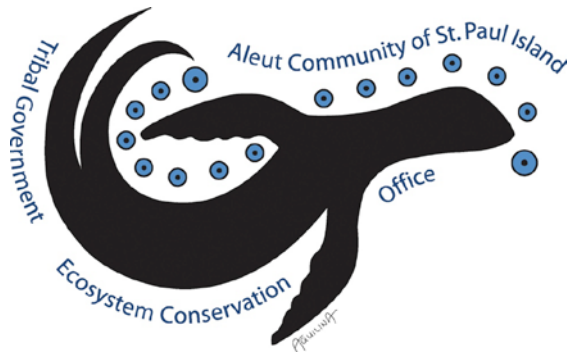


Subsistence harvest of juvenile laaquadan (northern fur seals, *Callorhinus ursinus*) on St. Paul Island, Alaska in 2019

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by

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INTRODUCTION

Laaquadan or northern fur seals (*Callorhinus ursinus*) are a vital cultural and subsistence resource for Unangan (the Aleut people) of St. Paul Island, Alaska. As the primary customary and traditional users of laaquadan in the region of St. Paul, the Aleut Community of St. Paul Island Tribal Government (ACSPI) is committed to the long-term sustainable use of laaquadan for cultural continuity, food, clothing, arts, and crafts. The subsistence harvest of laaquadan on the Pribilof Islands (St. Paul and St. George Islands) is governed by regulations established under the Fur Seal Act and Marine Mammal Protection Act (MMPA) and was modified by the National Marine Fisheries Service (NMFS) in 2019. NMFS entered into a co-management agreement with the ACSPI, a federally recognized tribe of Alaskan Natives, in 2000 (amended in January 2020) under Section 119 of the MMPA to provide for the conservation and co-management of laaquadan, qawan or Steller sea lions (*Eumetopias jubatus*), and isuġin or harbor seals (*Phoca vitulina*).

NMFS modified the subsistence use regulations for laaquadan on St. Paul Island based on a petition from the ACSPI (77 FR 41168; submitted July 12, 2012). The final rule was published in the Federal Register and became effective on September 27, 2019. The rule authorizes Pribilovians who reside on St. Paul Island to take for subsistence uses each year up to 2,000 male laaquadan less than 7 years old and including pups (defined as ‘juvenile’), during two seasons. The rule defines the first season from January 1 through May 31 and authorizes the use of firearms to take juvenile laaquadan during this season. The second season is defined as June 23 through December 31 and authorizes the harvest of juvenile laaquadan without the use of firearms. The rule authorizes up to 20 incidental mortalities of female laaquadan per year (of the 2,000 laaquadan authorized for subsistence use per year). Finally, the rule delegates more management and enforcement responsibility of the subsistence use of laaquadan to the locally-based St. Paul Island Co-Management Council (hereafter referred to as ‘the Council’). The Council is a body established via the original co-management agreement between the ACSPI and NMFS (signed in 2000) to oversee subsistence uses of marine mammals on St. Paul Island, and is comprised of ACSPI and NMFS representatives.

NMFS and ACSPI revised and aligned the co-management agreement and developed the *Co-management Plan for Subsistence Use of Marine Mammals on St. Paul Island, Alaska* (approved by the Council in April 2020) for consistency with the final rule. Specifically, the Council will use the adaptive management framework as detailed by the co-management plan to make in-season decisions regarding marine mammal subsistence uses of laaquadan, qawan, and isuġin on St. Paul Island that are consistent with federal laws and regulations, the approved co-management agreement, and Tribal ordinances. Adaptive management activities are described in the co-management plan and include monitoring and research to collect data on subsistence user behavior, effectiveness, level of take, and other information to support the Council’s decision-making processes and inform the public.

Since 2001, the ACSPI has monitored and reported on the subsistence harvest of laaquadan for our community and NMFS. Subsistence harvest reports are published annually and can be found online at <https://www.fisheries.noaa.gov/resource/document/subsistence-harvest-sub-adult-northern-fur-seals-st-paul-island-alaska> (see Lestenkof and Zavadil, 2001-2002, 2006-2007; Zavadil and Lestenkof, 2003; Malavansky et al., 2005; Lestenkof et al., 2006; Zavadil, 2008 and 2010; Zavadil et al., 2011; Lestenkof et al., 2011-2012, 2014-2015, and 2019; Melovidov et al.,

2014 and 2017). In this report, the ACSPI describes subsistence uses of juvenile male laaquadan, including pups on St. Paul Island during the harvest season from June 23 to December 31, 2019.

METHODS

Harvest method

The method of conducting the subsistence harvest of laaquadan was developed during the commercial harvest period (late 1700s to 1984) and is referenced in federal regulations as the established harvest method of herding and stunning followed immediately by exsanguination. Algaġin (harvests) are conducted by a designated crew of at least four (for male pup harvests) and up to eight people (for male juvenile harvests). The ACSPI accepts requests for laaquadax¹ from the community before each scheduled harvest. Subsistence harvest locations are selected by the harvest foreman based on the number of laaquadan requested. ACSPI staff, through the Ecosystem Conservation Office (ECO), coordinate subsistence takes with the harvest foreman, harvest crew, and subsistence users to fulfill the community's identified subsistence needs. A harvest foreman is designated annually prior to the start of the harvest season. The foreman is responsible for supervising all aspects of subsistence harvests and working with ECO to ensure that management measures in the co-management plan are followed. The harvest crew are individuals that round up (udugunu-lix²), watch (chasavya-lix), pod cut, stun (anaġi-lix), and stick or stab the heart (chuhni-lix) of the laaquadan.

At a specific laaquadan haulout (resting area), three to six people (udugunusnikan or people rounding up laaquadan) walk into the haulout to round up laaquadan in a manner that prevents animals from escaping into the water. Once surrounded, udugunusnikan slowly herd the laaquadan inland to a harvest area where they are held in a large group, or pod, by at least three chasavyasnikan (watchers). At this time, animals are observed for entanglements, flipper tags, females, and other identifiable issues that can be addressed during harvest. Five to ten juvenile laaquadan at a time are separated from the pod and guided a short distance towards a group of three to four anaġisnikan (clubbers) equipped with wooden clubs. Anaġisnikan stun the laaquadan by hitting them on the skull or upper neck with a solid wooden club and chuhnisnikan (people who stab or pierce the heart) immediately approach and exsanguinate the laaquadax after it is clubbed allowing a humane death. The harvest method for laaquadadaan (pups) includes handling, sexing, and verifying sex of all laaquadadaan prior to harvest. Male laaquadadaan are positively identified by trained and approved individuals prior to stunning with a wood baseball bat; female laaquadadaan are released. Stunned laaquadadaan are then brought a short distance away from the stunning area where they are exsanguinated by chuhnisnikan, allowing a humane death. The laaquadan or laaquadadaan are then skinned by sayusnikan (people who remove the pelt) and butchered for human consumption. For a more detailed description of the commercial harvest procedure for laaquadan, see previous humane observer reports: Stoskopf, 1984; Letcher, 1985; Dorsey, 1986; Zimmerman and Letcher, 1986; and Spraker, 1987-2010.

Harvest monitoring

ECO monitored and performed the humane observer functions for the subsistence laaquadan harvest for the ACSPI. ECO staff collected subsistence monitoring data to ensure the taking of

¹ Singular form of laaquadan.

² Suffix -lix changes the word to a verb.

laaquadan was accomplished in a humane and non-wasteful manner and consistent with the co-management plan. Monitoring data included: harvest date and time, harvest location, weather conditions, total number of laaquadan harvested, sex and age class of laaquadan harvested, female laaquadan mortality, other mortality, disposition of laaquadan parts, number of non-harvested laaquadan released, research samples collected from laaquadan, tagged and entangled laaquadan, and harvest observation permits for non-tribal members viewing the harvest. Subsistence monitoring for laaquadan included monitoring during laaquadan³ harvests by ECO and NMFS.

Research

ECO staff collected the following measurements and tissue samples in the field from non-pups harvested from June 23 to July 31, 2019: body length, blubber thickness, canine teeth, vibrissae, blubber, liver, blood, muscle, bile, and fur. Biosampling information was recorded on biosample forms and entered into the BeringWatch database and reviewed for accuracy following quality control protocols.

ECO staff measured the body lengths of at least 50% of harvested laaquadan using a metal caliper placed over the animals, measuring from the tip of the nose to the tip of the tail to the nearest centimeter. Blubber thickness was measured to the nearest millimeter where the chest was cut open using a small ruler. Body length and blubber thickness measurements were recorded in a field notebook with an associated unique sample number (one number per laaquadan and increasing sequentially through the season), the harvest date and the location. A zip lock bag labelled with the unique sample number was inserted into each measured animal's mouth after exsanguination and measurements were collected. Once the laaquadan was butchered, the head with a zip lock bag in the mouth was collected and the snout (with upper canine teeth and vibrissae) removed. Snouts were inserted into the labelled zip lock bags and stored frozen prior to boiling and extracting the upper canine teeth. At least two vibrissae were removed from each snout, stored in whirl-pak bags and archived at ECO for future stable isotope analysis. ECO staff boiled laaquadan jaws in batches in a steam kettle following the *Steam Kettle* protocol to extract the upper and/or lower canine teeth. ECO staff visually inspected the external surfaces of canines for growth rings to estimate the age of individual animals following methods in Scheffer (1950) and archived them at ECO for future analysis of length-at-age.

ECO staff collected 300-350 g samples of blubber and liver from at least one harvested animal per harvest for future retrospective research on contaminant levels and animal health. Samples were processed immediately after each harvest following the *Tissue Sampling Protocol for the National Marine Mammal Tissue Bank* (Becker et al. 1999) and shipped to Hollings Marine Laboratory in Charleston, S.C. for long term banking in the National Marine Mammal Tissue Bank through the Alaska Marine Mammal Tissue Archival Project.

ECO staff collected blood, fur, and muscle samples for Dr. Lorrie Rea from the University of Alaska Fairbanks (UAF) to assess mercury concentrations in juvenile male laaquadan. Samples were processed immediately after each harvest in the NOAA lab following the *Northern Fur Seal Blood, Fur, Muscle and Vibrissae Collections for L. Rea* protocol updated on June 27, 2019.

ECO staff collected blood and blubber for Dr. Aaron Roberts from the University of North Texas (UNT) to assess contaminant (PBDEs) concentrations. Samples were processed and stored immediately after each harvest in the NOAA lab following the *Northern Fur Seal Blood, Serum*

³ Singular form of laaquadan.

and Blubber Collections for B. Soulen protocol.

ECO staff collected and pooled bile samples after butchering from discarded gall bladders. Samples were archived at ECO in a -80°C freezer for future contaminants analysis.

ECO staff collected pelt samples for Dr. David Johnston from Duke University Marine Lab (DUML) to aid in the development of new adhesion technologies for fixation of tags and biologgers. Samples were collected and stored immediately after each harvest following the *Fur Sampling for Duke's Fur-Gluing Study* protocol.

RESULTS

The ACSPI co-managed and monitored subsistence harvests consistent with the current federal regulations, cooperative responsibilities of the co-management agreement with NMFS, the currently approved working draft of the co-management plan, and Tribal ordinances. Harvests for juvenile males 2 years and older were scheduled on a weekly basis between June 23 and July 31, 2019 and were not affected by the regulatory change on September 27, 2019. Harvests for laaquadan males were scheduled on a daily basis between September 30 and October 5, 2019, and on an as needed basis until December 31, 2019. The subsistence harvest season of laaquadan consisted of 12 harvest events during this time frame.

Harvest drive and rest durations

To avoid mortality from hyperthermia (overheating), laaquadan were driven slowly towards the designated harvest location and given adequate rest following herding from the haulout. The rest duration was determined based on the behavioral signs of the laaquadan held in the group; once laaquadan do not exhibit early signs of hyperthermia (e.g., flipper fanning, open mouth breathing, and lying down), subsequent harvest activities commenced. Juvenile laaquadan were gathered between 08:44 and 09:18 during all seven harvest events from June 23 to July 31 (Appendix 1). Drive durations ranged from 6 to 18 minutes with an average duration of 12 minutes (Appendix 1). Rest durations after herding ranged from 6 to 25 minutes with an average duration of 10 minutes (Appendix 1). Laaquadan (pups) were gathered between 13:50 and 14:42 during three harvest events from September 30 to October 5 (Appendix 1). Drive durations ranged from 4 to 16 minutes with an average duration of 11 minutes (Appendix 1). Rest durations after herding ranged from 0 to 4 minutes with an average duration of 2 minutes (Appendix 1). Drive and rest times were not collected for two of the five harvest events (Appendix 1). Laaquadan did not exhibit early signs of hyperthermia (e.g., flipper fanning, open mouth breathing, and lying down) during this year's harvest season.

Weather conditions

The following weather conditions were measured prior to each harvest (before laaquadan were herded): air temperature, wind speed, wind direction, and current conditions. Degree of wetness of the grass at each harvest area (at each killing field) was also estimated and recorded; wet grass is believed to be an important cooling factor for laaquadan. Air temperature from June 28 to July 31 ranged from 48°F to 52°F with an average of 50° F (Appendix 1). Wind speed ranged from 1-3 mph to 13-18 mph with an average of 7-10 mph (Appendix 1). The grass was either damp or wet during each of the seven harvest events (Appendix 1). Air temperature from September 30 to October 5 ranged from 49°F to 50°F with an average of 49° F. Wind speed ranged from 4-7 mph to 13-18 mph with an average of 10-14 mph. The grass was damp during three harvest events

and dry during one harvest event (Appendix 1). Degree of grass wetness was not collected for one of the five harvest events (Appendix 1).

Timing, frequency, and location of subsistence harvests

Juvenile males 2 years and older were harvested from June 28 to July 31 during seven harvest events and from four haulout areas (Table 1; Appendix 1). Male laaquadaan were harvested from September 30 to October 5 during five harvest events and from five haulout areas (Table 1; Appendix 1). No haulout was harvested more than once per week during the 2019 harvest season (Table 1; Appendix 1).

Total number, sex, and age class of laaquadan harvested

A total of 296 laaquadan were harvested during the 2019 harvest season (Table 1). ECO staff externally examined all harvested animals to verify sex. Of the total harvested, 182 were juvenile males, 2 were juvenile females, 111 were male laaquadaan, and 1 was a female laaquadaaâ (Table 1; Appendix 1).

Female laaquadaaâ mortality

A total of 3 female laaquadan (2 juveniles and 1 laaquadaaâ) were accidentally killed during the harvest season (Table 1; Appendix 1). The interim female laaquadaaâ mortality threshold levels in the co-management plan were not reached nor exceeded during the harvest season.

Table 1: Date, location, and number of male and female juvenile laaquadan, including laaquadaan, harvested during the subsistence harvest season on St. Paul Island, Alaska in 2019.

Date	Location	Number Males	Number Females
28 June	Morjovi	19	0
3 July	Polovina	7	0
10 July	Big Zapadni	16	0
19 July	Polovina	41	0
26 July	Big Zapadni	30	0
29 July	Zapadni Reef	15	1
31 July	Polovina	54	1
30 September	Zoltoi Sands	18	1
1 October	Little Zapadni	15	0
2 October	Morjovi	30	0
3 October	Polovina	44	0
5 October	Reef	4	0
Total		293	3

Other mortality

No other mortality occurred during this year's harvest season (Appendix 1). Harvests were not accomplished in a wasteful manner under §216.71(b).

Disposition of laaquadan parts

Some laaquadan pelts, esophagus, ears, whiskers, and teeth were taken for the creation of arts and crafts during this year's harvest season.

Effects on non-targeted laaquadan

ECO collected data on the number of laaquadan harvested and released to characterize effects on non-targeted laaquadan. The average number of juvenile laaquadan herded during each harvest event from June 23 to July 31 was 149 juveniles. Of those herded, an average of 26 (18%) juveniles were harvested and an average of 123 (82%) juveniles were released (Appendix 1). The average number of laaquadan herded during each harvest event from September 30 to October 5 was 41 laaquadan. Of those herded, an average of 22 (55%) laaquadan were harvested and an average of 18 (45%) laaquadan were released (Appendix 1).

Research

Body length measurements, blubber thickness measurements, canine teeth, and vibrissae were collected from approximately 50% of harvested laaquadan from June 28 to July 31. Body length measurements were collected from 92 laaquadan, blubber thickness measurements were collected from 90 laaquadan, and canine teeth and vibrissae were collected from 90 laaquadan during this year's harvest season. Canine teeth were archived at ECO until a method to confirm results is identified and implemented. A subsample of teeth may be shipped to Matson's Laboratory, LLC in Manhattan, Montana, for cementum age analysis for validation. Vibrissae were archived at ECO for future stable isotope analysis.

Body length measurement statistics were as follows: the minimum length was 94.5 cm, the maximum length was 123.5 cm, and the average length was 106.9 cm which was slightly less than the average body length of 107.8 cm from 2012-2018. Blubber thickness measurement statistics were as follows: the minimum thickness was 7.0 mm, the maximum thickness was 44.0 mm, and the average thickness was 24.5 mm. Age estimation statistics were as follows: the minimum age was 3 years old, the maximum age was 6 years old, and the average age was 4 years old.

Blubber and liver samples were collected from 7 harvested laaquadan and shipped to Hollings Marine Laboratory in Charleston, S.C. for long term storage (Appendix 1). Whole blood, serum, muscle, and fur were collected from 16 harvested laaquadan and shipped to UAF for analysis (Appendix 1). Whole blood, serum, and blubber were collected from 16 harvested laaquadan and shipped to UNT for analysis (Appendix 1). Bile samples were collected from discarded gall bladders and pooled in five 15ml centrifuge vials wrapped in aluminum foil and archived at ECO for future contaminants analysis. Fur samples were collected from 20 harvested laaquadan and shipped to DUMML.

Tagged and entangled laaquadan

No flipper-tagged laaquadan were observed during the harvest season (Appendix 1). Two entangled male laaquadan were observed during the harvest season. The animals were captured, disentangled, and released (Appendix 1). Level A forms were submitted to the NMFS Alaska Regional Stranding Coordinator and Technical Monitor for both disentanglements.

Harvest observation permits

The ACSPI has a tribal ordinance that requires non-tribal members, except those who are legally

married to a tribal member, to obtain a permit to observe the laaquadan harvest. A total of 27 observation permits were issued to non-tribal members this harvest season.

DISCUSSION

Harvests for juvenile males 2 years and older were scheduled to concentrate harvest effort between June 23 and July 31 to minimize accidental taking of females that tends to occur in August (ECO, unpub. data). The ACSPI has determined that the best means to reduce accidental taking of females is to suspend harvests for juveniles 2 years and older on July 31, rather than continue to attempt to harvest until August 8 as was allowed by the previous regulations.

Ideally, joint harvests for laaquadaan and yearlings would have been scheduled to concentrate harvest effort between August 1 and November 30; however, the final rule wasn't published until late September. No yearlings were taken this year. ACSPI and NMFS decided to focus efforts on implementing the harvest method for laaquadaan and training individuals (subsistence users) in handling, sexing, and verifying sex of all laaquadaan prior to harvest to avoid accidentally taking any more females during the remainder of the season. NMFS monitored the laaquadaan harvest on October 5. ECO staff were not present to record the weather conditions and drive and rest times. In the future NMFS and ECO will develop a monitoring schedule to ensure efficient coordination of data collection.

CONCLUSION

A total of total of 296 laaquadan were harvested during 12 harvest events within the 2019 harvest season. Juvenile males 2 years and older were harvested during 7 harvest events from June 28 to July 31, with 182 males and 2 females harvested. Laaquadaan were harvested during 5 harvest events from September 30 to October 5, with 111 males and 1 female harvested. Harvests for juvenile males 2 years and older were concluded on July 31. Harvests for laaquadaan were scheduled on a daily basis from September 30 to October 5 as soon as the regulations were approved and finalized. No harvests were conducted after October 5. Zero cases of mortality due to hyperthermia occurred, no inhumane acts were observed during harvests, and harvests were not accomplished in a wasteful manner.

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REFERENCES

- Becker P.R., B.J. Porter, E.A. Mackey, M.M. Schantz, R. Demiralp, and S.A. Wise. 1999. National Marine Mammal Tissue Bank and Quality Assurance Program: Protocols, inventory, and analytical Results. U.S. Department of Commerce, National Institute of Standards and Technology, NISTIR 6279. Gaithersburg, MD. 183 p.
- Dorsey, A.S. 1986. Humane Observer Report, Pribilof Island Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Lestenkof, A.D. and P.A. Zavadil. 2001. 2001 Subsistence Fur Seal Harvest Season Report. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, A.D. and P.A. Zavadil. 2002. The Subsistence Harvest of Northern Fur Seals on St. Paul Island in 2002, Final Report. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, A.D., P.A. Zavadil, A. Malavansky, and M. Malavansky, Jr. 2006. The Subsistence Harvest of Northern Fur Seals on the Pribilof Islands in 2005. St. George and St. Paul Islands, Pribilof Islands, Alaska.
- Lestenkof, A.D. and P.A. Zavadil. 2006. 2006 Subsistence Fur Seal Harvest on St. Paul Island Memorandum for the Record. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, A.D. and P.A. Zavadil. 2007. 2007 Subsistence Fur Seal Harvest on St. Paul Island Memorandum for the Record. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, P.M., P.I. Melovidov, D.V. Roberts, and P.A. Zavadil. 2011. The Subsistence Harvest of Sub-adult Northern Fur Seals on St. Paul Island, Alaska in 2011. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, P.M., P.I. Melovidov, M. Rukovichnikoff, Sr., and P.A. Zavadil. 2012. The Subsistence Harvest of Subadult Northern Fur Seals on St. Paul Island, Alaska in 2012. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, P.M., P.I. Melovidov, and M. Rukovichnikoff, Sr. 2014. The Subsistence Harvest of Subadult Northern Fur Seals on St. Paul Island, Alaska in 2013. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, P.M., P.I. Melovidov, and A.P. Lestenkof. 2015. The Subsistence Harvest of Subadult Northern Fur Seals on St. Paul Island, Alaska in 2015. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Lestenkof, P.M., L.M. Divine, P.I. Melovidov, A.P. Lestenkof, V.M. Padula and K.M. Melovidov. 2019. The Subsistence Harvest of Sub-Adult Iaaqudan (Northern Fur Seals) on St. Paul Island, Alaska in 2018. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska. 16 pp.
- Letcher, J.D. 1985. Humane Observer Report, Pribilof Fur Seal Harvest, National Marine Fisheries Service, Juneau, Alaska.
- Malavansky, A., M. Malavansky, Jr., P.A. Zavadil, A.D. Lestenkof, and P.G. Tetoff. 2005. The Subsistence Harvest of Northern Fur Seals on the Pribilof Islands in 2004. St. George and St. Paul Islands, Pribilof Islands, Alaska.

- Melovidov, P.I., P.M. Lestenkof, M. Rukovishnikoff, Sr., and D.V.V. Roberts. 2014. The Subsistence Harvest of Subadult Northern Fur Seals on St. Paul Island, Alaska in 2014. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Melovidov, P.I., P.M. Lestenkof, A.P. Lestenkof, L.M. Divine, and R.M. Rukovishnikoff. 2017. The Subsistence Harvest of Sub-Adult Northern Fur Seals on St. Paul Island, Alaska in 2016. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Melovidov, P.I., P.M. Lestenkof, A.P. Lestenkof, L.M. Divine, V.M. Padula and R. Mata Rukovishnikoff. 2017. The Subsistence Harvest of Sub-Adult Northern Fur Seals on St. Paul Island, Alaska in 2017. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska. 13 pp.
- NMFS and ACSPI (2000). Co-Management Agreement Between the Aleut Community of St. Paul Island and the National Marine Fisheries Service. Aleut Community of St. Paul Island and the National Marine Fisheries Service. June 13, 2000. 12 pp.
- NMFS and ACSPI (2020). Co-Management Agreement Between the Aleut Community of St. Paul Island and the National Marine Fisheries Service. Aleut Community of St. Paul Island and the National Marine Fisheries Service. January 27, 2020. 11 pp.
- Spraker, T.R. 1987. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1988. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1989. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1990. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1991. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1992. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1993. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1994. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1995. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1996. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Services, Juneau, Alaska.
- Spraker, T.R. 1997. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 1998. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Services, Juneau, Alaska.
- Spraker, T.R. 1999. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2000. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Services, Juneau, Alaska.

- Spraker, T.R. 2001. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2002. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2003. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2004. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2005. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2006. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2007. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2008. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2009. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Spraker, T.R. 2010. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Stoskopf, M.K. 1984. Humane Observer Report, Pribilof Fur Seal Harvest. National Marine Fisheries Service, Juneau, Alaska.
- Zavadil, P.A. and A.D. Lestenkof. 2003. The Subsistence Harvest of Northern Fur Seals on St. Paul Island in 2003. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Zavadil, P.A. 2008. 2008 Subsistence Fur Seal Harvest on St. Paul Island Memorandum for the Record. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Zavadil, P.A. 2010. 2009 Subsistence Fur Seal Harvest on St. Paul Island Memorandum for the Record. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Zavadil, P.A., P.M. Lestenkof, S.M. Zacharof, and P.I. Melovidov. 2011. The Subsistence Harvest of Sub-Adult Northern Fur Seals on St. Paul Island, Alaska in 2010. Aleut Community of St. Paul Island, Tribal Government, Ecosystem Conservation Office. St. Paul Island, Pribilof Islands, Alaska.
- Zimmerman, S.T. and J.D. Letcher, 1986. The 1985 Subsistence Harvest of Northern Fur Seals, *Callorhinus ursinus*, in St. Paul Island, Alaska. National Marine Fisheries Service, Juneau, Alaska.