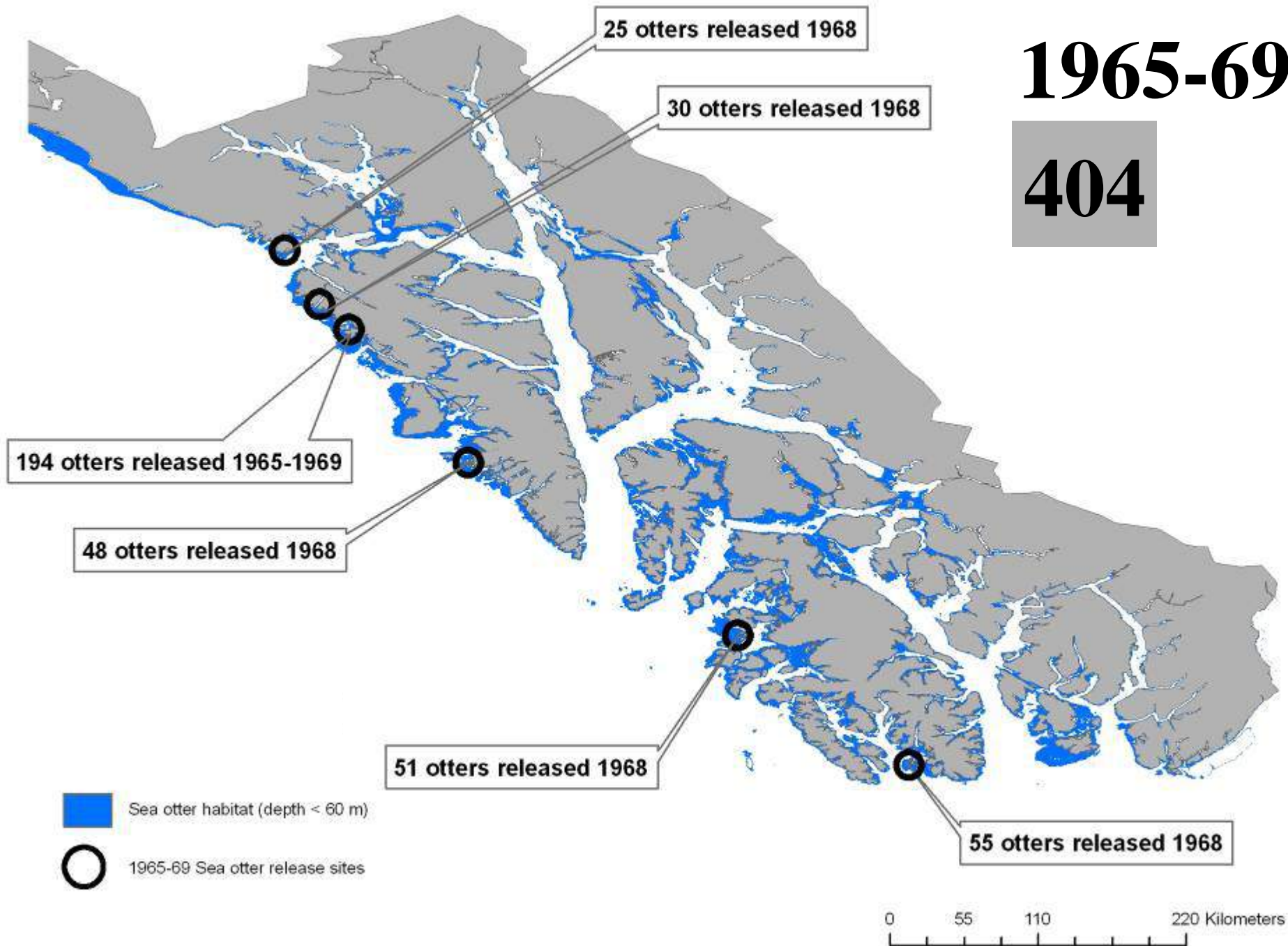
~1911 ~1,000

Northern Sea Otter Stocks in Alaska



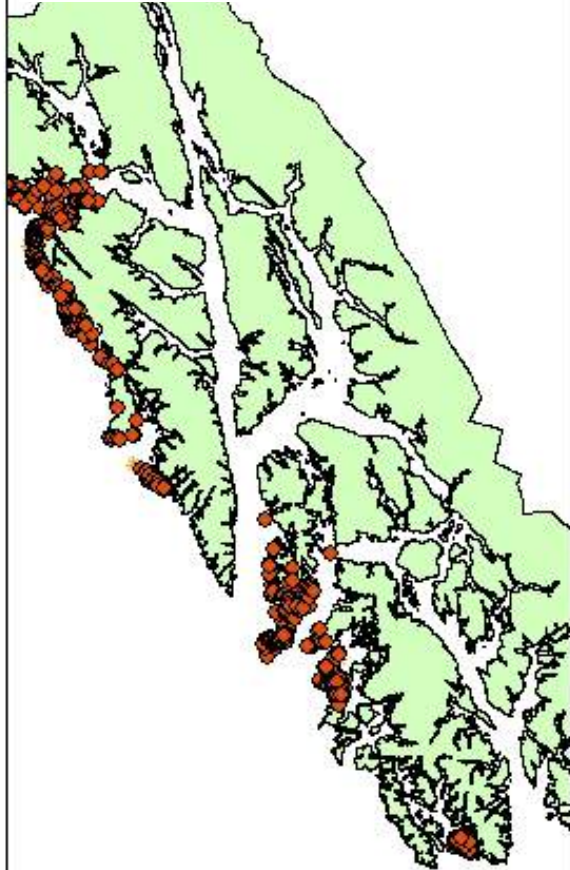
1965-69

404



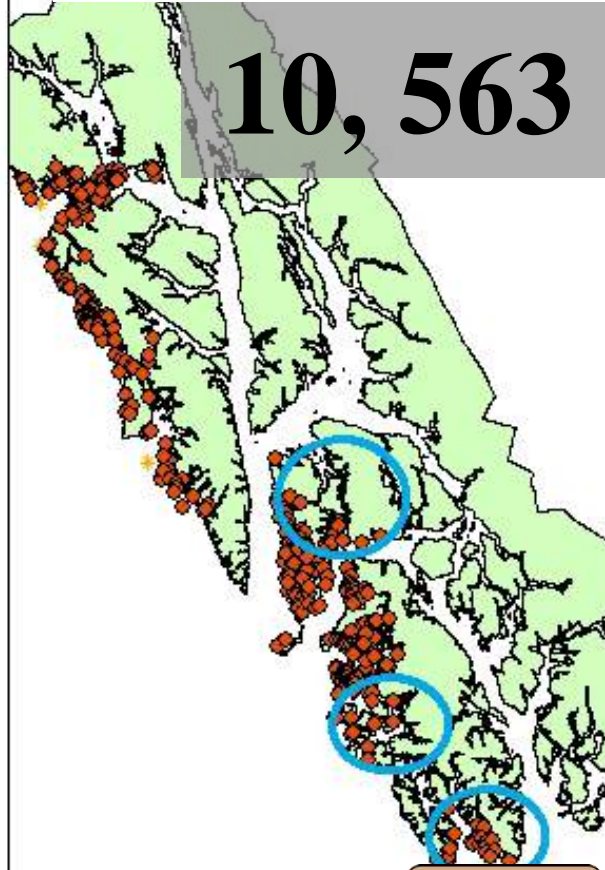
Range Expansion

1987-1989



Sea otter sighting 0 25 50 100 km
+++++

2002-2003

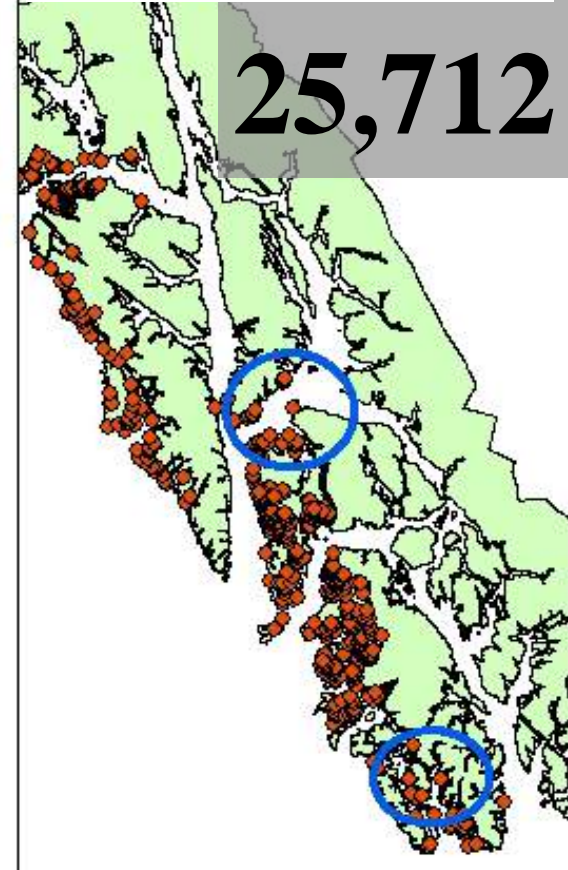


10,563

Areas of major
range expansion
since 1989

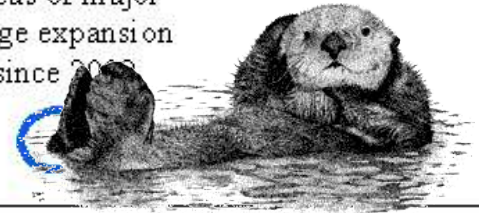


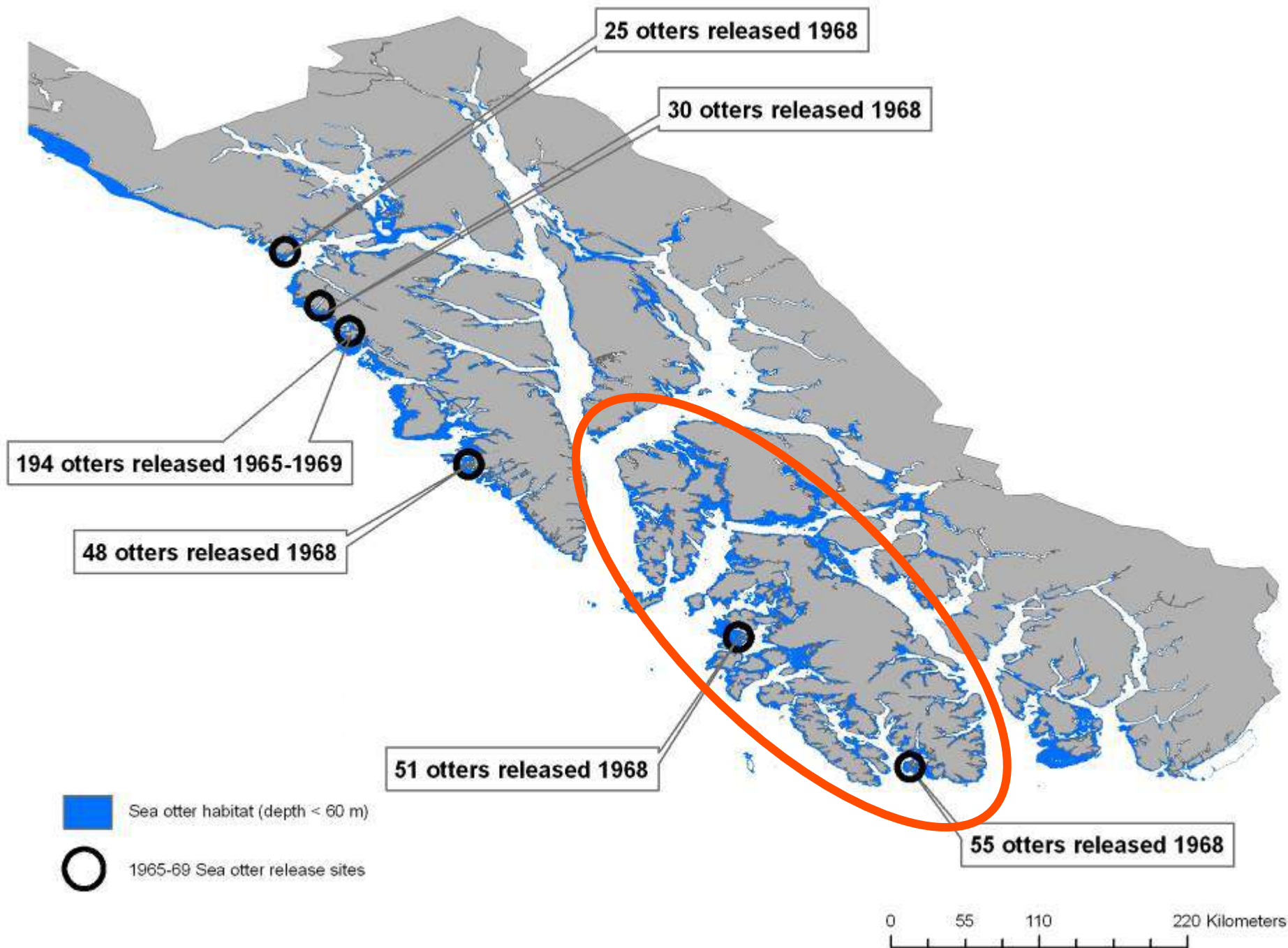
2010-2012



25,712

Areas of major
range expansion
since 2003



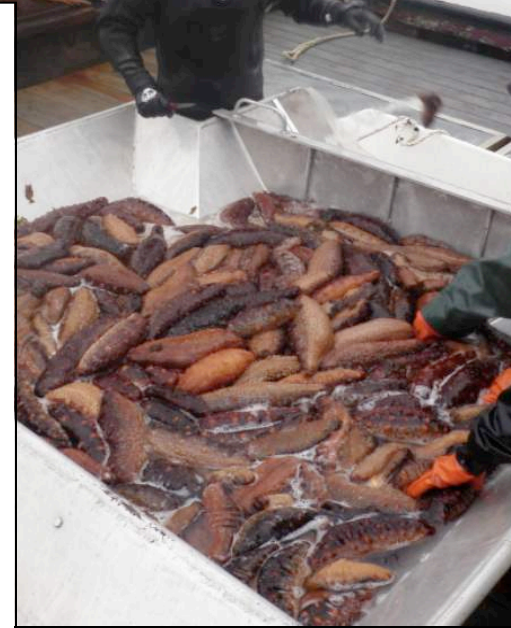
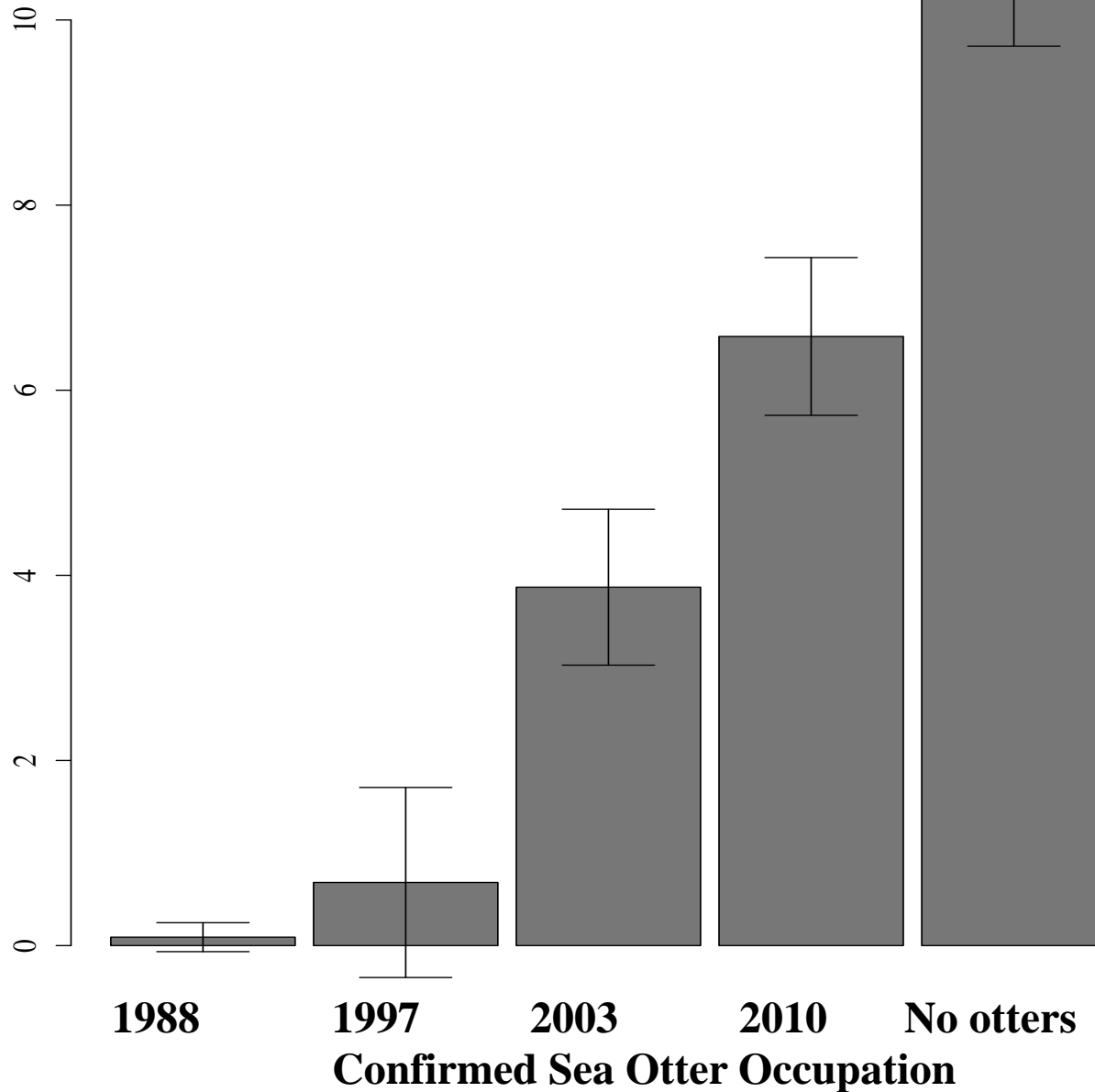




Sea Cucumber Impacts

Sea cucumber density

Mean \pm 95% CI Sea Cucumbers per m Shoreline



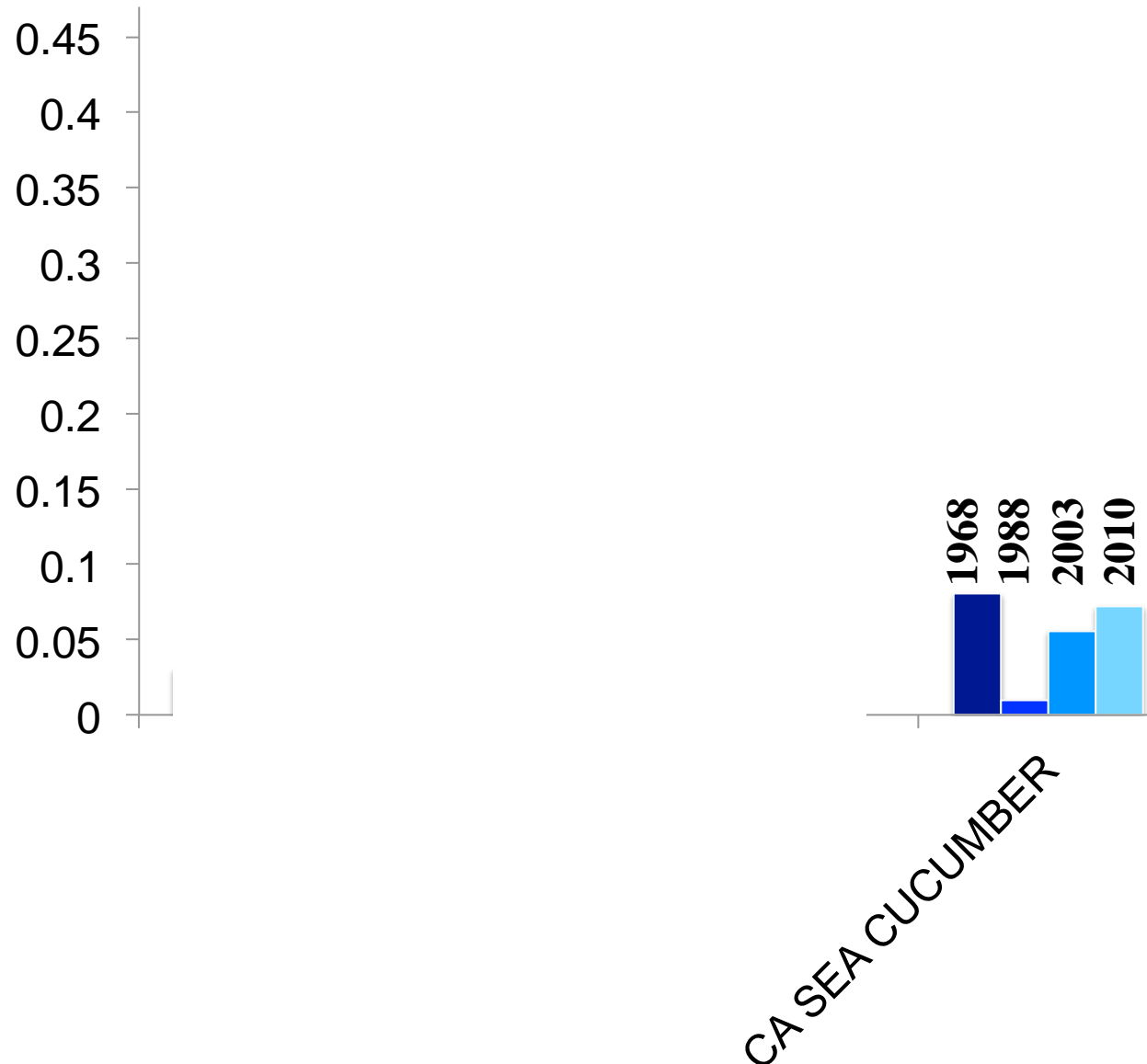
Larson et al. 2013 CJFAS

Foraging data collection



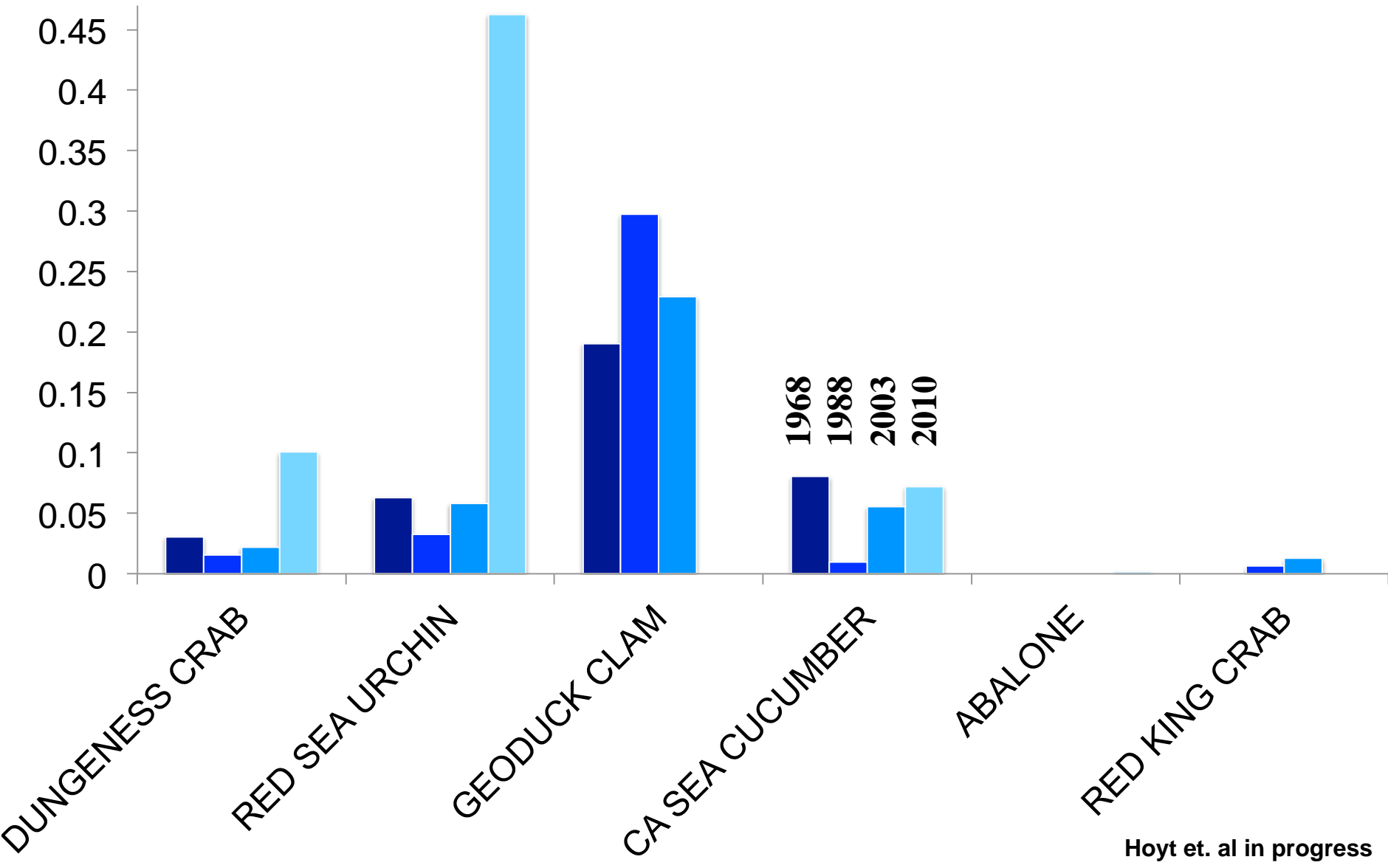
Preliminary diet composition 2010-2012

Commercially important species as a function of sea otter colonization



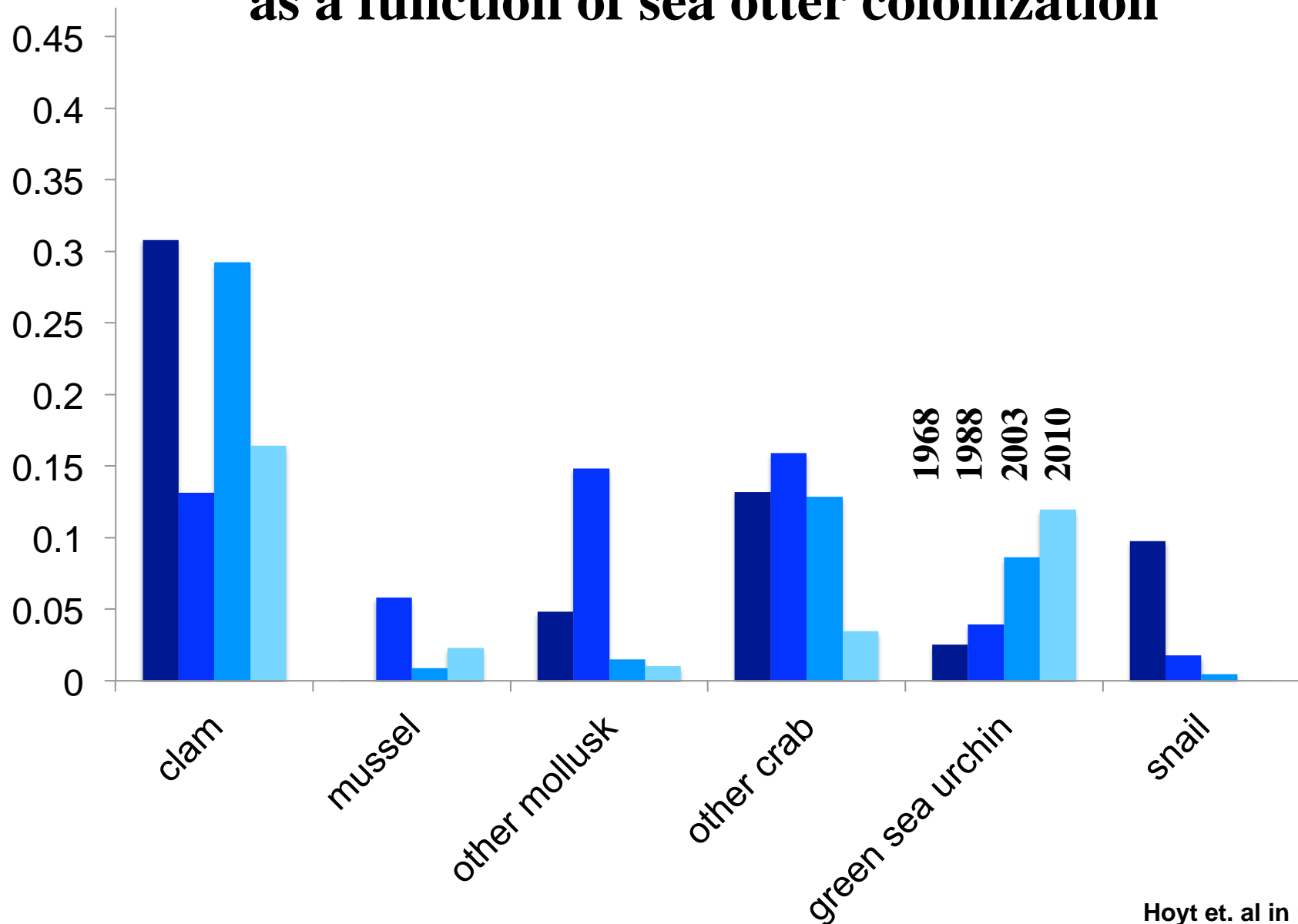
Preliminary diet composition 2010-2012

Commercially important species as a function of sea otter colonization



Preliminary diet composition 2010-2012

Non-commercially important species as a function of sea otter colonization



Sea otters greatly affect shellfish populations

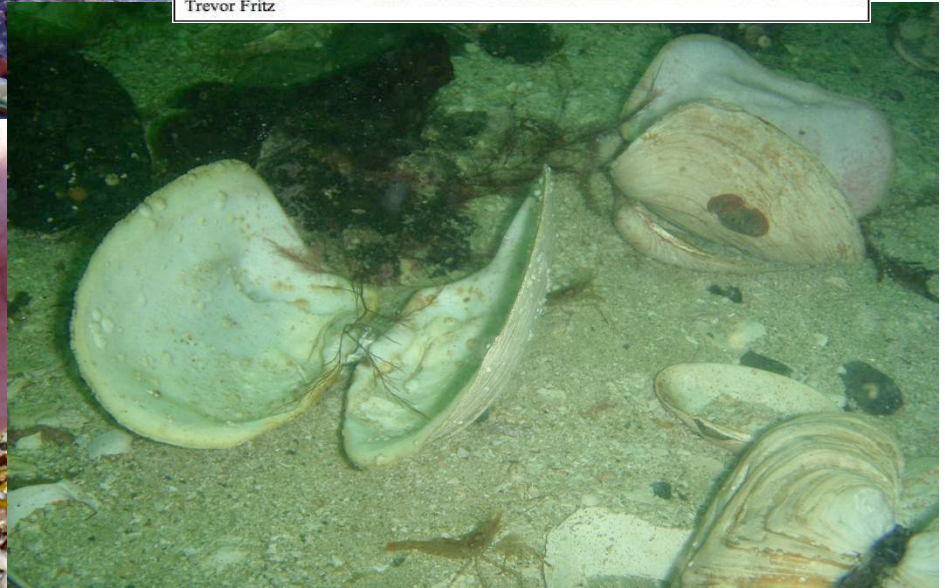
Declines in sea cucumbers can be attributed to sea otters.

Commercially important species - a large proportion of the diet

Highly desired species – urchins & Dungeness crab – eaten first



Trevor Fritz

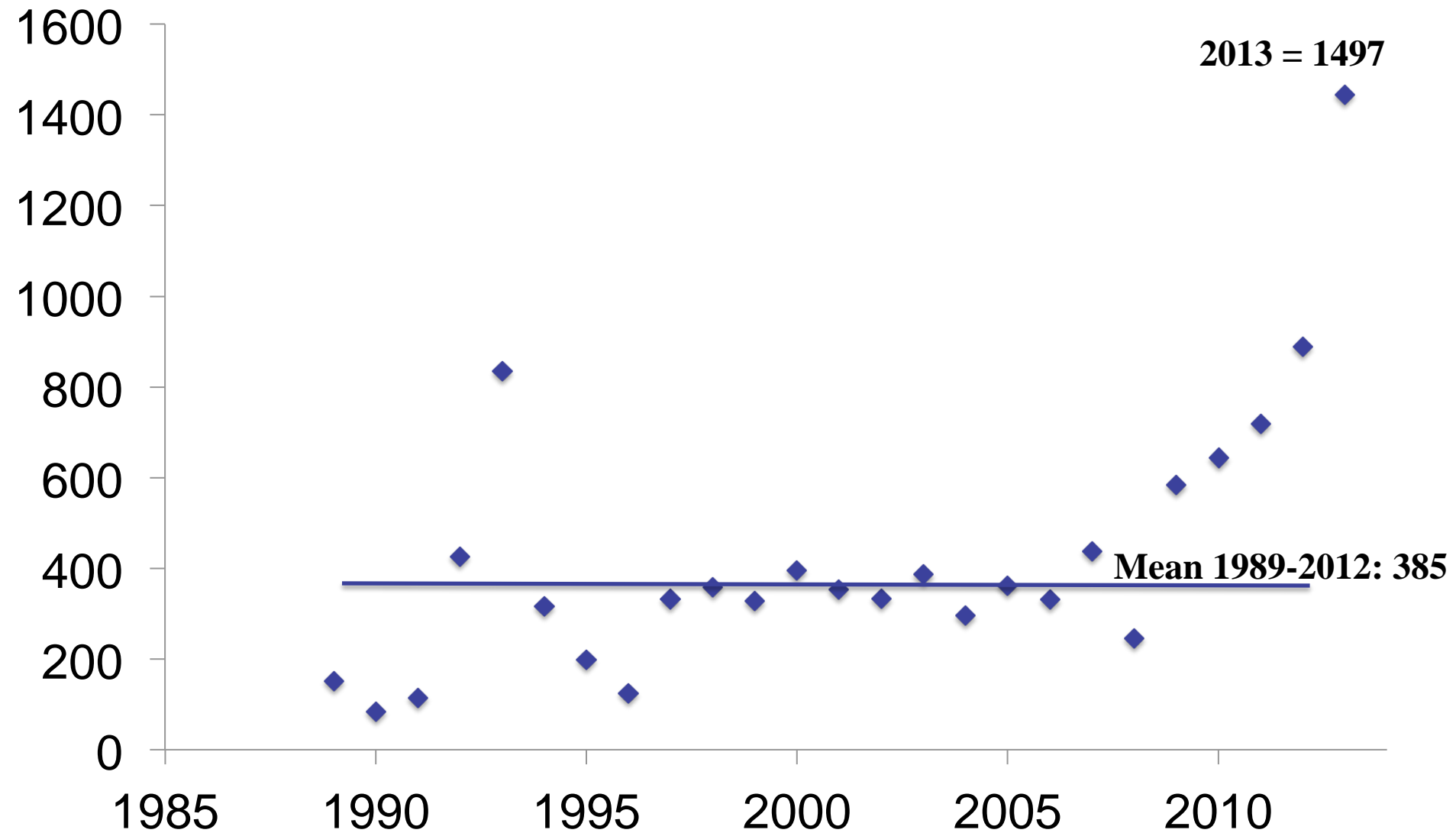


Hunting




Photos by Peter Williams
seaotterfur.com

Legal harvest of sea otters



Ecosystem Based Management



- 
- An underwater photograph showing a sea otter floating on its back, surrounded by a large school of small, silvery fish. The water is clear and blue.
1. Sea otters were absent for hundreds of years.
 2. Reintroduction & now 25,000
 3. They greatly reduce shellfish populations
 4. Need ecosystem-based management



Thanks



Sea otter movement study

Animals are currently being located via fixed wing aircraft and small vessel.



30 otters (16 males and 14 females) captured and instrumented with VHF transmitters in May 2011



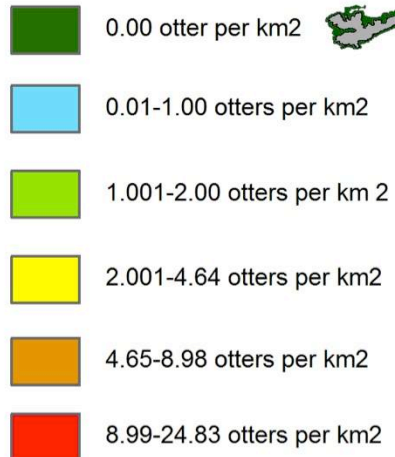
1800's-1968

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

1968 Release

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

1975

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

1983

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

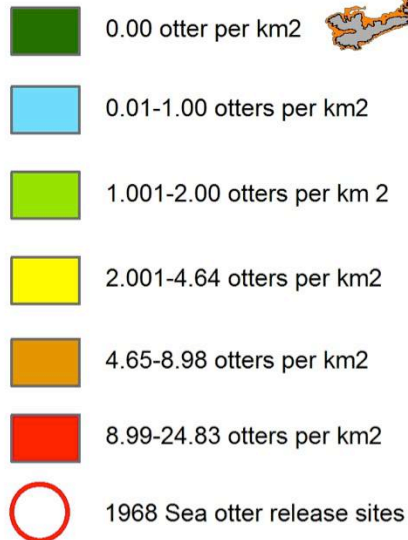
1987-1988

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

1999

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

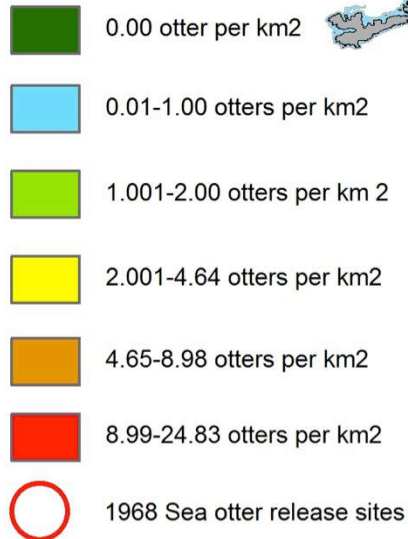
2001-02

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

2003

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

2010-11

Admiralty
Island

Kuiu
Island

Kupreanof
Island

Prince of
Wales
Island



0 30 60 120 Kilometers

Fisheries affected in southern SE AK & **exvessel value 2010-2011**



\$5.5 million

Dungeness crab
Metacarcinus magister



Red sea urchin
Strongylocentrotus franciscanus



\$3.4 million

Sea cucumber
Parastichopus californicus



\$5.9 million

Geoduck clam
Panopea abrupta