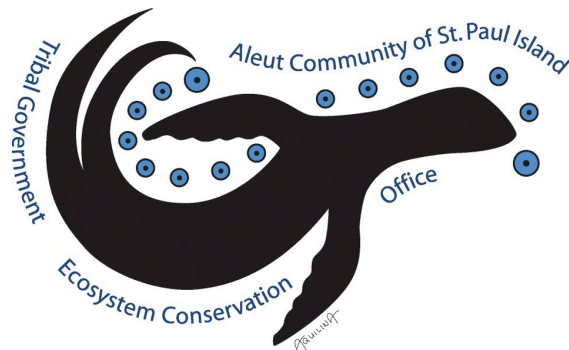


Subsistence harvest of juvenile laaquadan (northern fur seals, *Callorhinus ursinus*) on St. Paul Island, Alaska in 2021

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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 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 isug̃in 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 use 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 for consistency with the final rule. The Council developed the *Co-management Plan for Subsistence Use of Marine Mammals on St. Paul Island, Alaska* (reviewed and approved by the Council in December 2020 <https://media.fisheries.noaa.gov/2021-01/Co-Management-Plan-Subsistence-St-Paul-122220.pdf?null>) to implement the new agreement and regulations. Specifically, the Council relies on an adaptive management framework from the co-management plan to collect information to support in-season decisions regarding marine mammal subsistence uses of laaquadan, qawan, and isug̃in 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> (Lestenkof et al., 2019). In this report, the ACSPI describes subsistence take of juvenile male laaquadan, including pups on St. Paul Island during

the harvest season from June 23 to December 31, 2021.

METHODS

Harvest Methods

Community-Style Harvest Methods

The method of conducting the subsistence harvest of laaquadan was developed during the commercial harvest period (1870 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 laaquada¹ 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 the club and chuhnisnikan (people who stab or pierce the heart) immediately approach and exsanguinate the laaquada¹ after it is clubbed ensuring a humane death. The harvest method for laaquadaadan (pups) includes handling, sexing, and verifying sex of all laaquadaadan prior to harvest. Crew can safely handle large numbers of laaquadaadan, unlike laaquadan during June and July. Male laaquadaadan are positively identified by knowledgeable community members prior to stunning with a wood baseball bat; female laaquadaadan are released. Stunned laaquadaadan are then brought a short distance away from the stunning area where they are exsanguinated by chuhnisnikan, ensuring a humane death. The laaquadan or laaquadaadan are then skinned by sayusnikan (people who remove the pelt) and butchered for human consumption.

Family-Style Harvest Methods

Family-style harvests consist of a fewer number of harvesters, such as a family group or group of families, that harvest laaquadaadan and yearlings independently of an organized community harvest. Family style harvests of laaquadaadan are preformed independently of the organized

¹ Singular form of laaquadan.

² Suffix -lix changes the word to a verb.

harvests. The co-management plan provided this alternate approach to better serve community needs by providing the opportunity for community members to obtain subsistence resources on weekends or evenings with fewer participants, fewer laaquadan taken per harvest, and a higher frequency of occurrence.

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 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.

Scientific Research

ECO staff collected canine teeth, vibrissae, blubber and liver in the field from a random sample of non-pups harvested from July 2 to July 30, 2021. Biosampling information was recorded on biosample forms and entered into the BeringWatch database and reviewed for accuracy following quality control protocols. These samples are collected as practical during the skinning and butchering process.

Once a 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. Once the canines are removed and dried, ECO staff visually inspected the external surfaces of canines for growth rings to estimate the age of harvested laaquadan following methods in Scheffer (1950). The estimated age data are subsequently shared with NMFS and the canines are archived at ECO for future analysis.

ECO staff collected 300-350 g samples of blubber and liver from at least one harvested animal per harvest event 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.

Hunting Methods

Hunting occurred from January 1 to May 31, 2021. Hunters use firearms and all hunters are on land when they shoot laaquadan (i.e., no hunting from vessels occurs).

³ Singular form of laaquadan.

Hunting Monitoring

The real-time subsistence monitoring method established by the ECO under its Tanam Amgignaa (Island Sentinel) Program allows for the collection of local subsistence data within a 48-hour period via voluntary hunter reporting and reporting requirements outlined in the Co-Management Agreement (<https://www.fisheries.noaa.gov/resource/document/co-management-agreement-between-aleut-community-st-paul-island-and-national>). ECO collects subsistence data directly from hunters in a standardized format and enters quality-controlled data into our BeringWatch database. Subsistence data are obtained at a high rate through active monitoring by ECO Island Sentinels and one-on-one communication with hunters. Over the years, ECO Island Sentinels have developed an effective and positive working relationship with subsistence hunters and continue to improve communication with hunters through active and consistent interactions.

Scientific Research

In addition to subsistence monitoring data, ECO Island Sentinels collect biological samples from retrieved laaquadan immediately following the butchering process whenever possible. Island Sentinels collect a standard suite of samples consisting of the snout or upper jawbone (upper right canine and upper right 2nd premolar tooth) and 3-4 vibrissae or whiskers. Teeth are used to age the retrieved laaquadan and whiskers are archived in ECO for stable isotope analysis of diets pending future funding. In 2021, Island Sentinels collected snouts from 3 subsistence hunted laaquadan (50% of total retrieved animals) and whiskers from 3 subsistence hunted laaquadan (50% of total retrieved animals). All canines and premolars have been processed via the Steam Kettle protocol and sent to Matson's Laboratory for analysis. ECO will provide these data to NMFS when available.

RESULTS

Harvest 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 version 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, 2021. Harvests for laaquadadaŋ males were scheduled on a daily/weekly basis between August 27 and December 30, 2021, and on an as needed basis until December 31, 2021. The subsistence harvest season of laaquadan consisted of 14 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 08:52 and 09:29 am during all seven harvest events from July 2 to July 30 (Appendix 1). Drive durations ranged from 8 to 22 minutes with an average duration of 12 minutes (Appendix 1). Rest durations after herding ranged from 3 to 18 minutes with an average duration of 12 minutes (Appendix 1). Data collected during the 2021 laaquadadan (pups) season is limited

to date, location, sex and numbers harvested due to family style harvesting.

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 2 to July 30 ranged from 46°F to 48°F with an average of 48° F (Appendix 1). Wind speed ranged from 4-7 mph to 19-24 mph with an average of 9-13 mph (Appendix 1). The grass was wet 4 days out of the seven harvest events (Appendix 1). Data collected during the 2021 laaquadaadan (pups) season is limited to date, location, sex and numbers harvested due to family style harvesting.

Timing, frequency, and location of subsistence harvests

Juvenile males 2 years and older were harvested from July 2 to July 30 during seven harvest events and from four haulout areas (Table 1; Appendix 1). Male laaquadaadan were harvested from August 27 to December 30 during fourteen harvest events and from three haulout areas (Table 1; Appendix 1). No haulout was harvested more than once per week during the 2021 harvest season (Table 1; Appendix 1).

Total number, sex, and age class of laaquadan harvested

A total of 162 laaquadan were harvested during the 2021 harvest season (Table 1). ECO staff externally examined all harvested animals to verify sex. Of the total harvested, 131 were subadult males, 27 were male laaquadaadan, 3 were male yearlings and 1 was a female adult. (Table 1; Appendix 1).

Female laaquadaâ mortality

There was one female laaquadan accidentally killed during the harvest season (Table 1; Appendix 1). The interim female laaquadaâ 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 laaquadaadan, harvested during the subsistence harvest season on St. Paul Island, Alaska in 2021.

Date	Location	Number Subadult Males	Number Yearling Males	Number Pup Males	Number Females
<i>Community-style Harvests</i>					
2 July	Polovina	17	0	0	0
9 July	Big Zapadni	15	0	0	0
16 July	Polovina	17	0	0	0
22 July	Little Zapadni	14	0	0	0
23 July	Lukanin/Kitovi	10	0	0	0
29 July	Polovina	22	0	0	0
30 July	Big Zapadni	36	0	0	1
<i>Family-style Harvests</i>					
27 August	Polovina Rookery Sec.1	0	0	7	0
1 September	NEPT Sea Lion Neck	0	0	1	0
3 September	NEPT Sea Lion Neck	0	0	1	0
5 September	Polovina Rookery Sec.1	0	0	1	0
5 September	Little Zapadni Blind	0	0	2	0
11 September	NEPT Sea Lion Neck	0	0	1	0
14 September	Polovina Rookery Sec.1	0	0	6	0
16 September	NEPT Sea Lion Neck	0	0	2	0
18 September	NEPT Sea Lion Neck	0	1	0	0
8 October	NEPT Sea Lion Neck	0	0	1	0
12 October	Little Zapadni Blind	0	0	2	0
13 October	NEPT Sea Lion Neck	0	1	2	0
28 October	Little Zapadni Blind	0	0	1	0
30 December	NEPT Sea Lion Neck	0	1	0	0
Total		131	3	27	1

Other mortality

No other mortality occurred during this year's harvest season (Appendix 1). Harvests were not accomplished in a wasteful manner in accordance to FR§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 the 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 July 2 to July 30 was 144 juveniles. Of those herded, an average of 19 (13%) juveniles were harvested and an average of 126 (87%) juveniles were released (Appendix 1). Data collected during the 2021 laaquadan (pups) season is limited to date, location, sex and numbers harvested due to family style harvesting. Research canine teeth and vibrissae were collected from approximately 41% of harvested laaquadan from July 2 to July 30. ECO typically aims to collect canines from 50% of harvested animals, COVID restrictions limited the amount of sampling that could be conducted during harvests in 2021. Canine teeth and vibrissae were collected from 66 laaquadan. Canine teeth were stored at ECO. Vibrissae were archived at ECO for potential use in future studies such as stable isotope analysis.

Blubber and liver samples were collected from 6 harvested laaquadan and shipped to Hollings Marine Laboratory in Charleston, S.C. for long term storage (Appendix 1).

Tagged and entangled laaquadan

No flipper-tagged laaquadan were observed. One entangled laaquadan was captured, disentangled, and released during a harvest round-up. One entangled 5 year old laaquadan was sighted, but it was too big for safe capture (details in Appendix 1).

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. Two observation permits were issued to non-tribal members in 2021.

Hunting Results

Hunting mortality

Subsistence hunters took a total of 7 laaquadan from January 1, 2021 to May 31, 2021. Of the total taken, 6 (86%) were retrieved and 1 (14%) were struck and lost. Of the 6 laaquadan retrieved, 6 were juvenile males and none were female. Hunters may report the sex and age class of a struck and lost animal based on their knowledge of sexing and aging laaquadan from previous hunting experience, but for analysis purposes, the sex and age class of the 1 struck and lost laaquadan were recorded as unknown.

Hunting locations

Hunting effort was higher for laaquadan hunted in the water than on land due to laaquadan

behavior and the increased likelihood of encountering a harvestable animal while it is swimming versus resting on land. A total of 3 (43%) laaquadan were taken when the animal was in the water and 4 (57%) were shot when the animal was hauled out on land. All hunters are on land when they shoot laaquadan (i.e., no hunting from vessels occurs). The retrieval rate for laaquadan shot while the animal is in the water was 33% and 100% for laaquadan shot on land (Table 2). Laaquadan hunted in the water were hunted from two locations in 2021: Northeast Point and Reef Point, 4 laaquadan (100%) were retrieved. At Reef, 2 (66%) laaquadan were retrieved from the water and 1 (33%) were struck and lost.

Table 2. Hunting performance of laaquadan taken (inclusive of animals shot in the water and on land) on St. Paul Island, Alaska, in the 2021 season.

Laaquadaġ Location	Retrieved		Struck and Lost		Total
	Number	Percent (%)	Number	Percent (%)	
Water	2	66%	1	33%	3
Land	4	100%	0	0%	4
Total/Average %	6	86%	1	14%	7

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 older laaquadan in August or later.

Joint harvests for laaquadaadan and yearlings have been scheduled to concentrate harvest effort between August 1 and November 30. Three yearlings were taken during laaquadaadan harvests. The Co-Management Council implemented family style harvest of laaquadaadan. NMFS contracted an on-island representative to serve as an independent monitor for all 2021 harvests. ECO staff were not present to record weather conditions, drive and rest times at laaquadaadan harvests. In the future NMFS and ECO will continue to refine the monitoring schedule to ensure efficient coordination of data collection.

CONCLUSION

A total of 162 laaquadan were harvested during 21 harvest events within the 2021 harvest season. Juvenile males 2 years and older were harvested during 7 harvest events from July 2 to July 30, with 131 males and 1 female harvested. Laaquadaadan were harvested during 14 harvest events from August 27 to December 30, with 27 male laaquadaadan, 3 yearlings and 0 female harvested. Harvests for juvenile males 2 years and older were concluded on July 30. Harvests for laaquadaadan were held family style from August 27 to December 30. No harvests were conducted after December 30. Zero cases of mortality due to hyperthermia occurred, no inhumane acts were observed during harvests, and harvests were not accomplished in a wasteful manner.

A total of 7 laaquadan were hunted during the January 1 to May 31, 2021, hunting season. All retrieved laaquadan were male and one of unknown sex was struck and lost. No hunts occurred after May 31.

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