

Herring Fisheries in Southeast Alaska

2012 Report to the Alaska Board of Fisheries

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by

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Topics

- Proposals before the board
- Historical review of fisheries
- Review of herring management plan
- Threshold and harvest rate approach
- Stock assessment

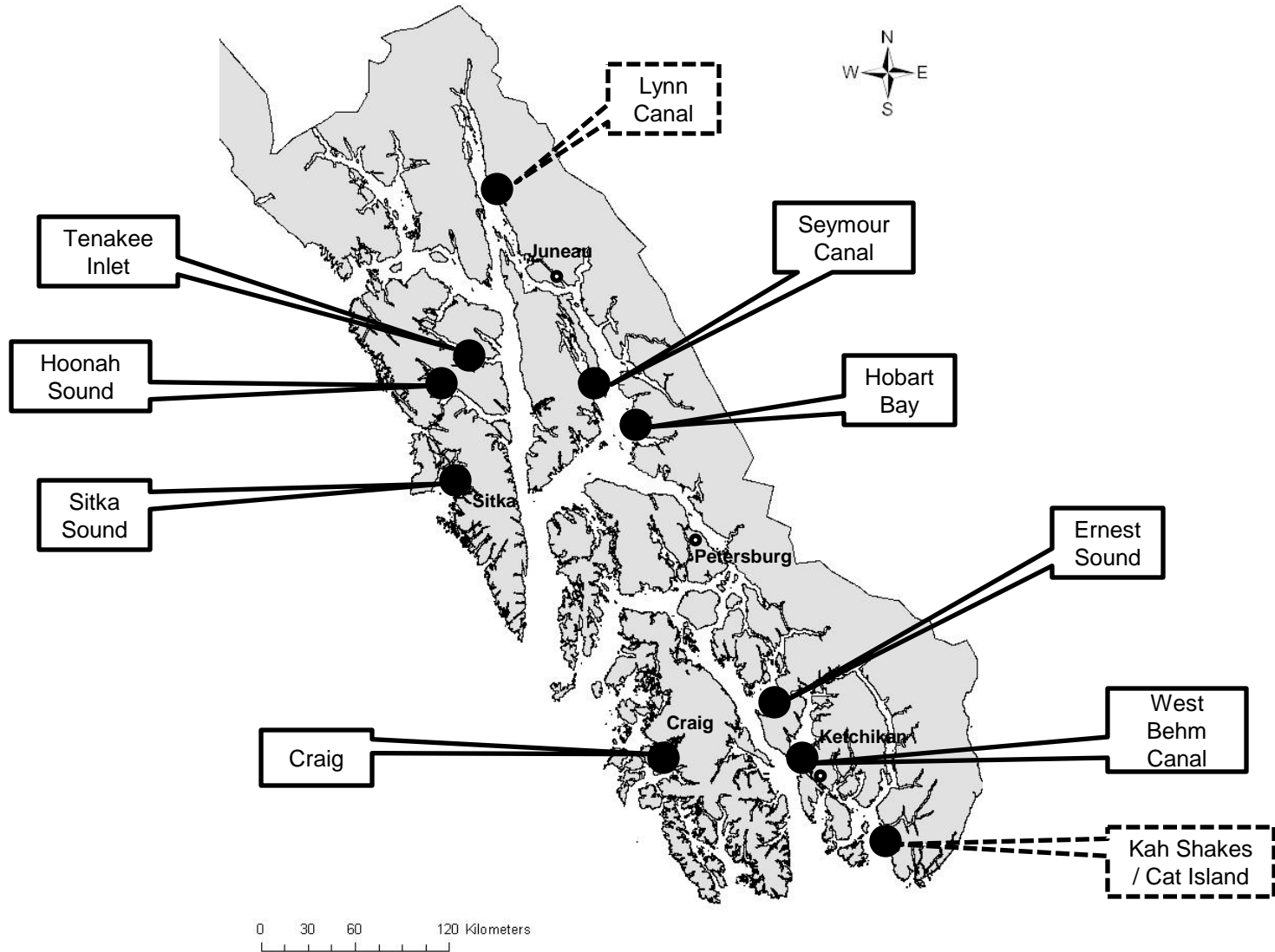
22 Herring Proposals

- Spawn on Kelp
 - 225: Spawn on kelp, combine pounds (*NEUTRAL*)
 - 226: Spawn on kelp, removal/marketing of pounds (*SUPPORT*)
- Gillnet Sac Roe
 - 227: WBC seine only for EQS fishery (*SUPPORT*)
 - 228/229: Remove gillnet mesh size restriction (*SUPPORT*)
- Seine Sac Roe
 - **230: Add criteria to management plan** (*OPPOSED*)
 - 231: Close sac roe fishery when within 10% of GH L (*OPPOSED*)
 - **232: Change harvest rate equation** (*OPPOSED*)
 - **233/234: Equal quota share fishery** (*NEUTRAL*)
 - **235: Restrict vessels entry into fishery area** (*OPPOSED*)
 - 236/237: Reduce purse seine size (*NEUTRAL*)

Herring Proposals

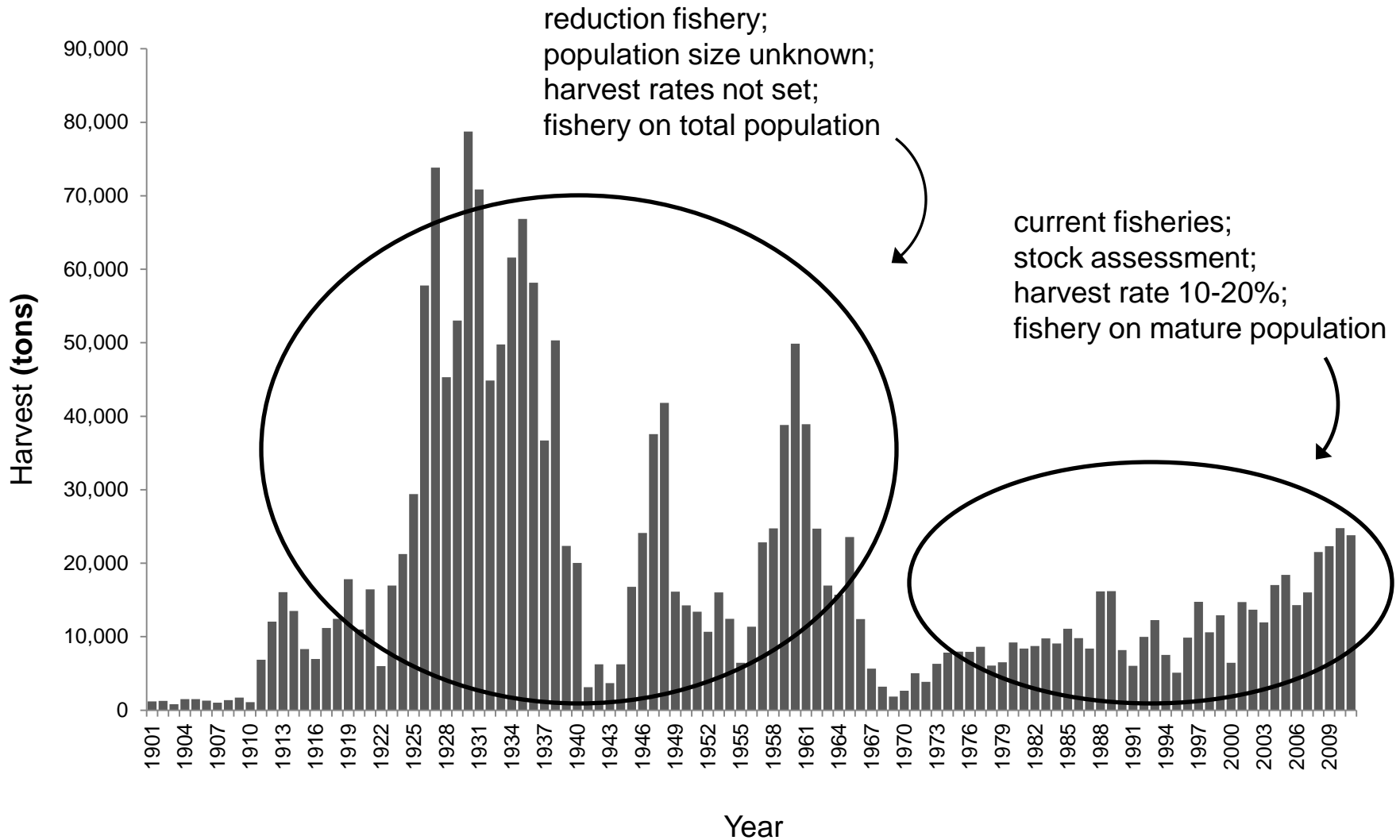
- Allocation
 - 240: Reallocate from Sitka sac roe to bait fishery (*NEUTRAL*)
 - 241: Reallocate District 10 bait to sac roe fishery (*NEUTRAL*)
 - 242: Raise threshold in West Behm Canal (*NEUTRAL*)
 - 243/244: Reallocate WBC from purse seine to gillnet only (*NEUTRAL*)
 - 245: Share catch among permit holders during EQS in WBC (*OPPOSED*)

Location of Major State-managed Herring Stocks in Southeast Alaska

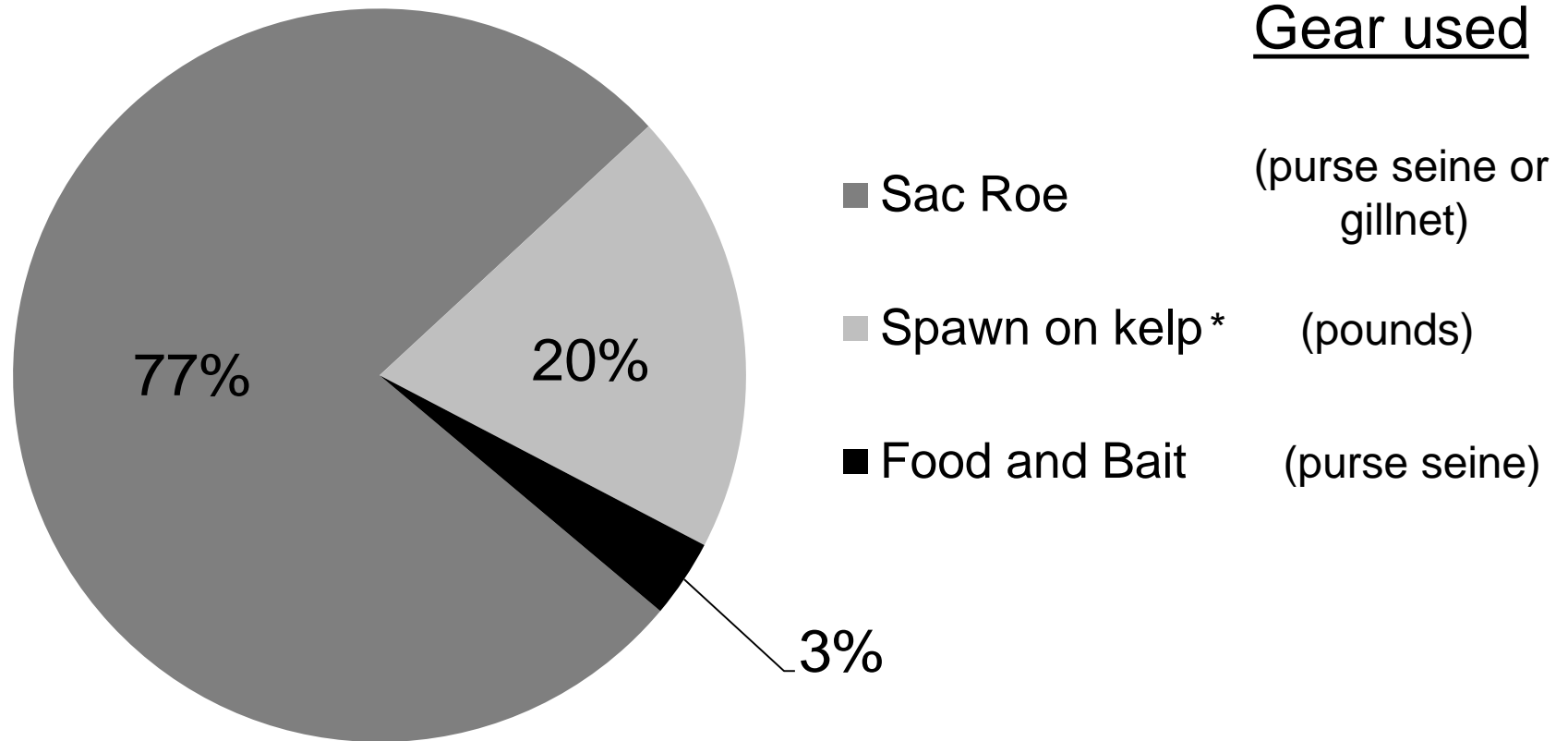


dashed labels = inactive fisheries

Total Herring Harvest in Southeast Alaska, 1900-2011

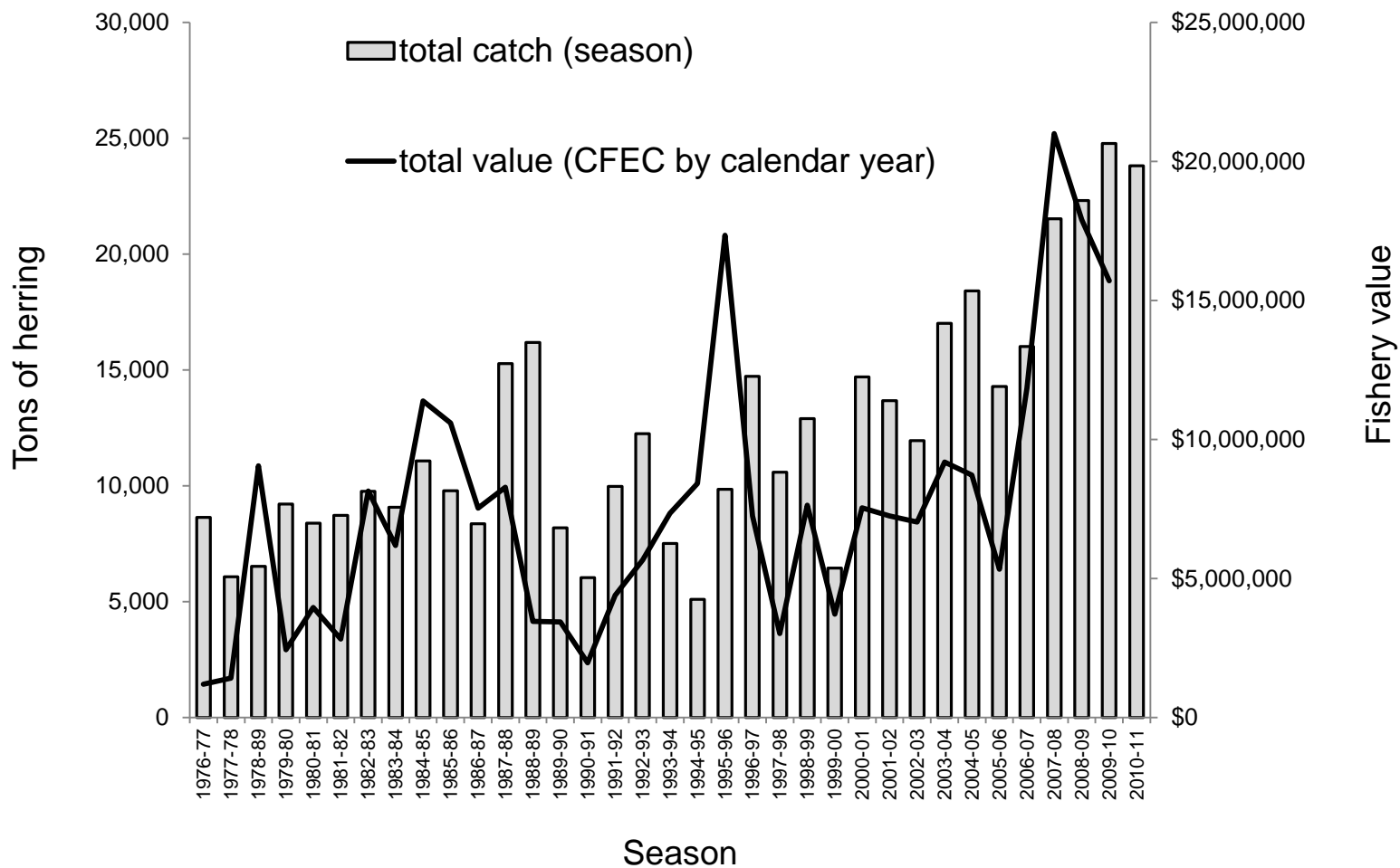


Percent of Southeast Alaska Herring Harvest by Fishery (average of last 5 years)



*expressed as herring equivalent

Historic Harvest and Exvessel Value



Southeast Herring Management Plan (5 AAC 27.190)

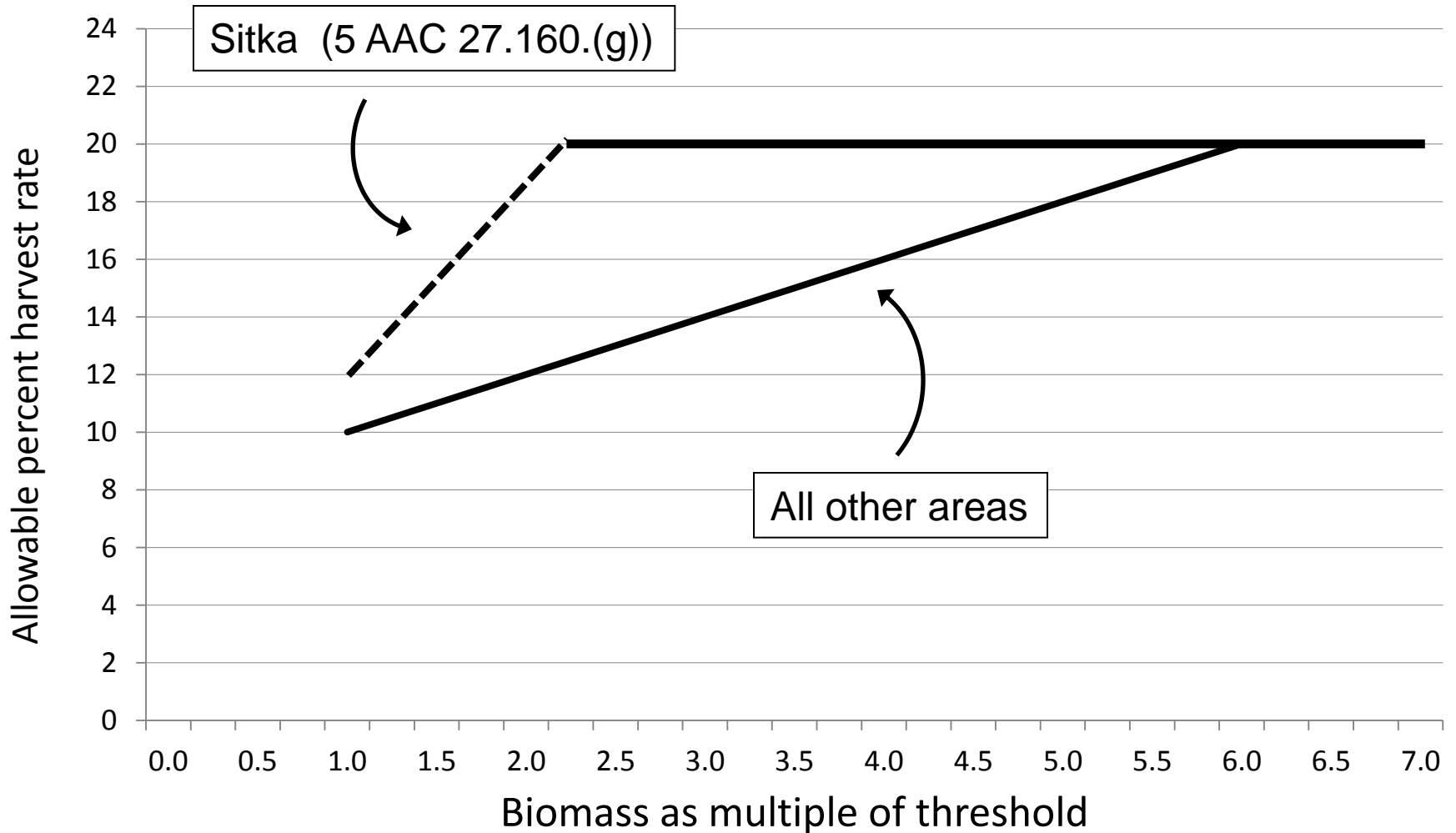
For management of herring, the department shall:

- 1) Identify stocks on a spawning area basis;
- 2) Establish minimum spawning biomass thresholds;
- 3) Assess abundance of mature herring before fishing;
- 4) Exploitation rate between 10% and 20%;
- 5) Consider sources of mortality; and
- 6) Modify fishing periods to minimize incidental mortalities.

Thresholds

- Goals
 - maintain stocks at productive levels
 - ensure spawning base for reproduction / future recruitment
 - provide forage for predator species
- Established based on two approaches:
 - 25% of estimated average unfished biomass
 - Sitka Sound, West Behm Canal
 - For Sitka Sound, BOF adjusted upward to address subsistence concerns
 - Set using estimates of historical abundance and fishery management limits
 - Used for all other stocks

Sliding Scale Harvest Rate



Stock Assessment

- Estimates of spawning biomass
 - Aerial surveys
 - Egg deposition surveys (dive survey)
- Age / Weight / Length (AWL)
 - Spawning population
 - Commercial fishery
- Data are input into one of two models to forecast

Two models used to forecast herring biomass:

1) Age Structured Analysis (ASA)

data inputs: egg deposition (all years)
catch age composition (all years)
spawning age composition (all years)
weight at age (all years)
fecundity at age
harvest

1-year
biomass
forecast

Sitka, Seymour,
Craig, Tenakee

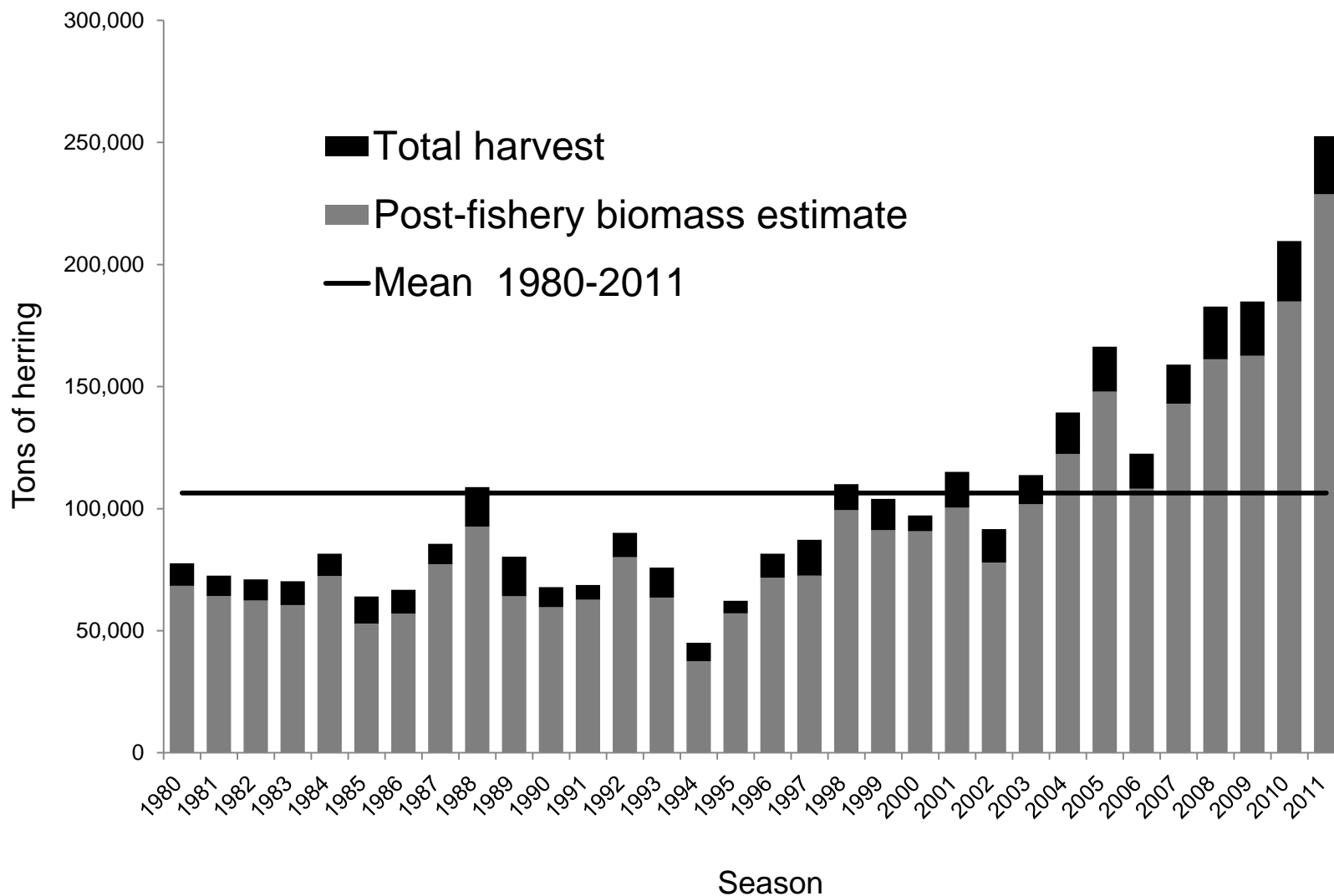
2) Biomass Accounting

data inputs: egg deposition (one year)
spawning age composition (one year)
weight at age (one year)
recruitment (median of historical)
survival/maturity/fecundity (borrowed ASA area)

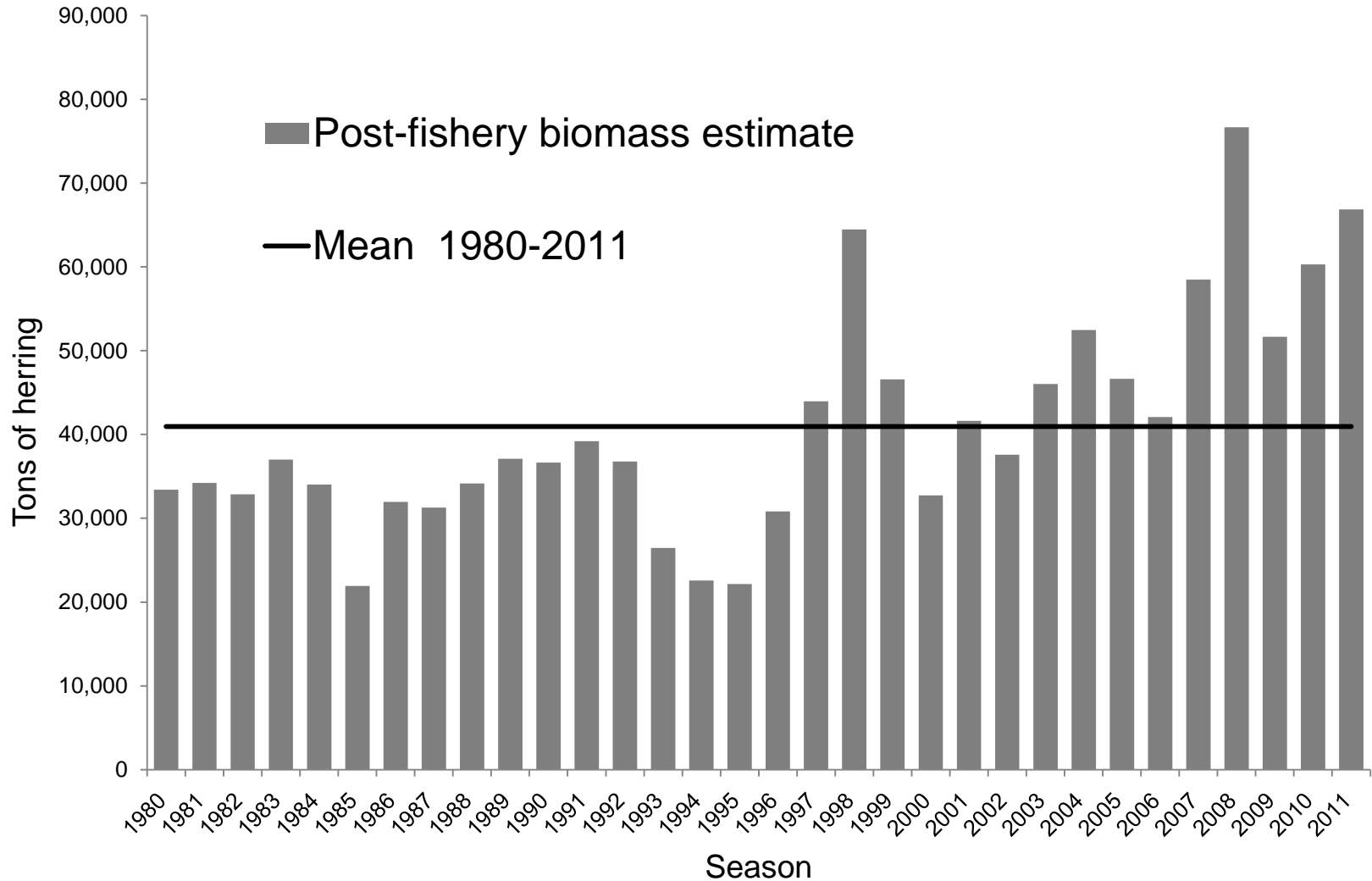
1-year
biomass
forecast

Hoonah Sound,
West Behm Canal,
Ernest Sound,
Hobart Bay

Southeast Alaska Total Herring Abundance Estimates and Harvest (major stocks): 1980-2011



Southeast Alaska Total Herring Abundance Estimates (major stocks) Excluding Sitka Sound: 1980-2011



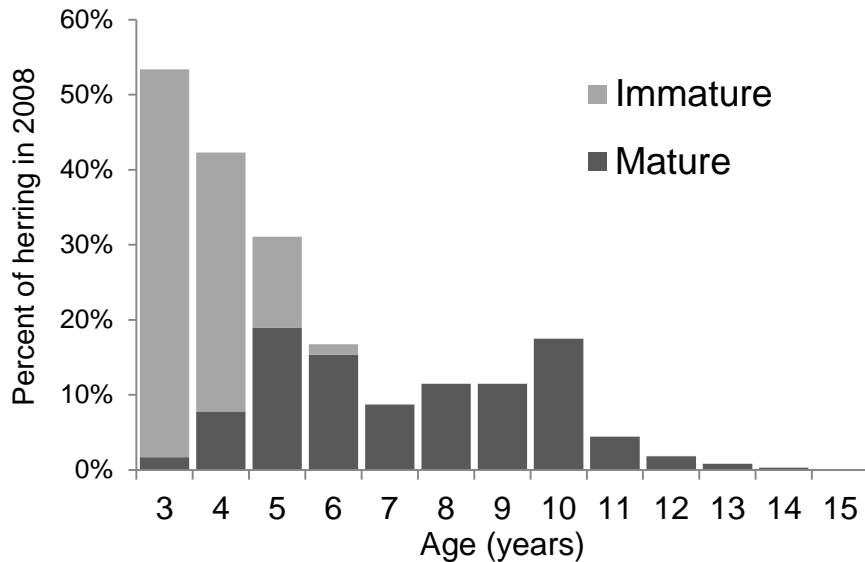
Herring Age Composition

- At 2009 Board of Fisheries meeting, department presented growing stock abundance, despite little or no mature age-3 recruitment or age-4 herring.
- Interpretation was age-3 and 4 herring were present in population as immature, and maturing as older fish, so not observed in spawning population until age 5 or 6.
- In November 2010, department discovered that method of scale reading had gradually drifted over period 1999-2010, leading to over-aging by 1-3 years.
- Since discovery of error, method was reestablished, checking procedure put in place, and re-reading all 1999-2010 scales has been underway; most stocks now completed, but still in progress.
- Effects of using re-aged scales:
 - Age-3 and 4 mature herring were present in spawning population.
 - Abundance trends did not change, but explanation did (i.e., instead of maturing later with high survival, maturing earlier with lower survival).

Age composition

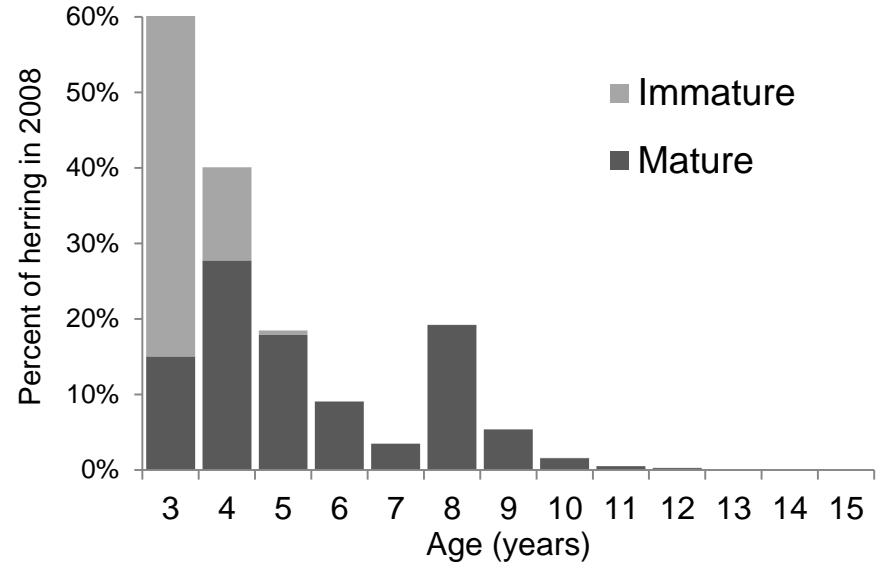
Sitka Sound 2008

Original ages



Low maturity rate;
High survival rate

After re-aging



Higher maturity rate;
Lower survival rate