



## Steller Sea Lion Population Status 2009

### Alaska Ecosystem Program

NOAA Fisheries  
National Marine Mammal Laboratory  
Seattle, WA

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Vladimir Burkanov Natural Resources Consultants  
Peter Olesiuk Fisheries and Oceans Canada  
Don LeRoi Aircraft Imaging Solutions



## Outline



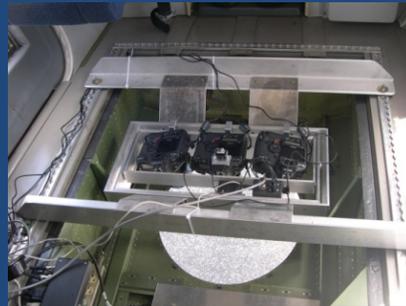
- Results of 2009 AK Aerial Survey
  - Pup Production
  - Non-Pup Movement in SE Alaska, Prince William Sound, Kenai and Kodiak
- Update Status of western DPS
  - Alaska
- Update Status of eastern DPS
- Vital Rates
  - Inferences from survey data
  - Preliminary mark-resight (branding) estimates
- New Food Habits Information



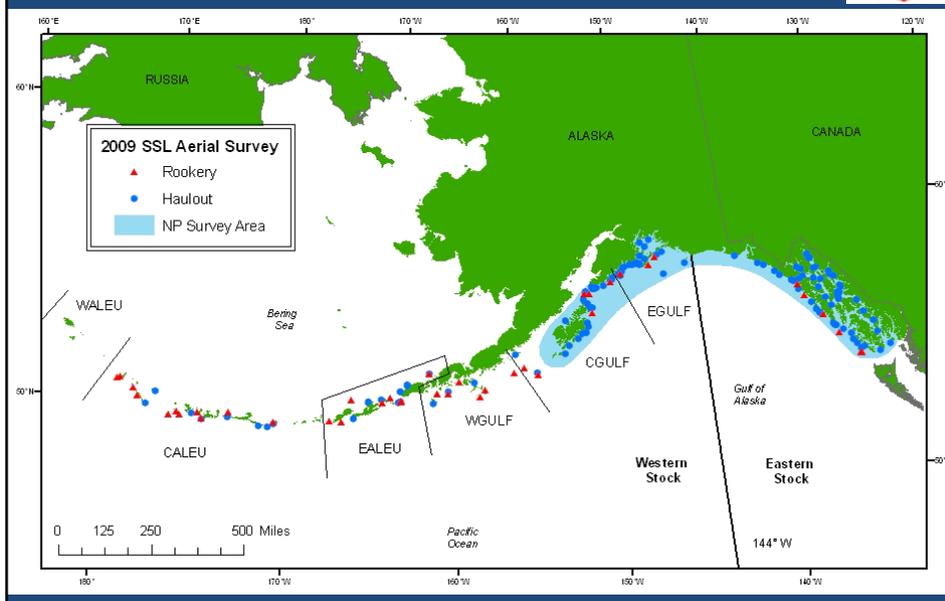
## Alaska Steller Sea Lion Aerial Project 2009

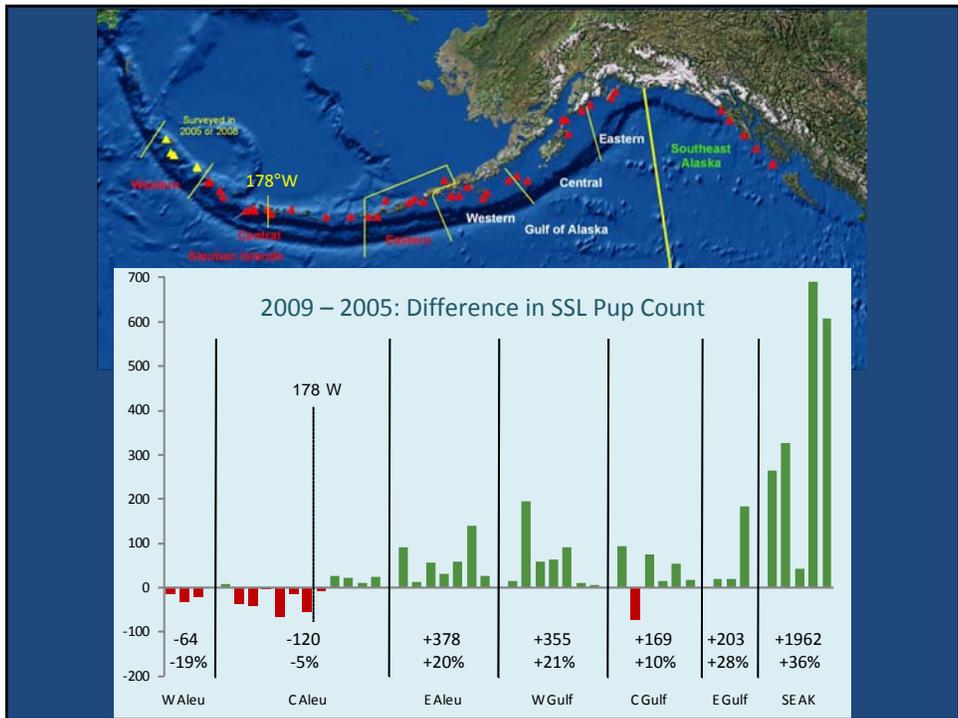
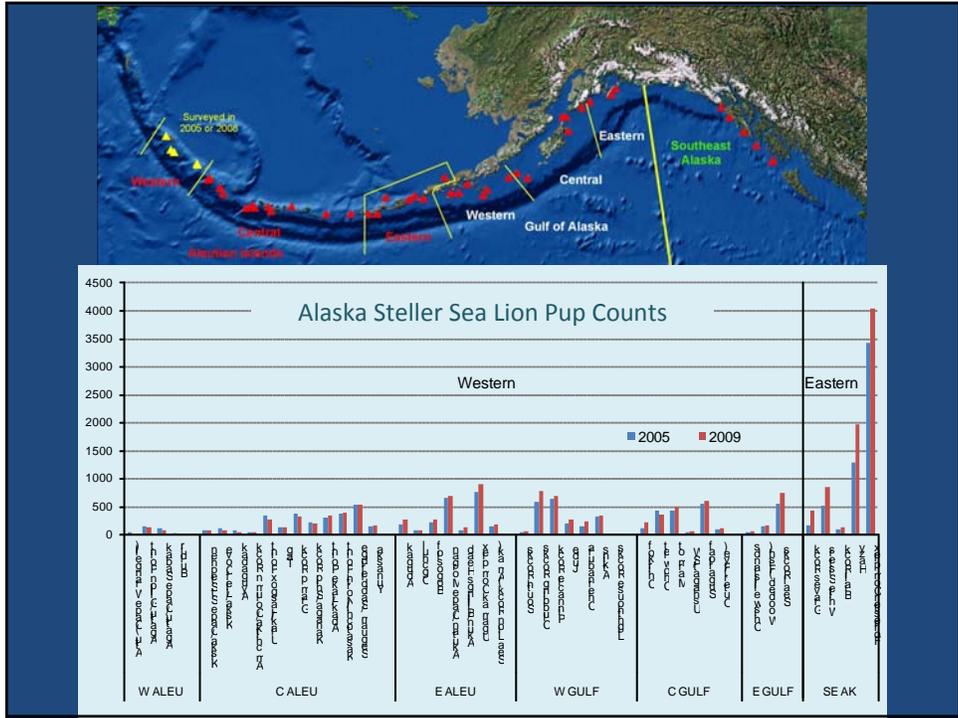


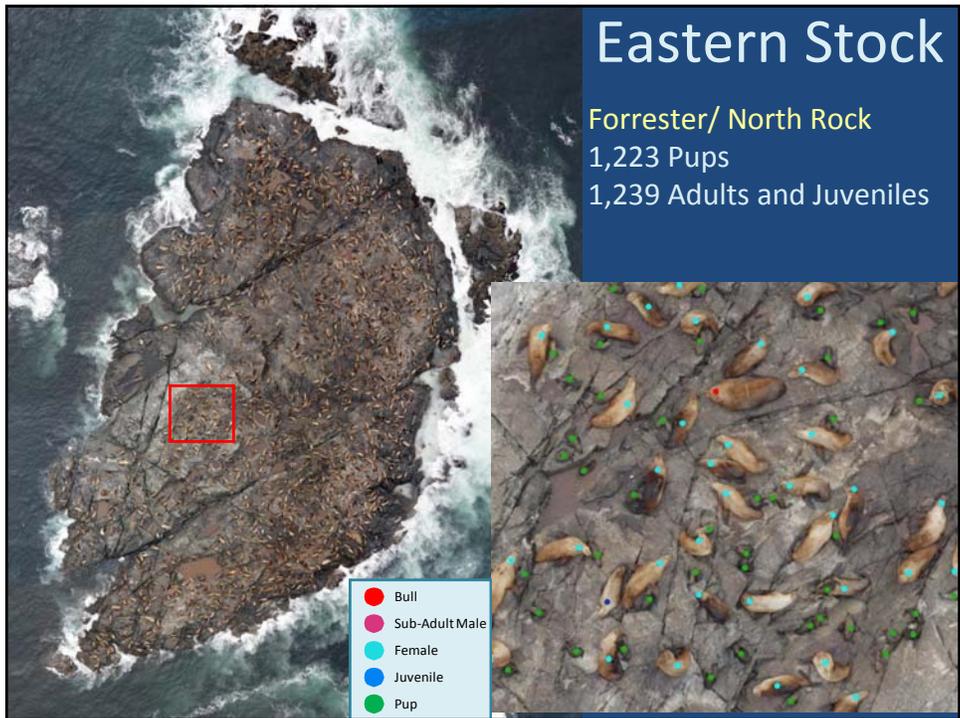
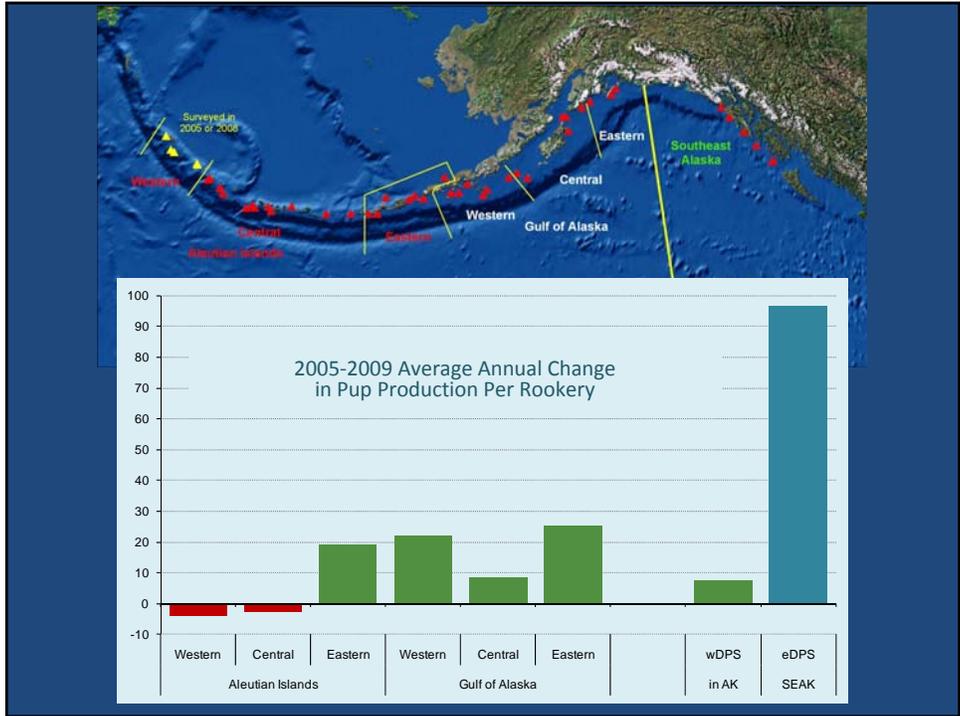
- SSL Pup Production in AK
- Seasonal movement in N GOA
- 24 June – 15 July
- 3 cameras, 85 mm lenses and forward motion compensation
  - 1 vertical, 2 oblique at 21°
  - ~ 1,000 ft swath at 750'
- ~ 12,000 miles flown
- ~ 15,000 pictures taken
- 172/178 sites surveyed

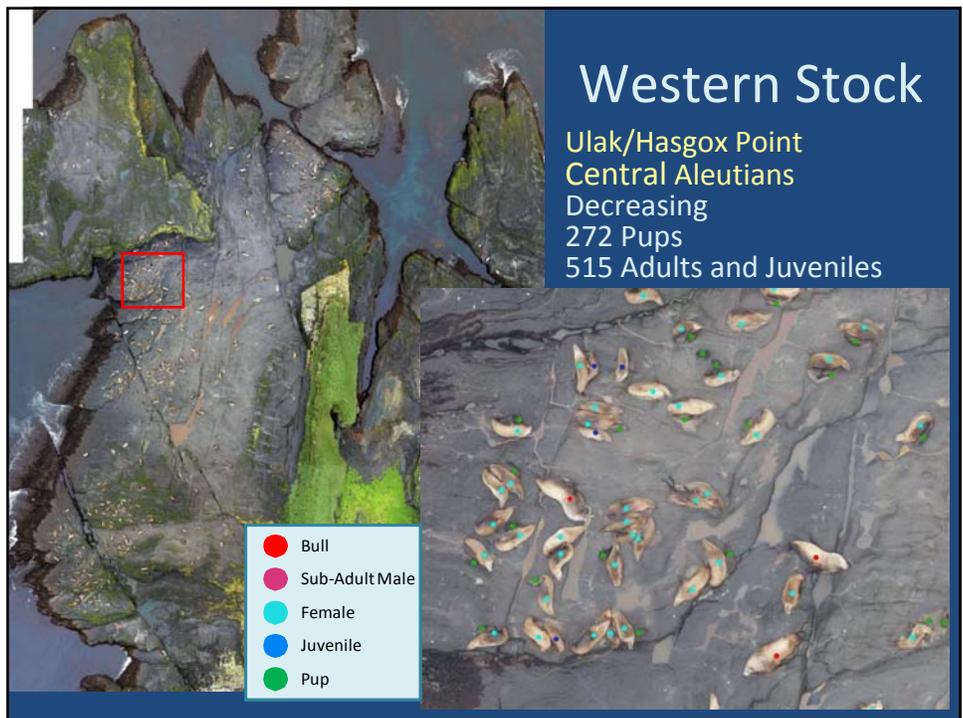
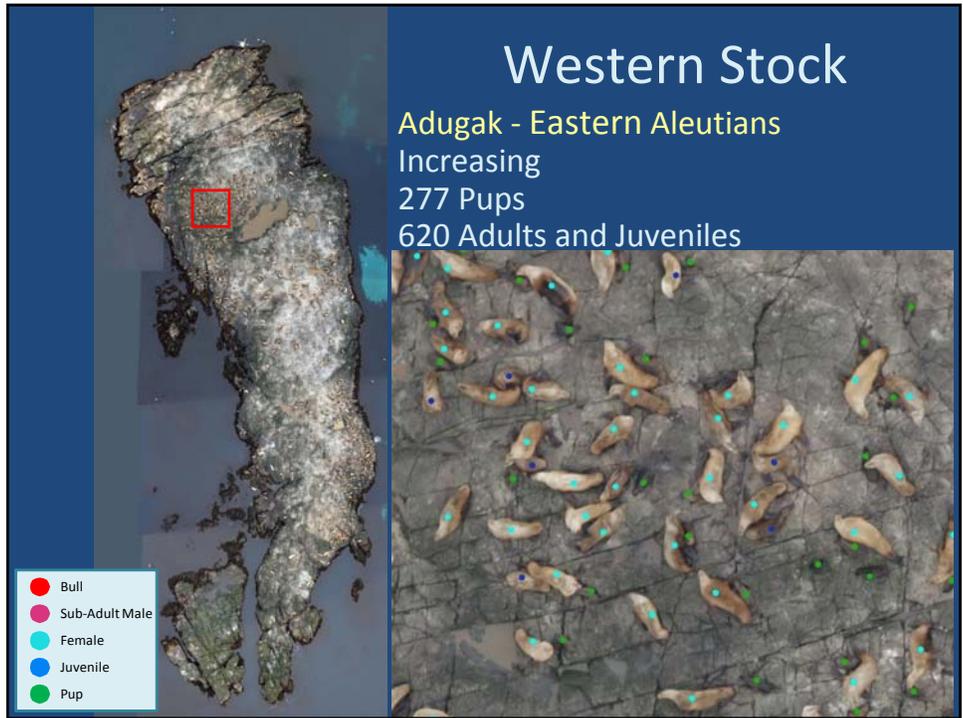


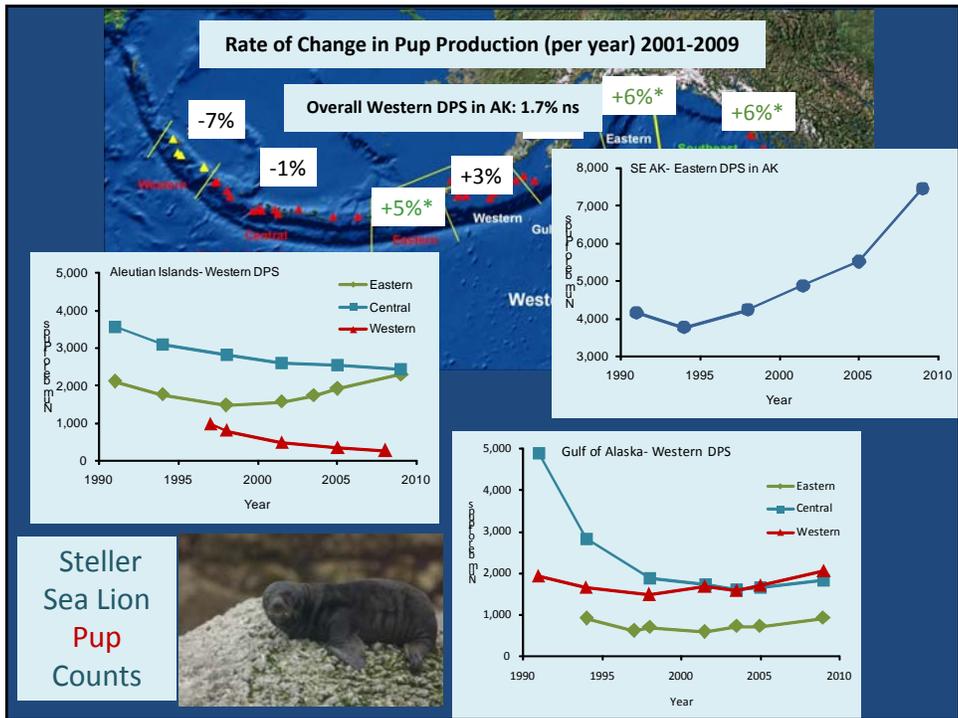
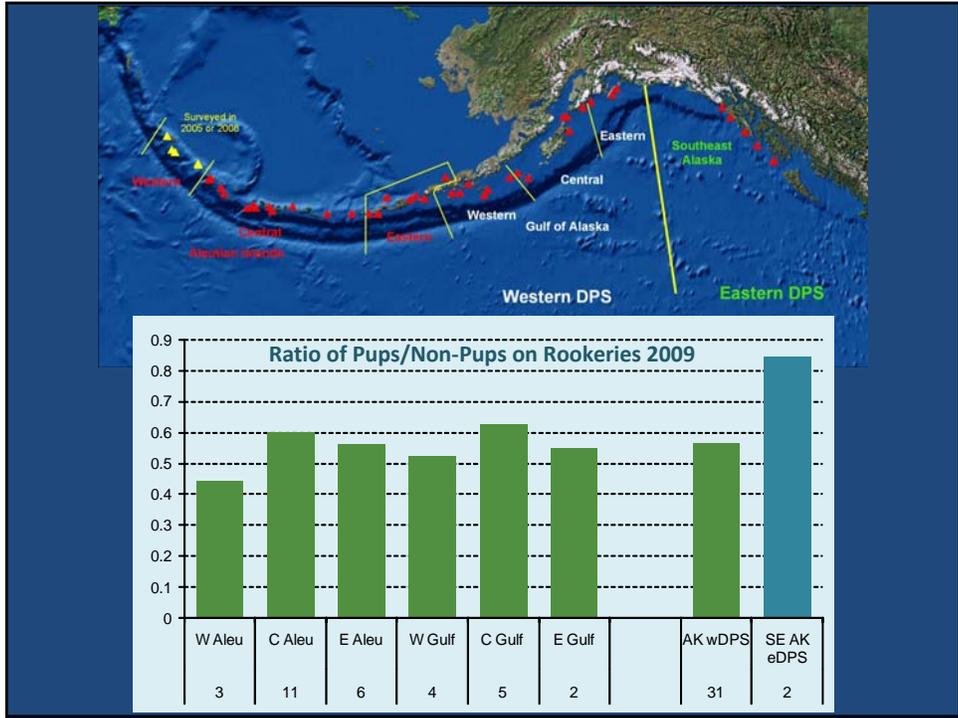
## Steller Sea Lion Aerial Survey 24 June-15 July 2009



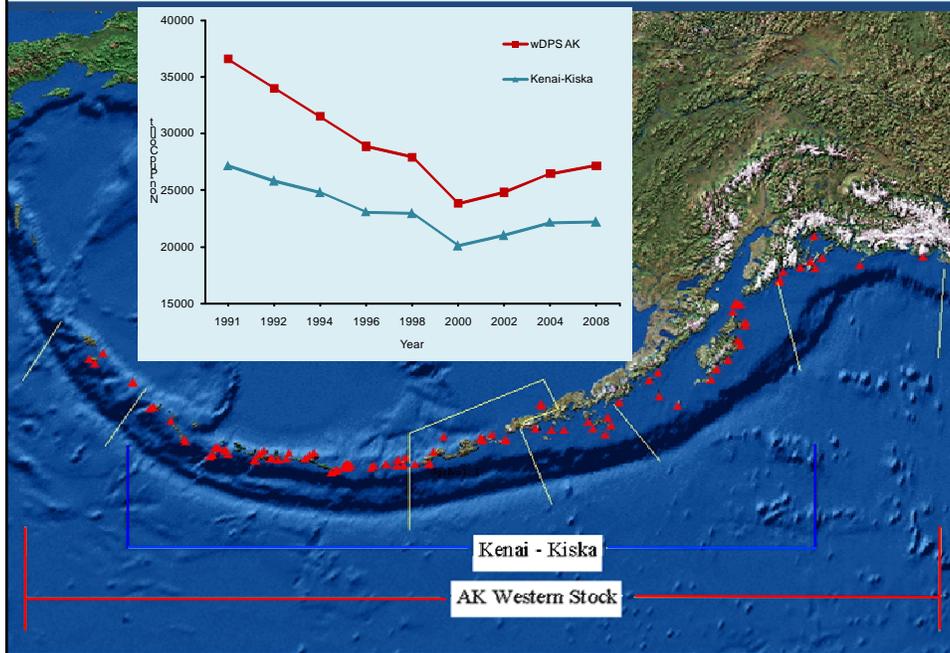




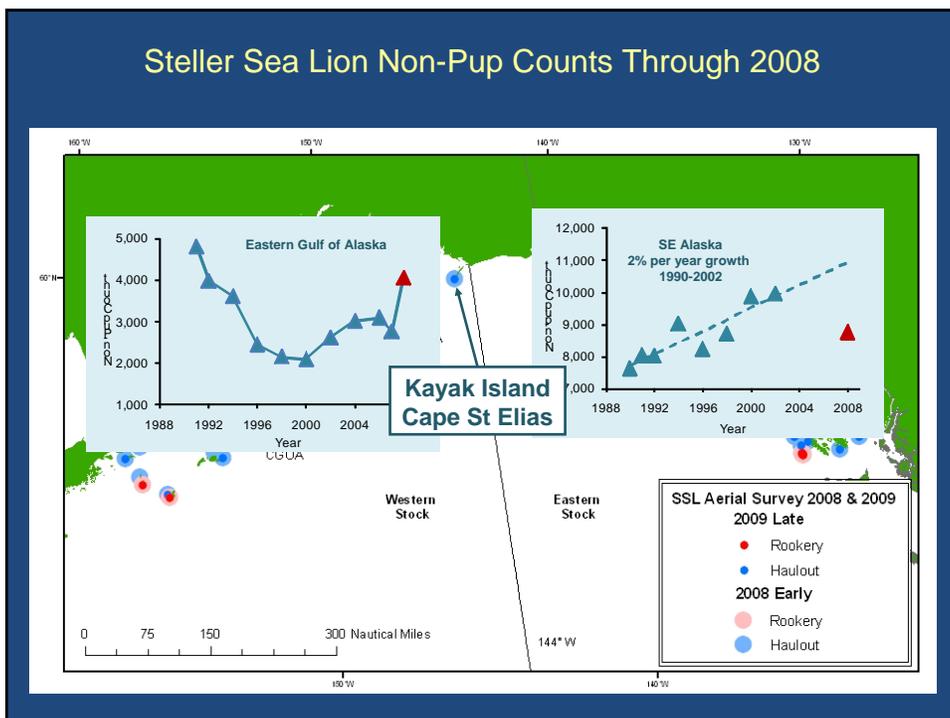




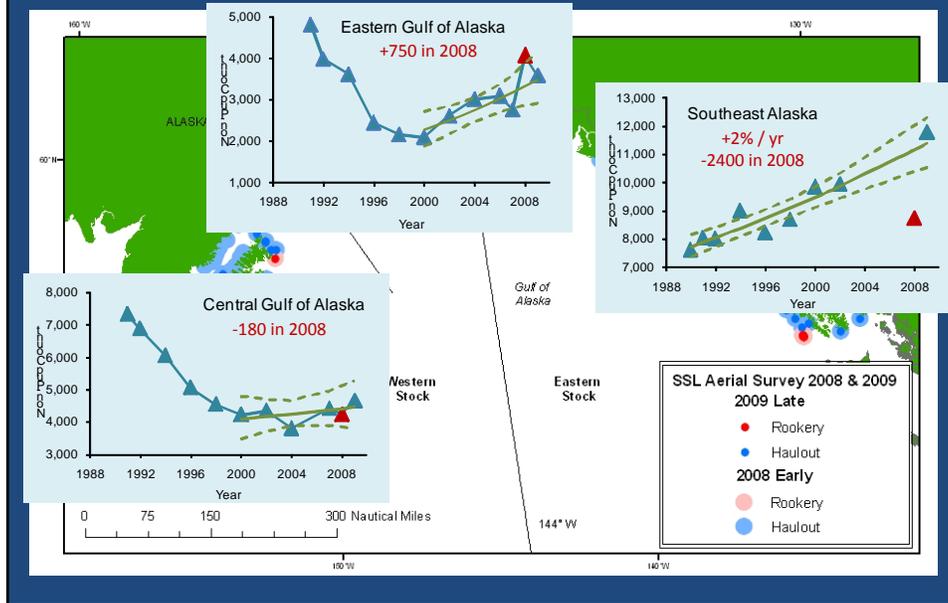
## Western Steller Sea Lion **Non-Pup** Counts in Alaska



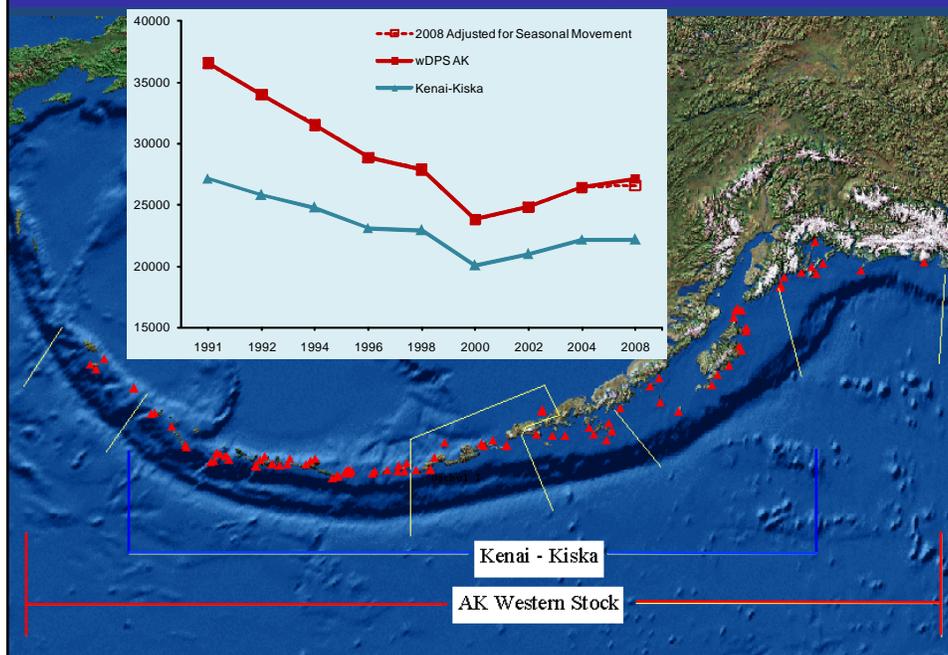
## Steller Sea Lion Non-Pup Counts Through 2008



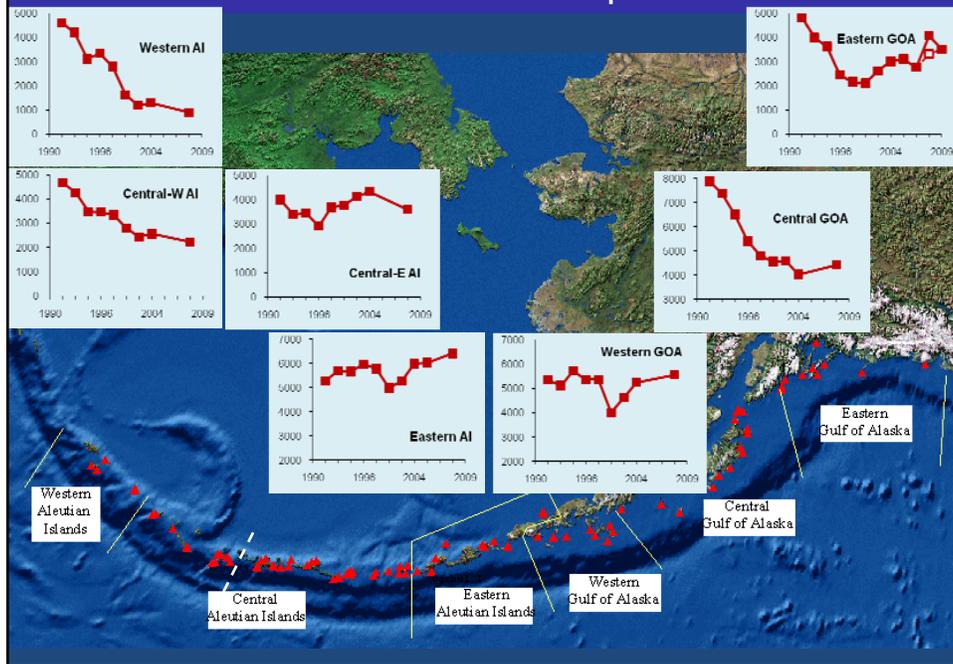
## Steller Sea Lion Non-Pup Counts Through 2009



## Western Steller Sea Lion Non-Pup Counts in Alaska



## Western Steller Sea Lion Non-Pup Counts in Alaska

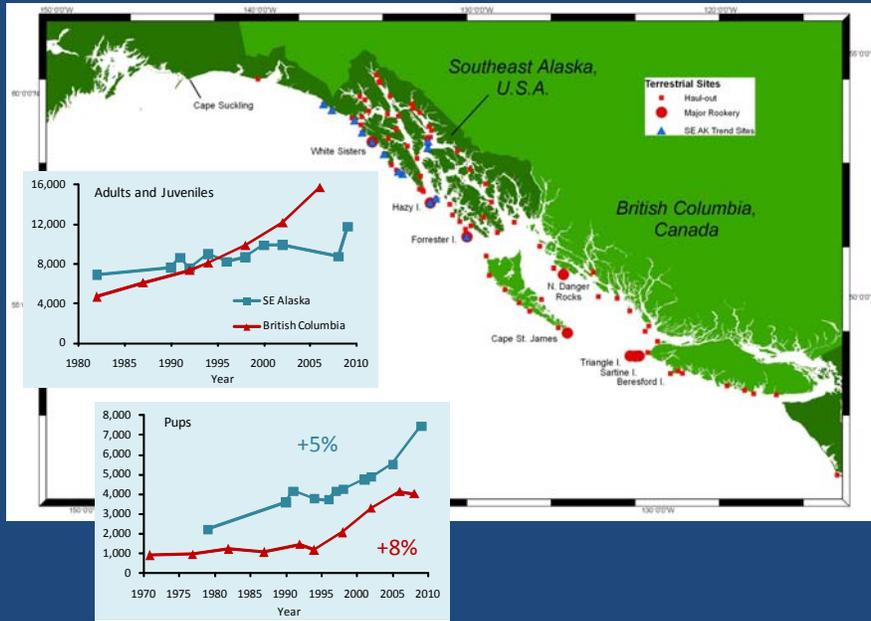


## Outline

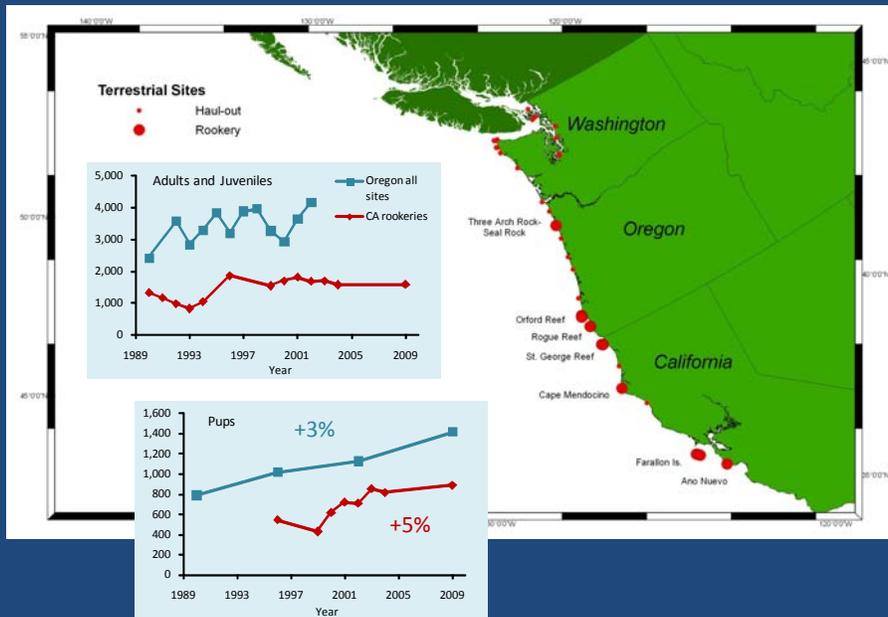


- Update Status of eastern DPS
- Vital Rates
  - Inferences from survey data
  - Preliminary mark-resight (branding) estimates
- New Food Habits Information

## Eastern Stock of Steller Sea Lion (North)



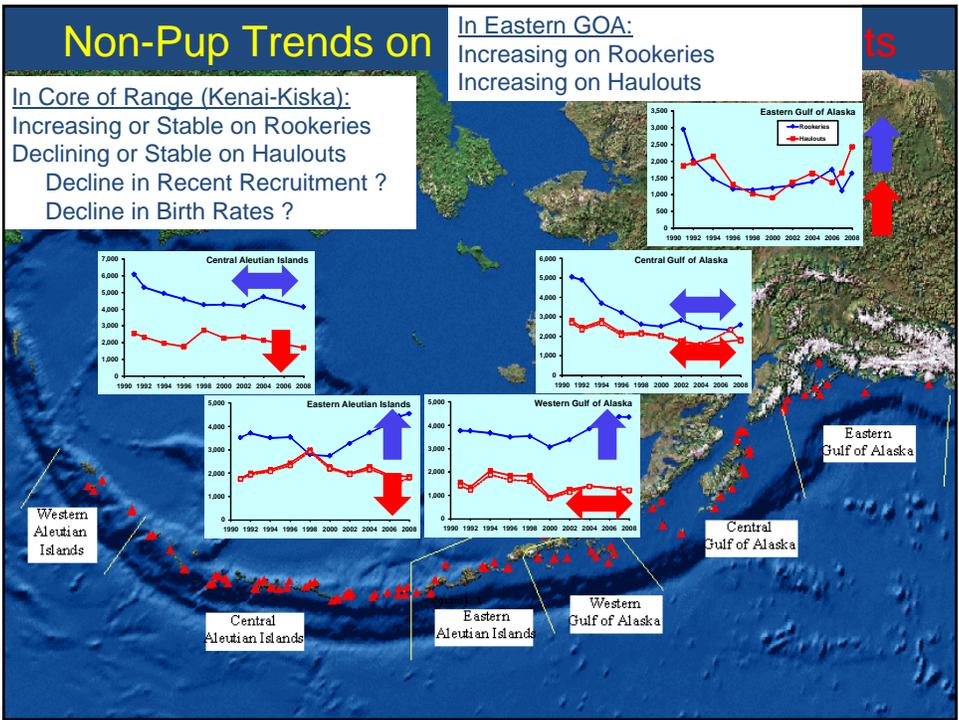
## Eastern Stock of Steller Sea Lion (South)



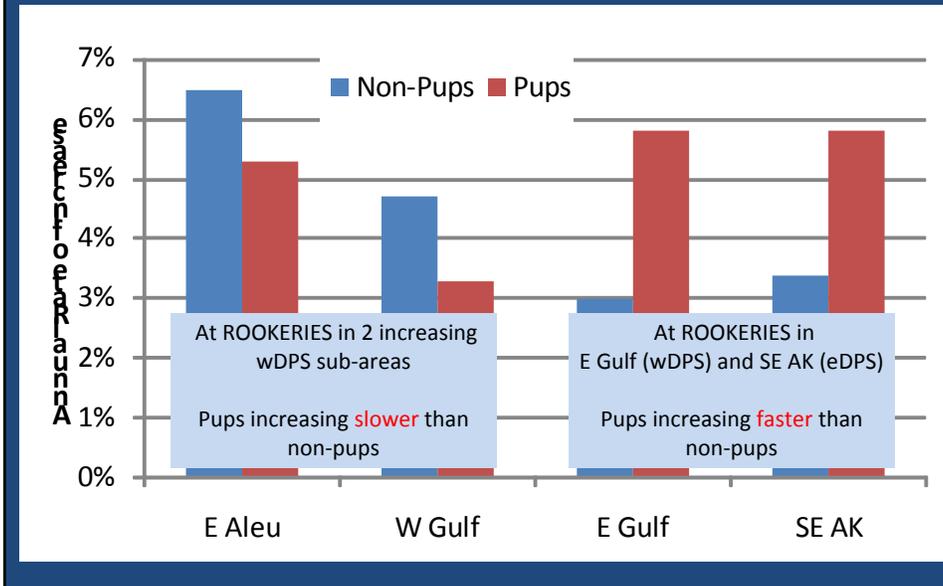
# Outline



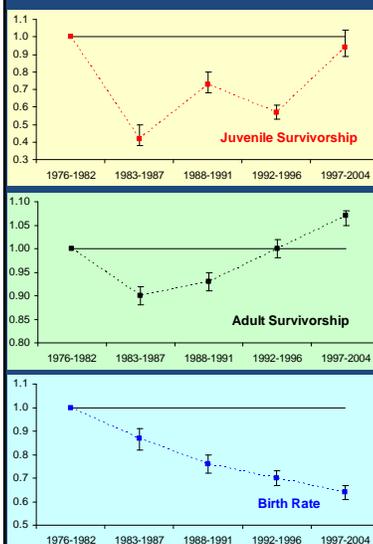
- Vital Rates
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## Trends in Pups and Non-Pups on Rookeries Only in Increasing Sub-Areas 2000-2009

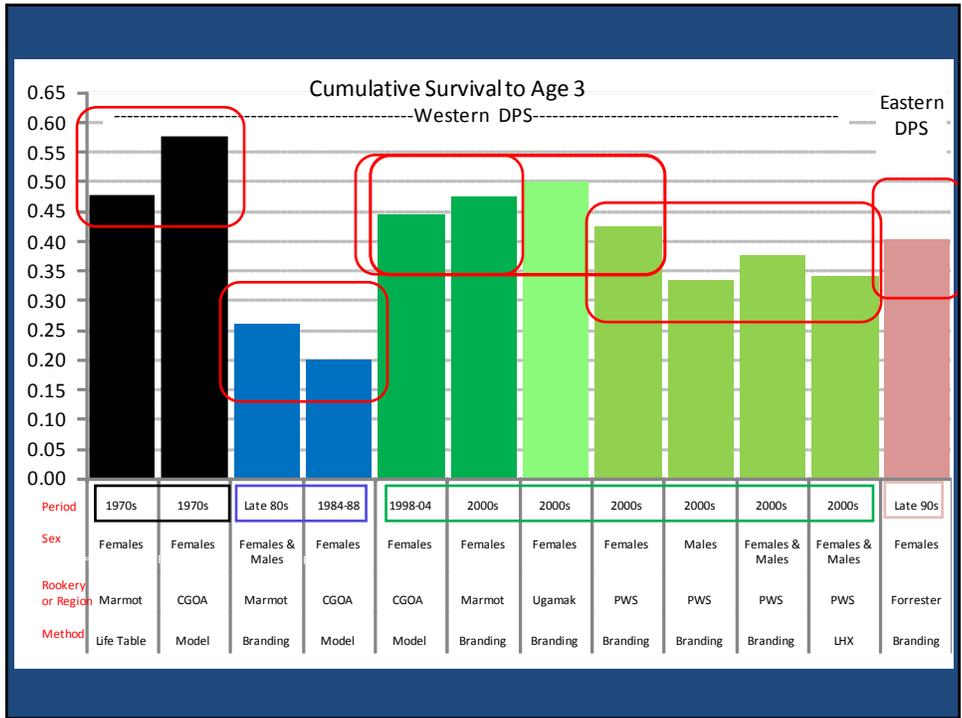


## Central Gulf of Alaska Survivorship and Natality



- Started with mid-1970s life table
- Fit changes in Pup and Non-pup Counts and Size Distribution on Haulouts by changing Vital Rates
- Since late 1980s
  - Increasing survivorship
  - Decreasing birth rate

Holmes, Fritz, York, and Sweeney.  
Dec 2007 Ecological Applications



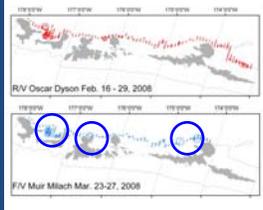
## Outline

- New Food Habits Information



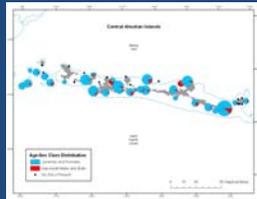
## A Cooperative Pollock Acoustic Biomass Survey for Management of Fisheries Interactions with Steller Sea Lions in the Aleutian Islands

Elizabeth Logerwell and Steve Barbeau – NOAA Fisheries/Alaska Fisheries Science Center  
 Lowell Fritz – NOAA Fisheries/National Marine Mammal Laboratory



### Pollock Acoustic Surveys

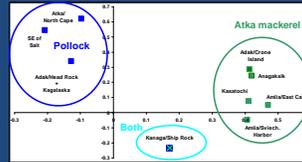
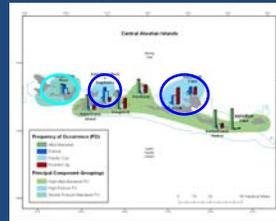
- ~ 29,000 mt of pollock
- 3 spawning aggregations



### Steller Sea Lion Aerial Survey

- 24-25 March 2008
- Total count = 3,236 sea lions
- 90% were adult females or juveniles

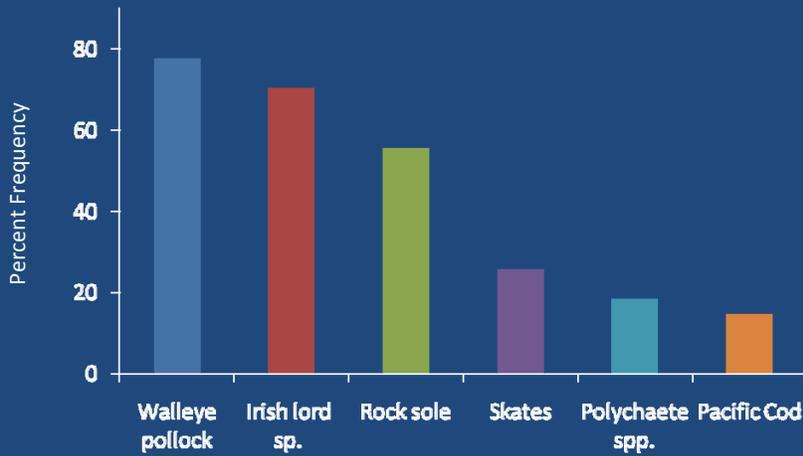
To investigate the feasibility of cooperative pre-fishery biomass surveys as a means to manage fisheries at local scales important to Steller sea lions



### Steller Sea Lion Food Habits

- 2-12 April 2008
- Atka mackerel, Rockfish spp. Pacific cod and pollock most common prey
- Principal component analysis of top 7 prey revealed 3 groups of sites
  - High pollock/Low mackerel, all located near spawning aggregations
  - High pollock/High mackerel (Kanaga-Ship Rock)
  - Low pollock/High mackerel, none near spawning aggregations

Percent frequency of occurrence of prey species found in Steller sea lion scat samples collected at Dalnoi Point, St. George Island, June 2009 (n = 27 scats).



Walleye pollock size ranged from 41.6cm to 73.7cm based on regressions of bones recovered from scat samples (n= 14 bones from 6 scat samples).

## Summary



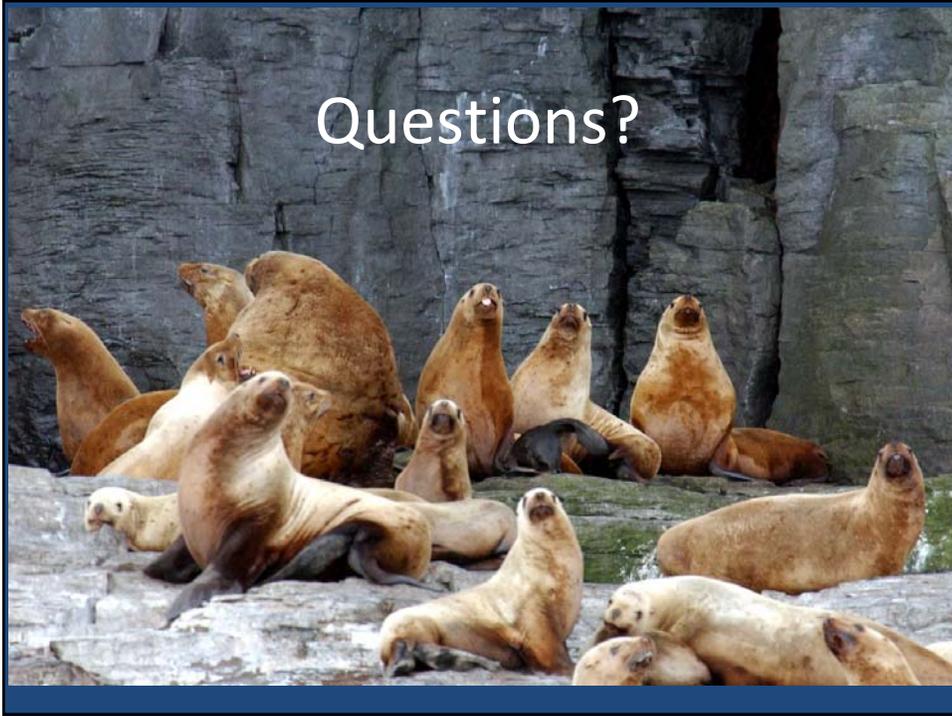
- Update Status of western DPS
  - Increased from 2000-2004
  - Stable from 2004-2008/9
  - Considerable regional variability in recent trends and responses in the population
    - Continued declines west of 178°W in the Aleutians
    - Stable 170-178°W in the Aleutians
    - Increasing eastern Aleutians and western Gulf
    - Stable central Gulf
    - Increasing eastern Gulf
  - Regional differences in vital rate responses
    - Eastern Aleutians through Eastern Gulf
      - Improvements in survival from 80s through 2000s
      - Evidence for reductions in natality,
    - Western and Central Aleutians
      - Unknown, but likely continued decline in all vital rates
- Update Status of eastern DPS
  - Continued improvement central CA through SE AK

## NMML SSL Research in 2010



- Population Assessment
  - Aerial Survey in Alaska: June and early July
  - Adults and Juveniles (Non-Pups)
  - Both 'early' and 'late' surveys in northern Gulf
- Survival and Reproduction
  - Sightings of marked animals: Summer
    - Boat-based eastern Aleutian Islands through PWS
    - Cape St. Elias: early June
    - Field camps on Marmot and Ugamak Islands
  - Permanent marking of pups in central Gulf: July
    - 100 on Marmot and 100 on Sugarloaf
- Adult female capture (possible)
  - Fall 2010 or Late Winter 2011

Questions?



## Kayak Island 9-13 June







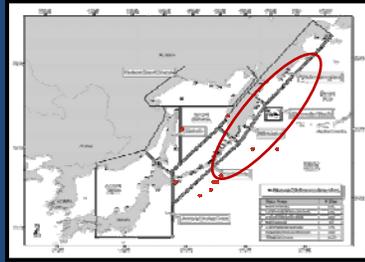
- 857 total adult and juvenile SSLs
  - 1400 aerial on 9 June 2008
- 38 branded animals
  - 31 western stock brands
    - 17 1-year-olds from Marmot, Sugarloaf & Chiswell
    - 3 2-3 year olds, 11 4-8 years old
  - 7 eastern stock brands 3-6 years old
  - ~ ¼ of SSLs from the east
    - Ratios of those seen to those alive

### SSL (non pups) Abundance in Western Bering Sea, 1982-2008

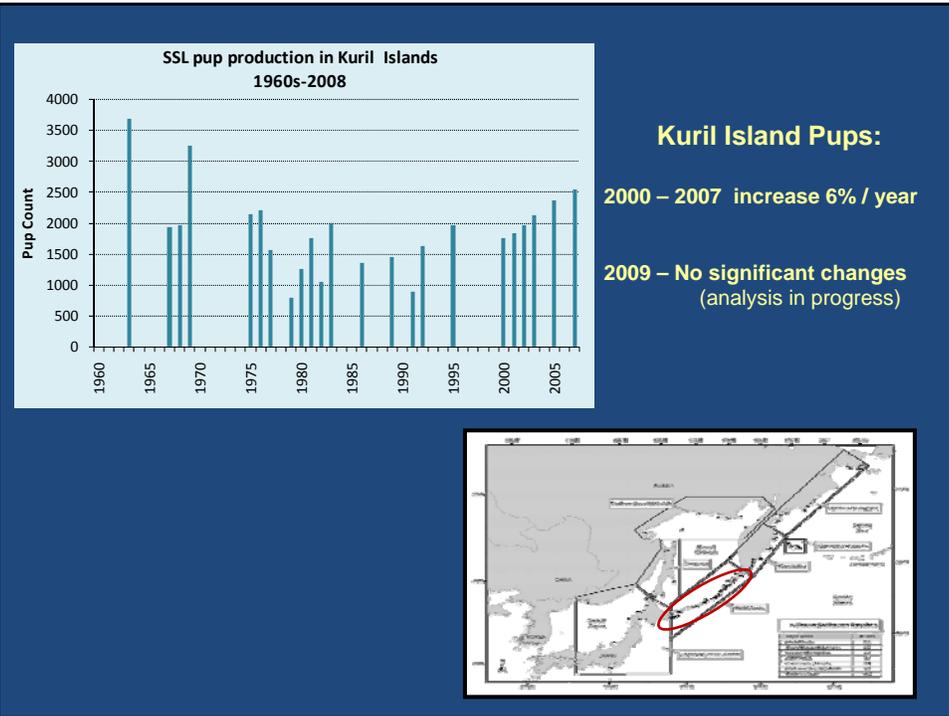
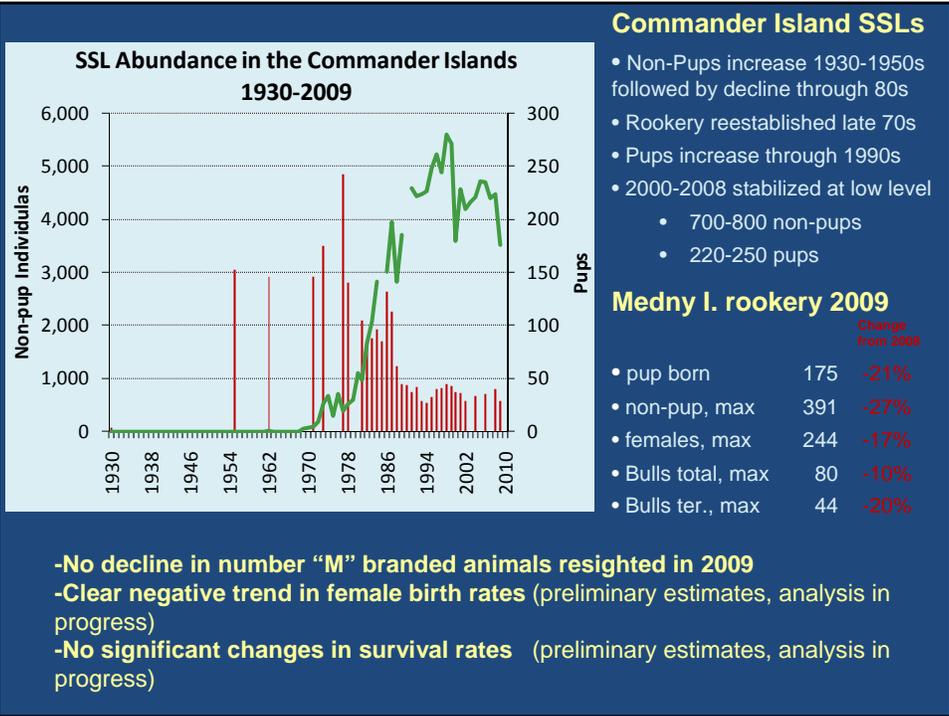
| Year | Individuals |
|------|-------------|
| 1982 | 4800        |
| 1983 | 3200        |
| 1984 | 3500        |
| 1985 | 1200        |
| 1986 | 1100        |
| 1987 | 1000        |
| 1988 | 1000        |
| 1989 | 1000        |
| 1990 | 1000        |
| 1991 | 1000        |
| 1992 | 1000        |
| 1993 | 1000        |
| 1994 | 1000        |
| 1995 | 1000        |
| 1996 | 1000        |
| 1997 | 1000        |
| 1998 | 1000        |
| 1999 | 1000        |
| 2000 | 1000        |
| 2001 | 1000        |
| 2002 | 1000        |
| 2003 | 1000        |
| 2004 | 1000        |
| 2005 | 1000        |
| 2006 | 1000        |
| 2007 | 1000        |
| 2008 | 1000        |
| 2009 | 1000        |

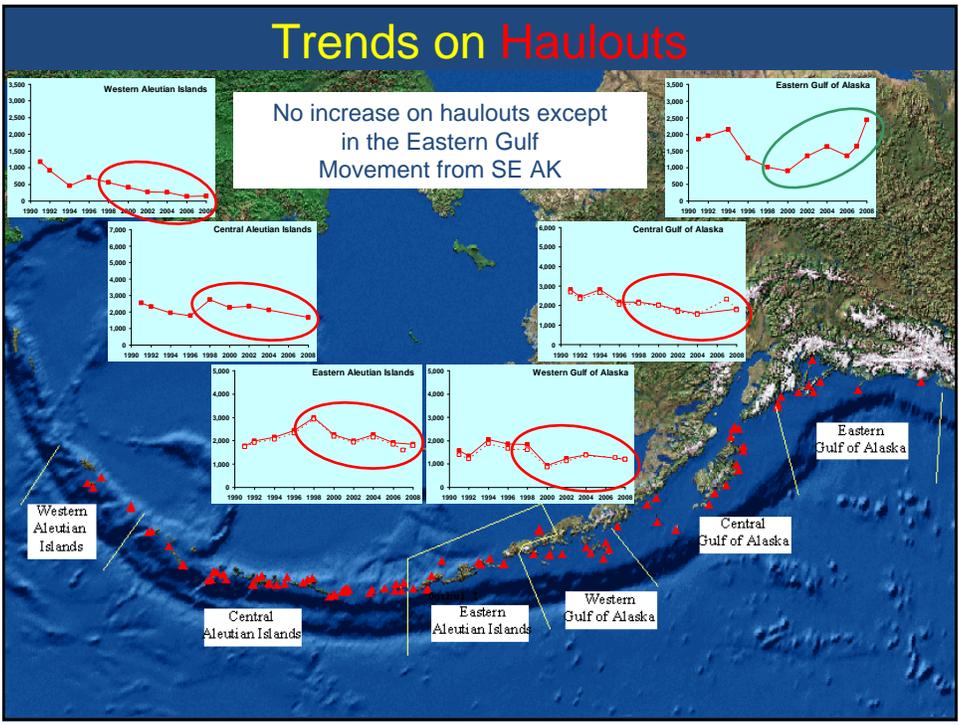
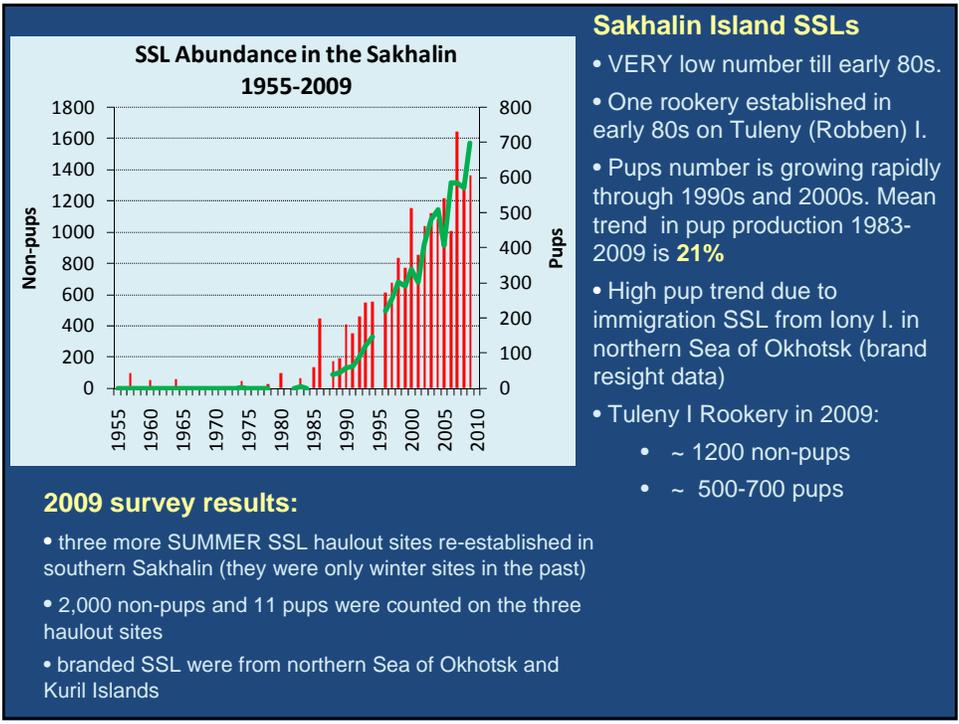
**Western Bering Sea Non-Pups**  
98% decline since 1982

### Eastern Kamchatka Non-Pups -81% decline since 1983



| Year | Individuals |
|------|-------------|
| 1983 | 2100        |
| 1984 | 1700        |
| 1985 | 1500        |
| 1986 | 1500        |
| 1987 | 800         |
| 1988 | 700         |
| 1989 | 600         |
| 1990 | 600         |
| 1991 | 600         |
| 1992 | 600         |
| 1993 | 600         |
| 1994 | 600         |
| 1995 | 600         |
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| 2004 | 600         |
| 2005 | 600         |
| 2006 | 600         |
| 2007 | 600         |



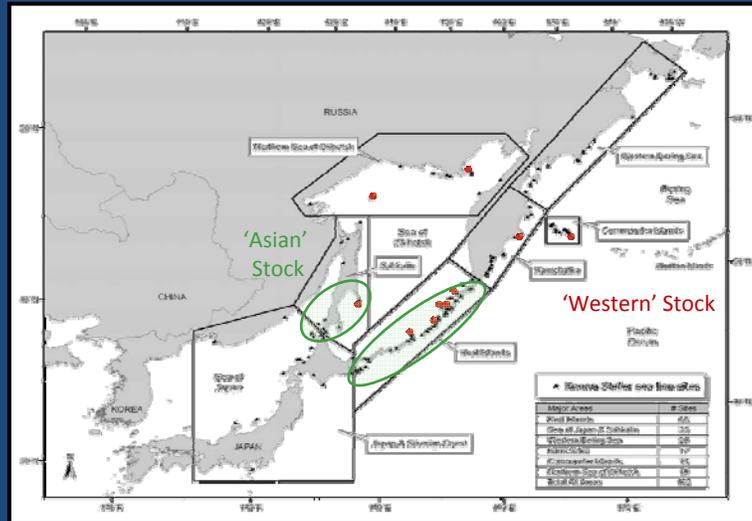


## SSL survey areas in Russian waters

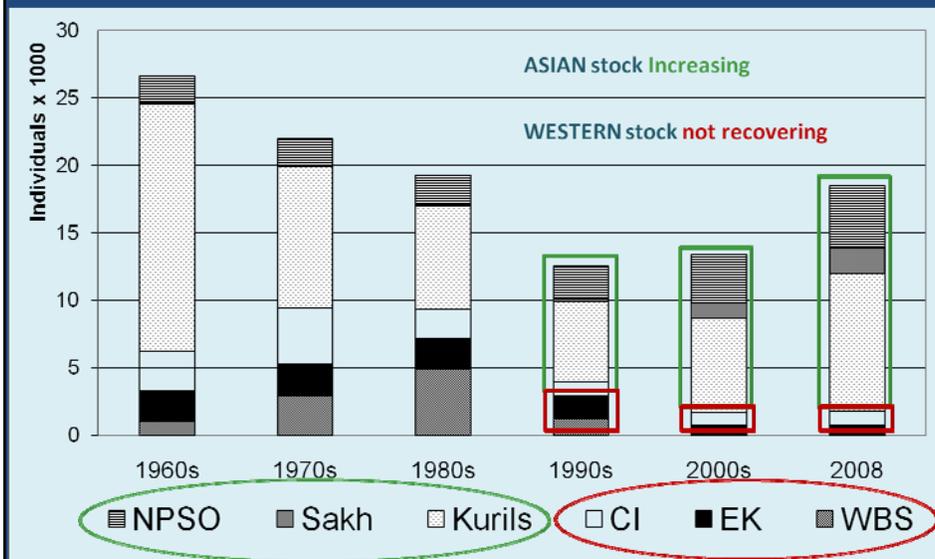
V. Burkanov

(Work funded by NMML and ASLC)

-Six survey areas are established in Russian waters for surveys.



## Total SSL Abundance in Russia:



Burkanov, V. et al. Update on Steller sea lion surveys in Russia, 2006-2008. Poster at AK Marine Science Symposium. Jan. 22, 2009

