

Variability and trends in subsistence harvests of ice seals in the Yukon-Kuskokwim Delta region, Alaska, 1962–2018—SUMMARY

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Abstract

Ringed, bearded, spotted, and ribbon seals, called ice seals, are harvested for subsistence by many Alaska Native communities. Ringed and bearded seals are listed as threatened under the Endangered Species Act. We investigated variability and trends in the subsistence harvest of ice seals in the Yukon-Kuskokwim Delta region over the last fifty years. Using bounty data, collected during 1962–1972 by the State of Alaska, we identified a regional pattern that was likely shaped by variability in weather and sea ice conditions, the value of seal skins, and the level of participation in the bounty. We compared household survey data collected infrequently between 1997–2018 to the bounty data. The mean total harvest estimate from household surveys was slightly lower than during the bounty period, but the human population doubled, resulting in a substantial decline in the mean number of seals harvested per person. Three communities where household surveys were conducted during 2008–2018 (Hooper Bay, Tununak, and Quinhagak) showed declines in seal harvests during this ten-year period. Ongoing sea ice loss appears to be driving a decline in harvest across the region. Recent data also suggest the declining harvest for some communities is driven by reduced participation in hunting and less use of seal products, not by declining seal populations. Current population estimates indicate all four species are abundant in Alaskan waters, and most hunters have not observed changes in seal abundance.

The study area



Figure 1. Coastal communities in the Yukon-Kuskokwim Delta region from which hunters regularly harvest ice seals. We examined data from the bounty period (1962–1972, orange circles), and from household surveys (1997–2018, stars within circles).

Key findings:

- **Previously (in the Ice Seal Harvests are Sustainable Paper) we showed that the subsistence harvests of ice seals are currently sustainable and not considered a threat to seal populations. This paper is the next step and shows that trends in harvest are either stable or declining. Seal populations remain abundant, therefore there is no evidence that restrictions to harvest are warranted.**
- Comparing harvest data from the bounty period (1962–1972) to more recent household surveys (1998–2018) for seven communities showed only small changes in total harvest between the two periods (Fig. 4). However, the human population has doubled during that time such that the number of seals harvested per capita (= per person) has declined by more than half.
- Changing weather and sea ice conditions, as well as social and economic changes, are likely contributing to reduced or stable harvest levels despite a larger human population.
- Declines in harvest (Fig. 5) and declines in the number of households with active hunters and that use seal products (Fig. 6) were observed for Hooper Bay, Tununak, and Quinhagak in recent years.
- Struck and lost levels may be lower now than in the past. Recent estimates range from 0–30%.
- Continued and better documentation of the harvest is important for monitoring how environmental and anthropogenic changes will affect harvests and use of ice seals in the future.
- Future harvest monitoring should focus on communities that harvest the most seals regionally.

Important figures:

Figure 4

Figure 4 shows:

- Changes in harvest level over time varied by community.
- Overall, more recent total harvests (top) have only slightly changed from harvests during the bounty period, but during this time, the human population has doubled (bottom).

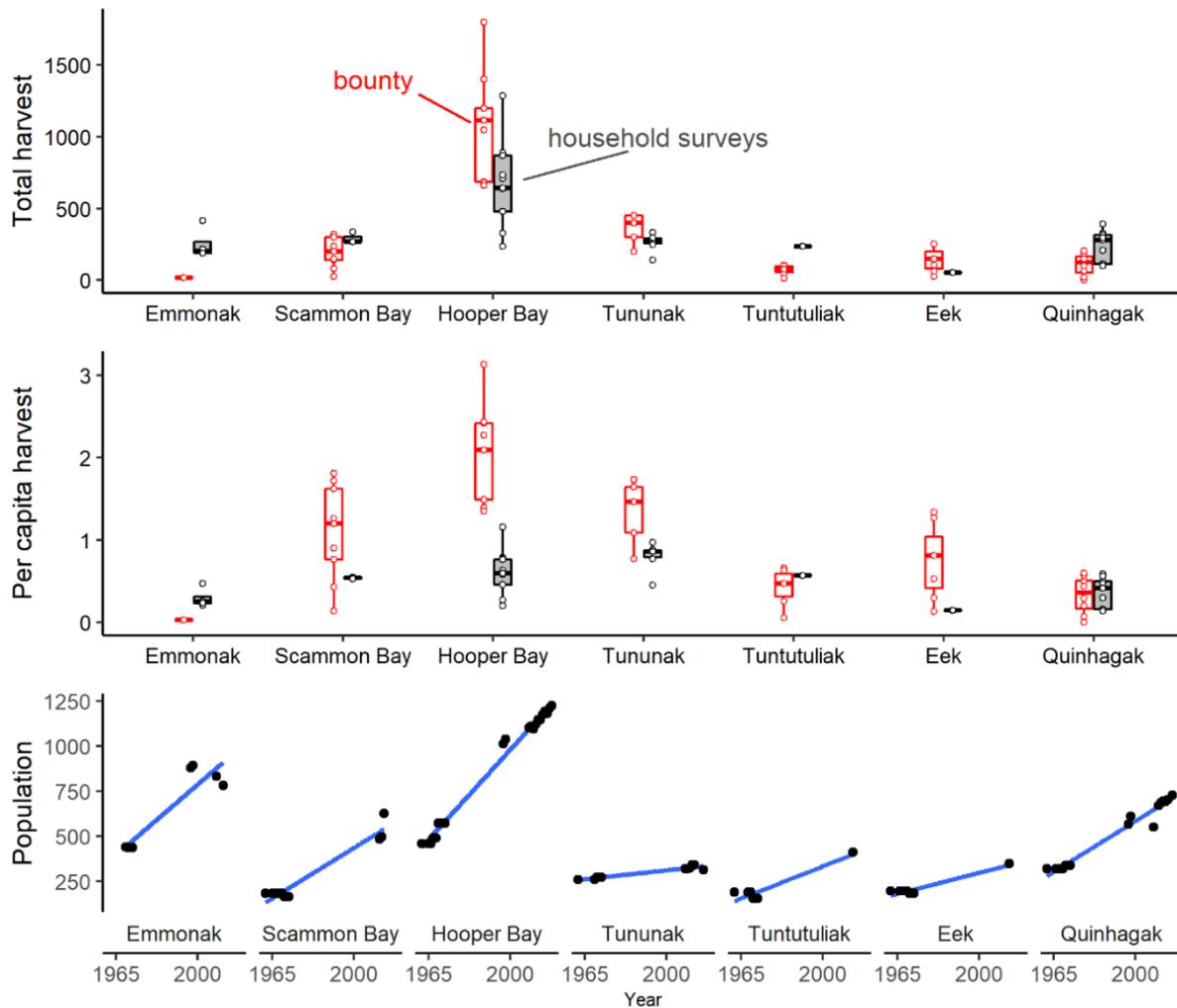


Figure 4. Ranges of annual total and per capita ice seal (ringed, bearded, spotted, and ribbon combined) harvests for seven Yukon-Kuskokwim Delta communities. Periods compared are the 1962–1972 bounty period (red) and 1997–2018 when household surveys were intermittently conducted (gray). Struck and lost seals are not included. Human population trend by community for both periods are presented as blue trendlines.

Figure 5

Figure 5 shows:

- From 2008–2018, harvests declined for Hooper Bay, Tununak and Quinhagak.
- Declines occurred for the harvest of ringed, bearded, and spotted seals.

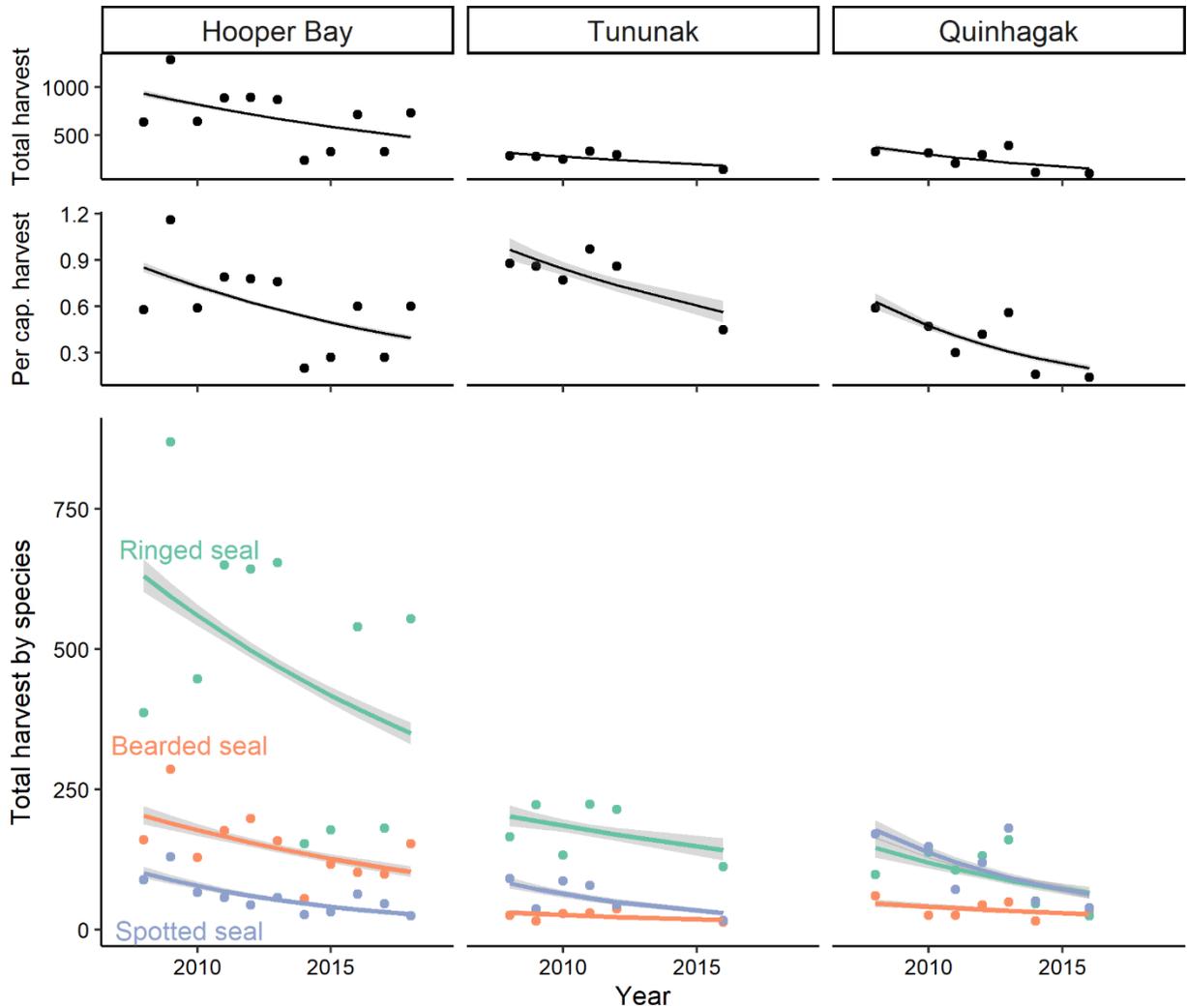


Figure 5. Total harvests, per capita harvests, and proportions of ringed, bearded, and spotted seals in the harvests each year 2008–2018 for Hooper Bay, Tununak, and Quinhagak. Solid lines are fitted trend lines over time, and grey bands represent standard error around each fit. All trends are statistically significant ($p < 0.05$).

Figure 6

Figure 6 shows:

- The number of households that reported actively hunting or using seal products at Hooper Bay, Tununak, and Quinhagak declined from 2008–2018.
- More households reported using seal products than hunting seals, indicating that sharing is occurring.

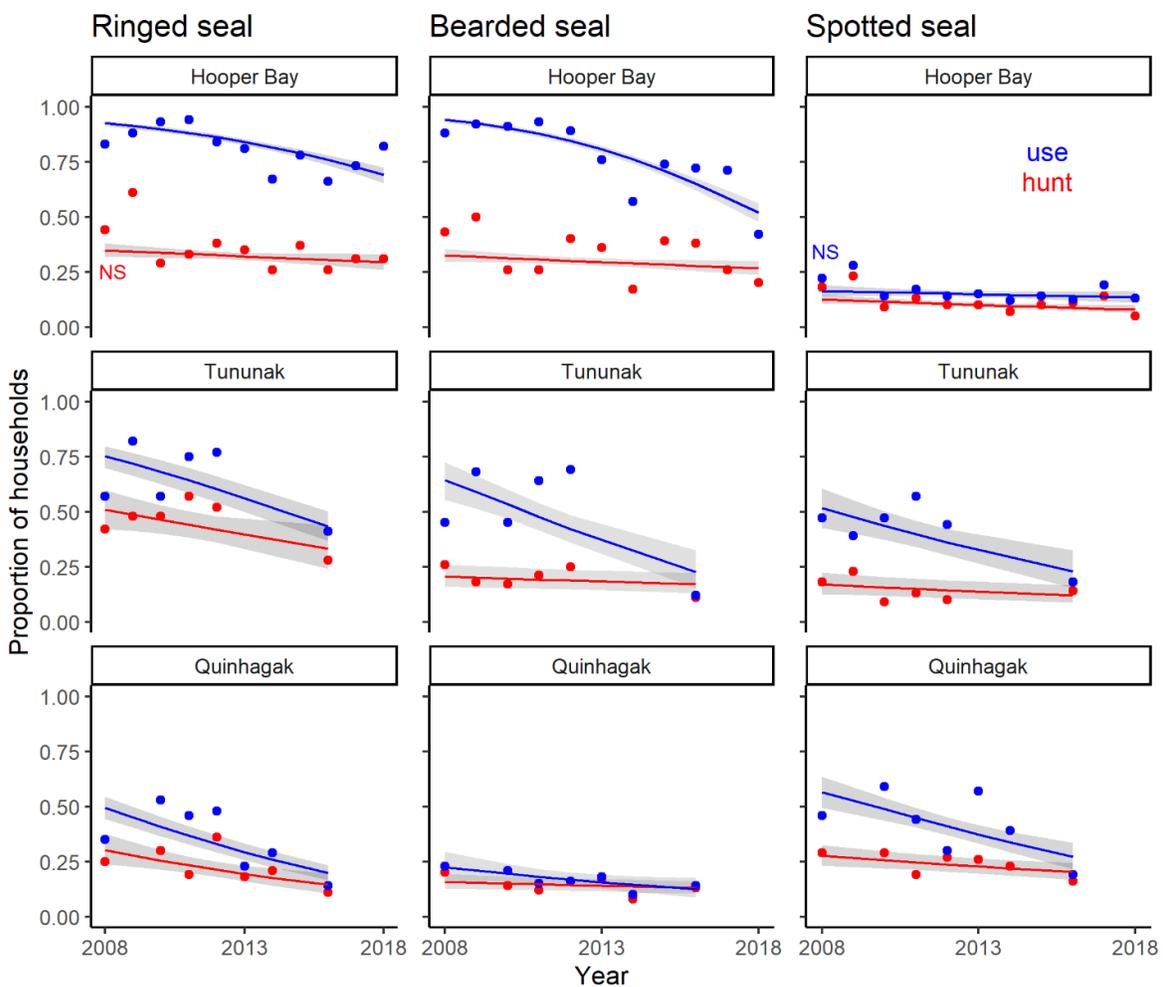


Figure 6. Proportion of households that reported using (blue) or hunting (red) each seal species each year based on household surveys at Hooper Bay, Tununak, and Quinhagak. Solid lines are fitted trend lines over time, and grey bands represent standard error around each fit. All trends are statistically significant ($p < 0.05$) except for households that hunt ringed seals and use spotted seals in Hooper Bay where ‘NS’ denotes trends are not significant.