



NOAA
FISHERIES

Alaska Fisheries Science Center

Protected Species Science Program Review

Theme 1: Information Needs

Alaska Marine Mammal Stock Assessment Reports



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Outline

Introduction

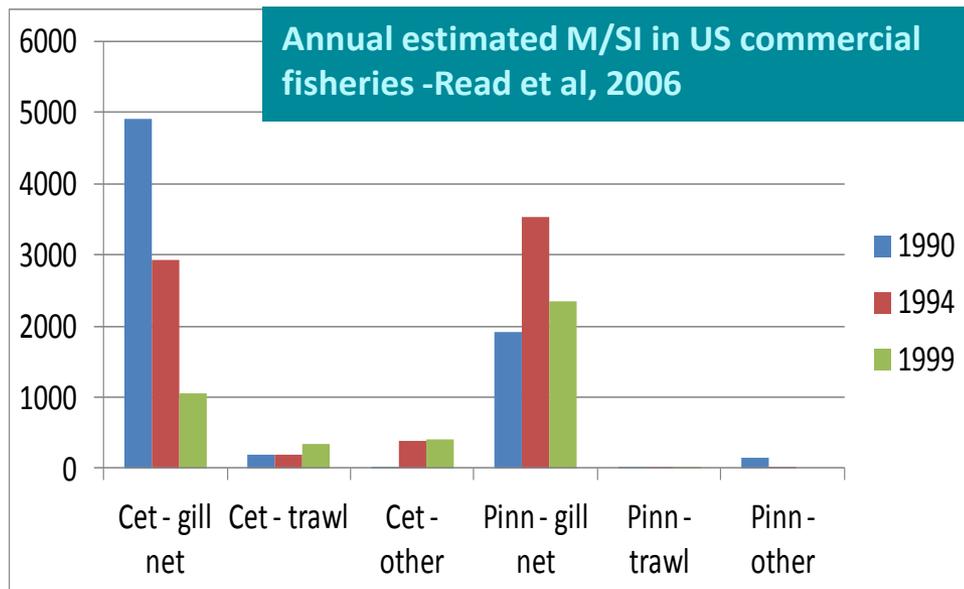
Data types

- Abundance, distribution, stock structure
- Mortality/serious injury
 - Observer programs
 - Opportunistic information
 - Harvest data

Summary and recommendations

Reduction of marine mammal bycatch

Key goal of the Marine Mammal Protection Act: reduce “serious injury and mortality” to insignificant levels approaching a zero mortality and serious injury rate.



MMPA sections 117 and 118

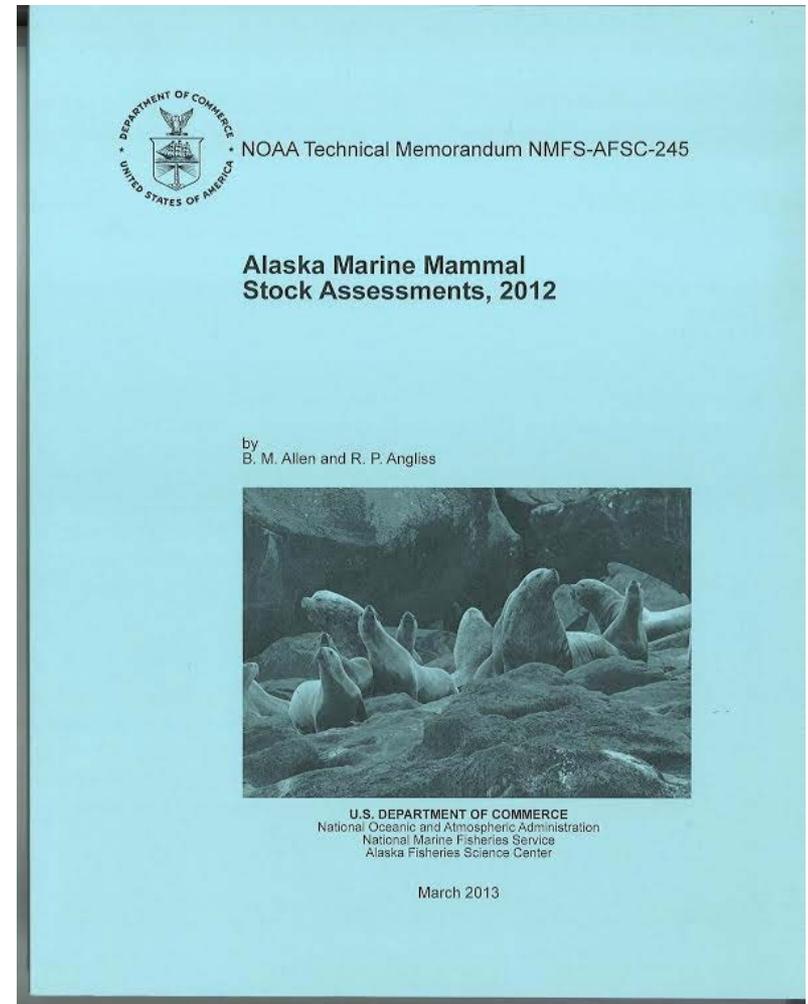
- ❑ 117 → Develop stock assessment reports
- ❑ 118 → Use the data in the stock assessment reports to rank fisheries based on level of serious injury/mortality relative to each stocks' Potential Biological Removal level

Stock Assessment Reports

Includes information on. . .

- Distribution
- Abundance
- Human-related mortality and serious injury

Calculation of Potential Biological Removal (PBR) level



Potential Biological Removal level

Definition: The maximum number of individuals from a marine mammal stock that can be removed and still allow the stock to achieve it's optimum sustainable population level

$$PBR = N_{min} * 0.5 R_{max} * Fr$$

N_{min} = Minimum population estimate

R_{max} = Maximum theoretical net productivity rate

Fr = Recovery factor

Excerpt of SAR data for key Alaska marine mammal stocks

(black = final 2013 SARs; gray = draft 2014 SARs)

Species	Stock	N (est)	N(min)	Survey interval/ year of last survey	PBR	Fish. mort.	Subs. mort.	Total mort.	Status
Beluga whale	Cook Inlet	312	280	1/2012	UND	0	0	0	S
Bowhead whale	W. Arctic	12,631	10,314	8/2004	103	0.4	39	39.4	S
Harbor porpoise	SE Alaska	11,146	9,116	15/1997	UND	22.6	0	22.6	S
Harbor seal	Aleutian Islands	3,579	3,313	7/2004	99	1.0	90	93.1	NS
Bearded seal	Alaska	N/A	N/A	(partial)	N/A	1.8	6788	6790	S
Ringed seal	Alaska	N/A	N/A	(partial)	N/A	4.1	9567	9571	S
Northern fur seal	E. North Pacific	639,545	541,317	1/2011	11,638	4.6	463	471	S
Steller sea lion	E. U. S.	63,160-78,198	34,485	2/2011	1,552	49 ⁴	11.9	65.1	S
Steller sea lion	W. U. S.	45,659	45,659	1/2012	274	29.6	199	230	S

Stock Assessment Reports: Annual process

Reviews and updates by AFSC staff

- Annual updates for “strategic” stocks
- Reviews for other stocks every 3 years

Internal reviews

- NOAA Fisheries Alaska Region
- NOAA Fisheries HQ

External reviews

- Alaska Scientific Review Group
- Public

Alaska SRG

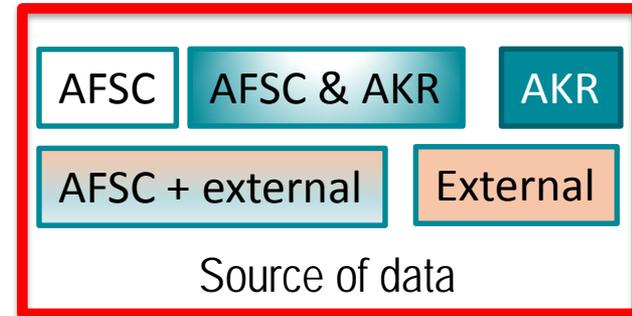
Lloyd Lowry, ADF&G (ret.)
Robert Suydam, North Slope Borough
Karl Haflinger, Sea State Inc
Beth Mathews, Univ. of Alaska, Southeast
Grey Pendleton, ADF&G
Kate Wynne, Univ. of Alaska, Fairbanks
Craig Matkin, North Gulf Oceanic Society
Kate Stafford, Univ. of Washington
Bob Small, ADF&G
Mike Miller, Sitka Tribe of Alaska
Dave Tallmon, Univ. of Alaska, Southeast



Final SARs posted on NOAA Fisheries HQ website after public comments addressed

Stock Assessment Reports: Sources of data

Abundance/distribution/
stock structure



Commercial fisheries
observer programs

Opportunistic
reports

Subsistence harvest

Stock Assessment Reports

Stock Assessment Reports: Data types

Distribution

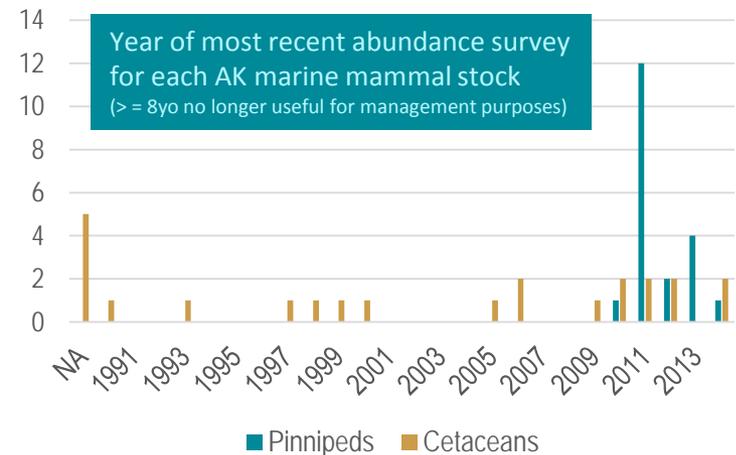
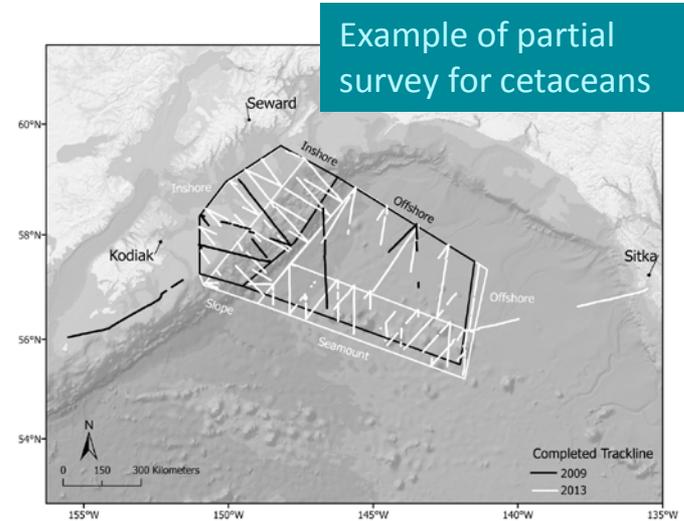
Abundance

Stock structure

From peer-reviewed literature

Information on distribution, abundance, and stock structure

Aspects	Explanation
Methods and partners	Use data available in peer reviewed publications and reports developed by AFSC, ADF&G, universities, etc.
Data quality	Reliance on published information ensures high quality of data.
Strengths	Over decades, have collected some information on distribution, abundance, and stock structure for many AK stocks.
Weaknesses	Often have only distribution and abundance on a portion of a stocks' range; information often dated (> 8yo).



Stock Assessment Reports:

Data types

Mortality/serious injury information

- Observer programs
 - Opportunistic information
 - Stranding data
 - Entanglement data
 - Subsistence harvest
 - Fisher self-reports
 - Research-related mortalities
- } Published in technical memoranda; administrative reports
- } Unpublished data, technical reports
- } Unpublished data

Observer programs: Mortality and serious injury incidental to Alaska commercial fisheries

Federally-regulated fisheries

- North Pacific Groundfish Observer Program
- Many fisheries observed annually

State fisheries

- Alaska Marine Mammal Observer Program
- Unfunded as of 2014

Species Group	Estimated annual M/SI in Alaska fisheries (2007-2011)
Cetaceans, gillnet	121
Cetaceans, trawl	2.8
Cetaceans, other	9
Pinnipeds, gillnet	15
Pinnipeds, trawl	53
Pinnipeds, other	37

Observer data analysis

Ratio estimation approach used to extrapolate observed M/SI (take) to total M/SI (take) using catch as the unit of fishing effort

$$TotalTake = \frac{ObservedTake}{ObservedEffort} \times TotalEffort$$

- Catch is used to estimate effort
- Stratify by statistical area, 4-week period, and processing sector (NPGOP)
- Special consideration (NPGOP)
 - No extrapolations to unsampled components of the fleet
 - Add - don't extrapolate - M/SI that occurs during an unsampled haul on an observed boat
- Results published periodically as NOAA tech memos

Observer programs in Alaska

Aspects	Federally-regulated fisheries	State-regulated fisheries
Methods and partners	<p>AFSC oversees data collection; AKR assigns fishery; AFSC conducts analysis</p> <p>Results published in tech memos; periodic external reviews</p>	<p>Contractors to AKR collect & analyze data</p> <p>Results in contract reports; reviewed by AKR and AFSC staff</p>
Data quality	<p>High level of observer coverage (10-100% of catch); large variance due to small #s of events</p>	<p>Low level of observer coverage (3-5%); large variance due to low observer coverage</p>
Strengths	<p>% observer coverage</p> <p>Funding is secure</p>	<p>Observers placed based on marine mammal management needs</p> <p>Ability to move program between state fisheries</p>
Weaknesses	<p>Observers placed based on fishery management needs</p>	<p>Rotating program through Cat II state fisheries would take 20+ years</p> <p>Funding no longer available</p>

Opportunistic information

Distinguishing between serious and non-serious injuries

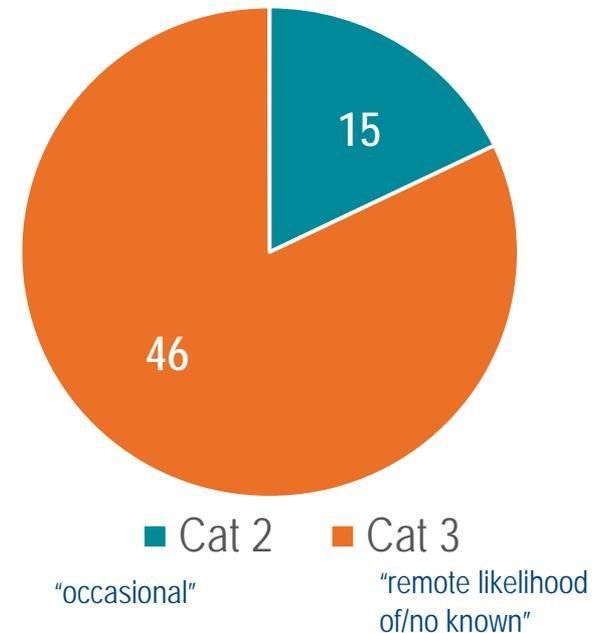
- Updated guidance for distinguishing serious injuries from non-serious injuries in 2012; first used in 2013 SARs
- Guidance is specific to three taxonomic groups (large cetaceans, small cetaceans, pinnipeds)
- Increased precision based on new information
- Allen, B. M., V. T. Helker, and L. A. Jemison. 2014. Human-caused injury and mortality of NMFS-managed Alaska marine mammal stocks, 2007-2011, 84 p.

Opportunistic information

Aspects	Explanation
Methods and partners	<p>AKR collects reports/forms for human-related injuries and mortalities; AFSC reviews data, assigns injury/serious injury; exchange records with other Centers to standardize decisions.</p> <p>Draft decisions re. serious/non-serious injuries between other Centers; reviewed by AKR, SRG.</p> <p>Results published in tech memos.</p>
Data quality	<p>Opportunistic; depends on level of data received from observer.</p>
Strengths	<p>Dramatic recent improvements in data management, structured decisionmaking, reviews of decisions, and making the information publically available.</p>
Weaknesses	<p>Represents minimum values – actual levels of mortality and serious injury is unknown. Data cannot be extrapolated.</p> <p>Injury determinations and assignment to cause is dependent on observer providing key information.</p>

Alaska commercial fisheries classification

List of Fisheries: Categorize each U.S. commercial fishery based on the level of mortality/serious injury of a particular stock relative to the PBR level of that stock. Management actions may be taken to reduce mortality/serious injury in certain Category II fisheries.



Category II fisheries (years observed)

- Bristol Bay salmon drift gillnet (never observed)
- Bristol Bay salmon set gillnet (never observed)
- Cook Inlet salmon set gillnet (1999, 2000)
- Cook Inlet salmon drift gillnet (1999, 2000)
- Kodiak salmon set gillnet (2002, 2005)
- AK Peninsula/Aleutian Islands salmon drift gillnet (1990)
- AK Peninsula/Aleutian Islands salmon set gillnet (never observed)
- Prince William Sound salmon drift gillnet (1990,1991)
- AK Southeast salmon drift gillnet (2012, 2013)
- Yakutat salmon set gillnet (2007,2008)
- Cook Inlet salmon purse seine (never observed)
- Kodiak salmon purse seine (never observed)
- BSAI flatfish trawl (annual)
- BSAI pollock trawl (annual)
- BSAI rockfish trawl (annual)

List of Fisheries

Observed Category 3 fisheries

- GOA groundfish trawl
- GOA flatfish trawl
- GOA Pacific cod trawl
- GOA rockfish trawl
- GOA Atka mackerel trawl
- GOA longline
- GOA Pacific cod longline
- GOA rockfish longline
- GOA halibut longline
- GOA finfish pot
- BSAI finfish pot
- BSAI Pacific cod pot
- BSAI longline
- BSAI Greenland turbot longline
- BSAI Pacific cod longline
- BSAI Pacific halibut longline
- BSAI rockfish longline
- BSAI sablefish longline
- BS sablefish pot
- AI sablefish pot
- Prince William Sound salmon set gillnet

Number of Category 3 fisheries that have never been observed: 25

Subsistence harvest data

Aspects	Explanation
Methods and partners	Obtain data primarily from Alaska Native Organization Commissions and Councils; AKR is the lead for compiling and providing information
Data quality	Varied
Strengths	Reliable estimates of harvest (+ struck/lost) for some stocks
Weaknesses	Variation in programs for collecting harvest data; some estimates are outdated

Summary and recommendations

- SARs are focused on providing basic data for management of incidental mortality/serious injury in commercial fisheries
- Many abundance estimates for Alaska marine mammal stocks are unavailable or outdated
- Focus on using published information and many reviews → high quality assessments

Recommendation 1: Collect basic data needed for each stock assessment report.

Recommendation 2: Consider whether SARs should be updated (nationally) to provide data for uses other than management of incidental mortality/serious injury in commercial fisheries.