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COMIDA: Impact Monitoring for Offshore Subsistence Hunting, Wainwright and Point Lay, Alaska

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EXECUTIVE SUMMARY

In 2009, Stephen R. Braund & Associates (SRB&A) and Applied Sociocultural Research (ASR), under contract to the U.S. Department of Interior, Bureau of Ocean Energy Management (USDOI, BOEM), initiated monitoring efforts focused on offshore subsistence hunting for key marine mammals (bowhead and beluga whales, walrus, seals, and polar bears) in the two communities, Point Lay and Wainwright (Map 1), that are most proximate to recent Outer Continental Shelf (OCS) oil and gas leases and to currently anticipated offshore exploration and development in the Chukchi Sea. BOEM is the federal agency responsible for overseeing oil and gas leases on the OCS. SRB&A began the Chukchi Offshore Monitoring in Drilling Areas (COMIDA) study to establish updated subsistence baseline information in the Chukchi Sea area and monitor on an annual basis any significant changes in offshore subsistence harvest activities over time in the communities of Point Lay and Wainwright during the 2010, 2011, and 2012 boating seasons (i.e., March through October). The field researchers collected GPS tracks and waypoints from local subsistence hunters and had discussions with hunters about their trips to address the following study objectives:

- Collect and document baseline offshore subsistence data for the study communities to allow assessment of whether OCS oil development activities will result in changes to offshore subsistence hunting practices
- Determine whether subsistence hunting in the Chukchi Sea displays significant variation over time. This objective was stated as the following monitoring hypothesis for this project:
    - Monitoring Hypotheses 1: Offshore subsistence hunting patterns in the vicinity of Wainwright and Point Lay do not vary significantly from year to year.
- Determine whether variation can be attributed to offshore oil and gas industrial activities. This objective was stated as the following monitoring hypothesis for this project:
    - Monitoring Hypotheses 2: Variation in offshore subsistence hunting patterns is not related to offshore oil and gas activities.

Based on continuing discussion with knowledgeable community leaders and hunters and feedback received during community review meetings, SRB&A estimates that at least 75 to 80 percent of Wainwright and Point Lay offshore subsistence hunters participated in the study. In total 27 Wainwright individuals and 30 Point Lay individuals registered in the study during the course of the three study years (2010, 2011, and 2012). Of these participants, 17 provided GPS track data in Point Lay, and 24 provided GPS track data in Wainwright. The information provided by Point Lay and Wainwright participants provide a baseline characterization of offshore subsistence uses in several key topics including where did the participants go, what did they target, and when did they go. Data that can be used to address these topics include baseline indicators such as offshore hunting tracks, resources targeted, and months of offshore activities. Furthermore, variation or trends in these subsistence baseline indicators were put into context and explained through the environmental data (e.g., ice, wind, water conditions) and traditional knowledge provided by the participants.

Three marine mammal resources characterized the focus of offshore harvest activities for both communities based on reported purpose of all documented trips from 2010 to 2012. In Wainwright, these three were bearded seal, bowhead, and walrus. Wainwright's offshore hunting tracks during the three study years extended from as far south as Icy Cape north to Peard Bay. The farthest extent of hunting tracks ranged from approximately 26 to 32 miles offshore and up to 40 miles from Wainwright. The tracks located farthest offshore were associated with bowhead spring whaling (2010), bowhead fall whaling (2011), and walrus hunting (2012). The greatest densities of Wainwright tracks are located in a nearly continuous area up to 10 miles offshore from Pingorarok Pass to Point Franklin.

In Point Lay, bearded seal, bowhead, and beluga were the three resources that were the focus of residents' offshore marine mammal harvests activities. The majority of Point Lay's hunting tracks are located north from Omalik Lagoon to Icy Cape, although a few tracks were also recorded as far south as Point Hope and north as far as Wainwright. A large number of Point Lay hunting tracks are concentrated in Kasegaluk Lagoon. The furthest extent of offshore subsistence activity during the three study years ranged between 10 and 22 miles offshore with the farthest offshore track occurring west of Point Lay. In each study year, the tracks located farthest offshore were associated with bearded seal hunting (2010) and bowhead spring whaling (2011 and 2012).

In general, both communities took more offshore hunting trips in May than in April. In both communities, April and May offshore hunting activities are focused on the pursuit of bowhead whales in offshore leads in the ice. Other resources however may also be taken during these months. In Wainwright and in Point Lay, participants will hunt for waterfowl (primarily eiders) and seals during the spring months. Point Lay and Wainwright residents shifted their focus in June and July to seal hunting, particularly for bearded seal. Beluga hunting (particularly in Point Lay) and walrus hunting in Wainwright were also important hunting activities during June and July. Other non-marine mammal resources that were sought during the peak summer months included fish, waterfowl, eggs, and caribou. Except for June of 2010 in Point Lay and June of 2012 in Wainwright, July had the highest percentage of offshore hunting trips during all three study years. The frequency of offshore subsistence activities declined in August and September for both communities, although August was more active in Point Lay than in Wainwright. In Point Lay, offshore activities during the fall months were focused on caribou and berry harvests along the coast, although some sealing also occurs. Wainwright residents engaged in seal, walrus, and fishing activities during these months; although the majority of their fall subsistence activities are focused inland on resources such as caribou and fish. Wainwright also reported bowhead whaling trips in September of 2011. October activity increased in Wainwright for bowhead whaling. Because Point Lay does not typically try to harvest bowhead in the fall, the community took very few offshore hunting trips during October.

Over the course of the three study years, the study team, with the assistance of the traditional knowledge shared by project participants, identified a number of factors that influence and cause variation in offshore subsistence activities. These variables include several environmental factors in addition to human influences. Understanding how these environmental and human factors can influence offshore subsistence hunting activities is important in any future studies which may look at the influences of offshore development activity on local communities' subsistence practices. These variables discussed in this report include ice, wind, aircraft and vessel traffic, and other factors such as resource health or equipment failures. Participants' most significant and persistent concern is the absence of sea ice in general. Sea ice is of enormous importance to spring whaling (stable shorefast ice provides a secure platform for spring whaling camps and leads provide access zones for bowheads), and sealing, and walrus hunting (floating ice pans provide harvest/butchering platforms) because it makes it easier to spot, harvest, and butcher these animals. High winds and warm temperatures force residents to hunt in the open water which can reduce harvests. While there are additional reasons that could cause variation in a community's offshore subsistence hunting activities, the examples discussed in this report are ones clearly identified and experienced by participants during the three study years.

Three years of baseline offshore subsistence activities were documented in Point Lay and Wainwright. The study was well received by the local community and the community wished for the study to continue beyond the three years of data collection. In regards to the study hypotheses, the data collected in this study show that there is variation in offshore subsistence hunting activities due to ice conditions, wind conditions, aircraft and vessel traffic, and other reasons such as the health of resources or equipment failures. However, based on comments made during community reviews and by study participants, the three years of data did not capture the full extent of variation among all offshore subsistence activities to adequately characterize the offshore areas and hunting activities of either study community or ascertain how significant the physical variations in hunting tracks are from year to year. Whether variation in

offshore subsistence hunting patterns is related to offshore oil and gas activities could not be answered with the current data set as oil and gas activities were relatively limited in the Chukchi Sea during the study years or were too far offshore to cause hunters to report industry interactions during their subsistence activities for the three study years.

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LIST OF ACRONYMS AND ABBREVIATIONS

ASR	Applied Sociocultural Research
COMIDA	Chukchi Offshore Monitoring in Drilling Areas
GPS	Global Positioning System
IAI	Impact Assessment, Inc.
ISER	Institute of Social and Economic Research
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
SPSS	Statistical Package for the Social Sciences
SRB&A	Stephen R. Braund & Associates
USDOI, BOEM	U.S. Department of Interior, Bureau of Ocean Energy Management

GLOSSARY

Kivgiq - mid-winter Iñupiaq festival

Kaseluks – spotted seals

Maktak - whale skin with blubber

Natchiq – ringed seal

Siquliaq – young ice

Ugruk – bearded seal

Umiaq – skin boat

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CHAPTER 1: INTRODUCTION

In 2009, Stephen R. Braund & Associates (SRB&A) and Applied Sociocultural Research (ASR), under contract to the U.S. Department of Interior, Bureau of Ocean Energy Management (USDOI, BOEM), initiated monitoring efforts of offshore subsistence hunting for key marine mammals (bowhead and beluga whales, walrus, seals, and polar bears) in the two communities, Point Lay and Wainwright, that are most proximate to recent Outer Continental Shelf (OCS) oil and gas leases and to currently anticipated offshore exploration and development in the Chukchi Sea. BOEM is the federal agency responsible for overseeing oil and gas leases on the OCS. This study is part of the biological, socioeconomic, and sociocultural studies that BOEM sponsors to provide information to project, mitigate, and assess the effects of OCS oil and gas activities on the physical and human environments. Recent lease sales in the Chukchi Sea have resulted in this offshore monitoring study to collect baseline information, including information relevant to subsistence uses in the Chukchi Sea. Residents of Alaska's North Slope continue to rely heavily on both marine and terrestrial resources and use the offshore environment, including the Chukchi Sea, for subsistence purposes. The effects of OCS oil and gas activities on North Slope subsistence is an important component of BOEM research.

This study, entitled "COMIDA: Impact Monitoring for Offshore Subsistence Hunting, Wainwright and Point Lay, Alaska" will provide important data pertinent to management decisions resulting from the Chukchi Sea Lease Sale 193 held in February 2008, and future sales. BOEM seeks to establish updated subsistence baseline information in the area and monitor on an annual basis any significant changes in offshore subsistence harvest activities over time. SRB&A has previously conducted a number of subsistence baseline studies, several associated with BOEM sponsored initiatives, that documented and/or compiled subsistence data and traditional knowledge for North Slope communities (see SRB&A 2011, 2010a, 2010b, 2008; SRB&A and Institute of Social and Economic Research [ISER] 1993a, 1993b). Study team members include SRB&A, Mike Galginaitis of ASR, and Dr. Jack A. Kruse. ASR was instrumental in the initial phases of this project in helping develop the data collection methods, gaining community support for the project, and reviewing the results of the first year of data collection. Dr. Kruse assisted in post-field data processing and analysis. This final report provides the results of the 2010, 2011, and 2012 field seasons in Point Lay and Wainwright.

This report should be read with the following caveats in mind. First, although the study team made a concerted effort to include all offshore subsistence harvesters in the study, some harvesters in each community chose not to participate. Based on continuing discussion with knowledgeable community leaders and hunters and feedback received during community review meetings, SRB&A estimates that at least 75 to 80 percent of Wainwright and Point Lay offshore subsistence hunters participated. Thus, while this study does not represent the entire offshore subsistence activity of the study communities for the 2010, 2011, and 2012 field seasons, it does characterize the majority of their offshore subsistence efforts during the three study years.

Second, although subsistence harvests are described in this report, this study did not systematically collect all of Point Lay's or Wainwright's subsistence offshore harvest. While participants indicated their harvests were comparable to previous years, not all active community harvesters were engaged in this study. Furthermore, this study was not designed as a comprehensive subsistence harvest survey but as a Global Positioning System (GPS) subsistence tracking study that also documented harvest amounts for trips reported by study participants. Thus, the harvest amounts presented in this report should be used as a general characterization of offshore harvests by approximately 75 to 80 percent of community harvesters that were engaged in the study with the additional caveat that not all harvests were recorded for trips where participants forgot their GPS (see "Participant Harvests" for additional context regarding harvests not captured by the study). To capture total community offshore harvest amounts with confidence would require a comprehensive household harvest survey.

Lastly, although this study focused on offshore hunting for key marine mammals, certain resources such as fish, caribou, and berries are accessed offshore along the coast and were included in the study results when reported by project participants. However, these fish, caribou, and berry resources are also harvested at inland locations and the maps presented in this report showing these resources only represent coastal uses and not the entire community's use areas for these resources.

1.1 Study Objectives

Consistent with the purpose which seeks to provide current baseline data for the study area and to monitor on an annual basis any significant changes in marine subsistence harvest activities over time, SRB&A conducted fieldwork in Wainwright and Point Lay during the 2010, 2011, and 2012 boating seasons (i.e., March through October). The field researchers collected GPS tracks and waypoints from local subsistence hunters and held discussions with hunters about their trips in order to address the study objectives listed below. These data were used to develop the maps and tables presented in this report.

The objectives of this study are to:

- Collect and document baseline offshore subsistence data for the study communities to allow assessment of whether OCS oil development activities will result in changes to offshore subsistence hunting practices
- Determine whether subsistence hunting in the Chukchi Sea displays significant variation over time. This objective was stated as the following monitoring hypothesis for this project:
    - Monitoring Hypotheses 1: Offshore subsistence hunting patterns in the vicinity of Wainwright and Point Lay do not vary significantly from year to year.
- Determine whether variation can be attributed to offshore oil and gas industrial activities. This objective was stated as the following monitoring hypothesis for this project:
    - Monitoring Hypotheses 2: Variation in offshore subsistence hunting patterns is not related to offshore oil and gas activities.

The objectives of this final report are to:

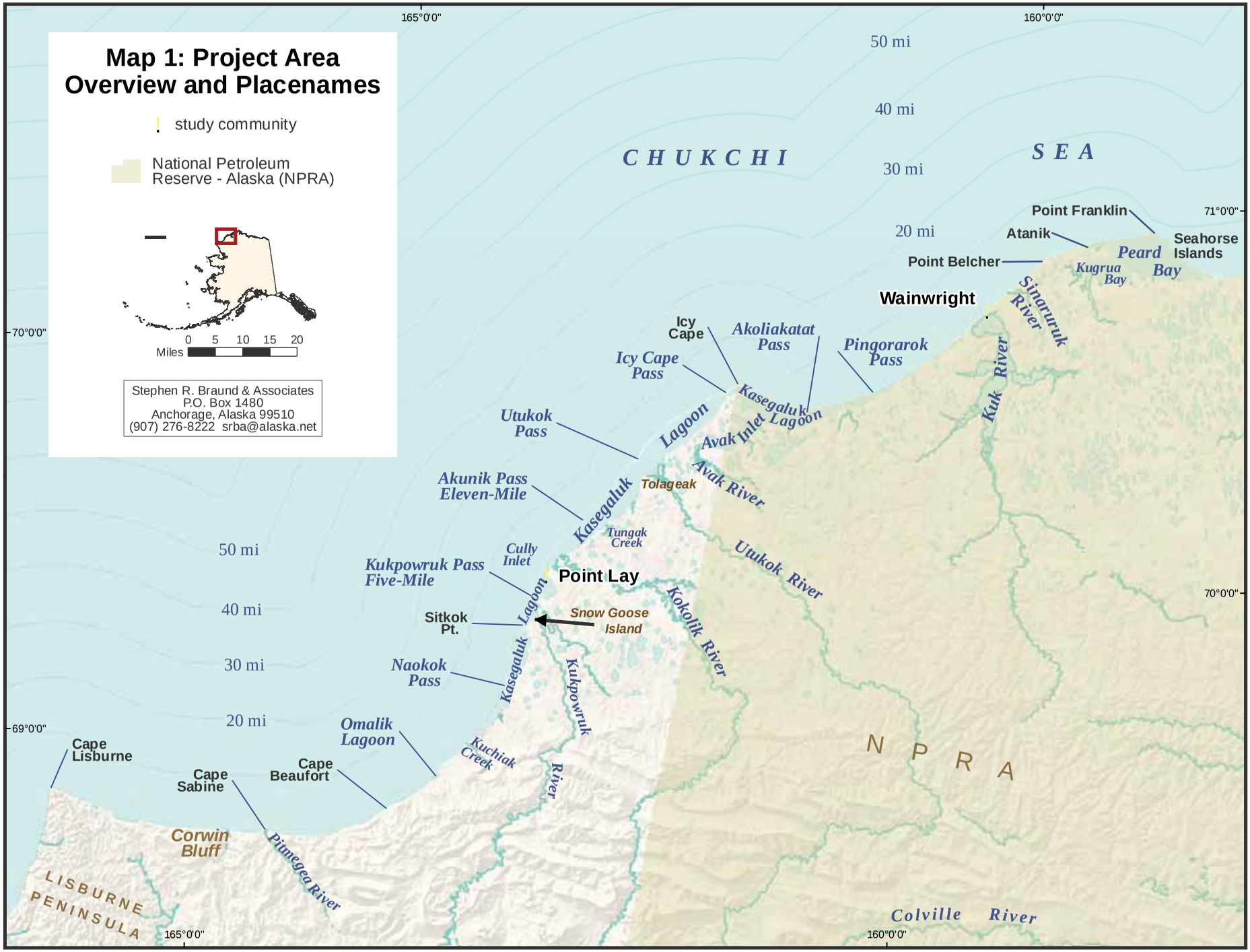
- Describe the methods used for data collection and analysis.
- Prepare and present the recorded 2010 through 2012 field data, including summaries of all GPS tracks, waypoints, and hunter observations.
- Summarize findings regarding hunting activities, hunting conditions, subsistence resource observations, and the 2010 through 2012 boating seasons overall.

1.2 Study Area

For the purposes of this report, the study area includes all offshore and coastal areas used by residents of Wainwright and Point Lay for subsistence activities involving key marine mammal resources. United States Geological Survey placenames for Wainwright and Point Lay are shown on Map 1.

1.3 Report Organization

This report is divided into six primary chapters that provide the introduction, methods, results (Wainwright and Point Lay), summary and discussion of the 2010, 2011, and 2012 fieldwork, and conclusions. Chapter 2 presents the methods for this study including the study team's project planning and process of acquiring Wainwright and Point Lay community approval for the study. Also described are the methods for fieldwork design and preparation, identifying and contacting project participants,


Map 1: Project Area
Overview and Placenames
study community
National Petroleum
Reserve - Alaska (NPRA)
0 5 10 15 20
Miles
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
165°0'0"
160°0'0"
71°0'0"
70°0'0"
69°0'0"
50 mi
40 mi
30 mi
20 mi
CHUKCHI SEA
Point Franklin
Atanik
Seahorse Islands
Point Belcher
Peard Bay
Kugrua Bay
Wainwright
Sinaruruk River
Kuk River
Icy Cape
Akoliakatat Pass
Pingorarok Pass
Icy Cape Pass
Kasegaluk Lagoon
Utukok Pass
Avak Inlet
Akunik Pass
Eleven-Mile
Tolageak
Avak River
Kasegaluk
Tungak Creek
Cully Inlet
Kukpowruk Pass
Five-Mile
Point Lay
Utukok River
Kokolik River
Sitkok Pt.
Snow Goose Island
Naokok Pass
Kukpowruk River
Omalik Lagoon
Kuchiak Creek
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
LISBURNE PENINSULA
NPRA
Colville River

field methods, and post-field data processing and analysis. Chapter 3 and Chapter 4 provides the detailed results of the 2010 through 2012 field work by study community. Each community discussion includes a description of each study year's offshore hunting activities and hunting conditions accompanied by relevant tables, figures, and maps. These descriptions are followed by a summary of end-of-season reviews and a comparison of 2010, 2011, and 2012 hunting activities to previous years. Chapter 5 contains a summary and discussion that provides an overview of the three study years and discussion of offshore hunting areas, target resources, and months of activity for the three study years. The chapter concludes with a discussion of the various factors that can cause variation in offshore subsistence activities from year to year. Chapter 6 presents SRB&A's final conclusions regarding the study and provides recommendations for improving similar future studies should they occur.

CHAPTER 2: METHODS

2.1 Project Planning and Community Approval

The USDOI, Minerals Management Service (now USDOI, BOEM) awarded SRB&A and ASR the contract for the COMIDA study in the spring of 2009. SRB&A sent introductory letters to describe the project to the following organizations:

- Alaska Eskimo Whaling Commission
- Arctic Slope Native Association, Ltd.
- Arctic Slope Regional Corporation
- Barrow Arctic Science Consortium
- City of Wainwright
- Cully Corporation
- Iñupiat Community of the Arctic Slope
- Native Village of Point Lay
- North Slope Borough Department of Wildlife
- Olgoonik Corporation
- Point Lay Whaling Captains Association
- Ukpeagvik Iñupiat Corporation
- Wainwright Traditional Council
- Wainwright Whaling Captains Association

The letters described the proposed project in relation to potential OCS exploration and development and stated the study team's intention to schedule a trip to Point Lay and Wainwright to present the project at a public meeting and seek community approval of the project. After experiencing delays in scheduling due to ongoing subsistence activities in both communities, the study team eventually conducted a public meeting in Point Lay on July 14, 2009 and in Wainwright on July 15, 2009.

In Point Lay, 43 individuals (in addition to children) were present at the public meeting, which ended with the Native Village of Point Lay and meeting participants approving the project and requesting that the study team return to the community as soon as possible to begin fieldwork. Native Village of Point Lay council members who were present at the meeting indicated that they would pass a resolution in support of the project at their next council meeting. Due to the late timing of this initial meeting in July, the study team was not able to begin fieldwork in Point Lay until late in the 2009 open water field season.

Twenty residents attended the July 15, 2009 meeting in Wainwright, with few marine mammal hunters present. Wainwright residents indicated they were receptive to the project, but that the study team would need to present the project when more marine mammal hunters were present and requested that the study team return to the community in September 2009 to hold another public meeting and schedule a meeting with the Wainwright Whaling Captains Association.

The study team made a second trip to Point Lay on August 4, 2009 to identify and hire a local research assistant, identify and meet with Point Lay active hunters, distribute GPS units and other participant materials, provide training to the research assistant and participating hunters, and initiate fieldwork. Because the offshore hunting season had already peaked by the time the study team initiated fieldwork in Point Lay, the 2009 field season was used as an opportunity to review and test the data collection method prior to the first full year of fieldwork.

The study team continued a dialogue with both the City of Wainwright and the Wainwright Whaling Captain's Association to schedule a second community meeting in Wainwright but was unable to do so due to scheduling conflicts until March 2, 2010. Twenty-four Wainwright residents were in attendance at the meeting, including the Mayor of Wainwright, the president of the Wainwright Whaling Captain's Association, the North Slope Borough Subsistence Specialist, the Director of Operations and Community Relations for Olgoonik Corporation, and local marine mammal hunters. Community members voiced support for the project and suggested that the field researchers return in March before the start of spring whaling to recruit prospective participants and distribute GPS units. With both Point Lay and Wainwright community approval prior to the beginning of the 2010 marine hunting season, the first full study year was initiated in April 2010.

2.2 Fieldwork Design and Preparation

Based on the BOEM description of work, SRB&A and ASR sought to obtain systematic observations and data collection on offshore hunting activities for the following categories:

- Number of hunting groups and composition
- Duration of hunting activities by active days
- Distance of hunt and area searched
- Number of prey harvested per trip
- Locations of harvest strikes, with direction and distance from shore
- Estimated costs per trip
- Report of any accidents or mishaps
- Report of weather conditions and ice conditions

SRB&A obtained and distributed GPS units to study participants and obtained and mounted weather stations in Wainwright and Point Lay. It is notable that the data in this report do not represent all areas used for marine subsistence or contain comprehensive harvest and search information that can be used to generalize for either community. The data collected only represent the trips reported by the study participants and provide a characterization of the communities' offshore subsistence uses for the study year for those participants. SRB&A developed a data collection and management guide for the project to facilitate thoroughness and consistency of field researchers' efforts, including local research assistants who were to be hired to help with data collection, data management, and supply distribution while the study team was away from the communities (Appendix B). SRB&A also created a data collection guide for participants to assist researchers in collecting and organizing GPS, harvest, wind and weather data in preparation for the post-hunt discussions. Detailed descriptions of pre-fieldwork tasks are provided in the following sections, and copies of the data collection guide can be found in Appendix B.

SRB&A also arranged to rent the Search and Rescue building in Wainwright and the Point Lay Community Center from April through October 2010, 2011, and 2012. The rental agreements provided a space to meet with participants and storage space to store supplies such as spare GPS units and batteries.

2.2.1 Global Positioning System (GPS) Units

GPS units were used to record the spatial documentation of offshore hunting activities and the acquisition of systematic observations on hunting activities. During the project planning and community approval stage of the project, the study team asked community members if they had a GPS unit preference, and hunters replied that they preferred the Garmin 76CSx GPS unit because it floats. Throughout the three study years, the study team obtained approximately 70 Garmin 76CSx GPS units; the units were prepared by pre-field testing each one and ensuring they were synchronized with identical settings and toggle

features. Some of these settings most pertinent to the project include enabling automatic tracking and configuring data storage options. Additional two gigabyte internal storage drives were inserted in each unit to supplement the unit's built-in memory. The serial number of each GPS was recorded in a database to facilitate device tracking, and packaged each GPS in a bag that included an instruction manual, a 12 volt adapter, spare batteries, a marine mounting unit, a field notebook, and pencils.

Field researchers instructed each hunter, upon receiving their GPS unit, how to record tracks and waypoints. Specifically, the GPS units recorded the date and time of offshore trips, the location and direction of the participant's trip, and provided the participant with an opportunity to mark marine mammal sightings, harvest sites, and unusual observations with waypoints. Participants were instructed to turn on their GPS unit prior to departing on an offshore trip and to keep the unit on until the trip concluded. Each GPS unit automatically recorded the location, direction of movement, and velocity of the unit as long as it was turned on. Participants were also instructed on how to make a waypoint for observations such as marine mammal sightings, harvest sites, and unusual observations during their offshore trips; these data recorded the time, latitude, longitude, and elevation of the waypoint and allowed the user to name the point (e.g., bowhead whale harvest). During post-hunt discussions, field researchers downloaded recorded tracks and waypoints onto a laptop computer and reviewed each one individually with participants to help guide the discussions. To facilitate this process, each participant was provided with a logbook for tracks and waypoints and a field notebook. Extra batteries were also left at the Point Lay Community Center and the Wainwright Search and Rescue Building and were brought to participants during subsequent field trips so that participants could replace depleted or dead batteries before taking additional offshore trips.

2.2.2 Weather Station Data

The study design included establishing weather stations in both communities to record local weather conditions during the boating season to allow correlation of weather conditions with hunting events. Prior to the beginning of the 2010 field season, the study team bought two Vantage Pro2 model weather stations from Davis Instruments and installed one on the Point Lay Search and Rescue building and the other weather station on the Wainwright Search and Rescue Building.

SRB&A had difficulties with the weather station in Wainwright throughout the 2010 field season. Based on these experiences in the field, SRB&A decided that the weather station design was inadequate for the high winds, fluctuating temperatures, and the propensity for ice buildup in project communities. SRB&A initially requested permission from BOEM to obtain more durable and reliable weather stations for the 2011 field season, but later decided that third party data would be sufficient to meet the needs of the study. In Point Lay, the Hoefler group, a contractor to Shell Oil Company, provided weather data to SRB&A, and in Wainwright, data were obtained from the National Oceanic and Atmospheric Administration (NOAA) website.

The weather station was removed from the Wainwright Search and Rescue building at the close of the 2010 field season. Over the winter, the study team dismantled the weather station, cleaned it, and ordered a replacement anemometer and wind vane from Davis Instruments. The study team remounted the weather station on the roof of the Wainwright Search and Rescue building in May 2011. The weather station recorded weather data without incident for the duration of the 2011 boating season. The study also collected NOAA weather data in Wainwright for the 2011 boating season.

A fall storm damaged the anemometer on the Point Lay weather station in 2011. SRB&A ordered a replacement anemometer from Davis instruments over the winter and replaced the Point Lay anemometer in the spring of 2012. Both the Wainwright and the Point Lay weather stations recorded weather data without incident for the duration of the 2012 boating season. The study team left both weather stations in the communities for continued local use at the close of the 2012 boating season.

A sample of weather station data collected by the Vantage Pro2 model in Point Lay is displayed in Appendix A, Table A-1. The Vantage Pro2 weather stations were used in Wainwright and Point Lay as backup sources to the weather data provided by NOAA (Table A-2) and the Hoefler group (Table A-3). Both communities indicated that the weather stations have proved valuable for use by the local Search and Rescue organizations.

2.2.3 Data Collection

Field researchers collected systematic ethnographic observations of hunting activities, weather conditions, and ice conditions. These data work in concert with those acquired from GPS units and weather stations to characterize offshore subsistence practices in the project communities. All necessary information was entered into a laptop computer by the researcher in the field. In 2010 this information was divided into four sections: (A) hunting activity details; (B) hunting conditions; (C) subsistence resource observations; and (D) waypoints or coordinates noted. A copy of the questions for each of these sections is included in Appendix B. During the course of the study, a few participants took offshore trips and did not bring their GPS with them or brought their GPS but did not turn it on. In 2010, to account for the missing tracks, the study team showed participants a summary and map of their trips taken during the year and asked participants if they had taken additional offshore trips that were not accounted for in the trip summary and map. If the participant answered that tracks were not recorded then the study team attempted to ascertain the number and purpose of the missing trips and summarized this information in the reporting.

In 2011, the study team implemented a new set of questions to address any missing data from unreported trips (e.g., forgot GPS) as well as assess the ability of the monthly field effort to adequately represent offshore subsistence activities in the two study communities. These questions addressed the period of time since the participant's previous meeting with the field researcher, and allowed participants to compare their downloaded GPS track totals with the actual number of offshore trips made over the same time period. In cases where participants reported more offshore trips than reflected on their GPS units, the study team attempted to obtain harvest information and encouraged the participants to try to record all offshore hunting activity trips on their GPS. The study team learned from experience that full discussions about offshore hunting trips without GPS data were not as accurate as it was more difficult for participants to recreate details from boating trips without the visual prompt of the accompanying GPS track and associated time series data. Given this constraint, the study team attempted to record the actual number of trips taken and harvest data, but did not ask questions for trips with missing tracks pertaining to the remaining details such as number of participants, date of departure and return, wind, weather, and trip costs.

Section (C), subsistence resource observations, was also removed from the 2011 guide and a modified version of this section was added as a trip summary section that focused on groups of trips rather than individual trips. These summary questions included queries about unusual wildlife observations (e.g., behavior, health, distribution, and abundance anomalies); these observations are included in the discussion of results from the end-of-season reviews which also recorded wildlife observations. The reason for this modification was that participants found it easier to discuss unusual wildlife observations for a group of similar trips (e.g., June hunting trips) rather than for each individual trip, particularly because some observations, such as abundance anomalies, were put in better context when reported for a longer period of time rather than for one trip. See Appendix B for a copy of the 2011/2012 questions.

The field researcher conducted end-of-season reviews with participants who participated in offshore hunting activities during the 2010 through 2012 boating seasons. The purpose was to provide an opportunity for study participants to compare the 2010, 2011, and 2012 boating season to previous boating seasons. The field researcher also used the end-of-season reviews to determine if any study participants had noticed any unusual weather or wildlife related observations, to solicit suggestions for subsequent years of the project, and to confirm whether or not they would be willing to participate in the next study year.

2.2.4 Research Assistants

BOEM requested the hire of a research assistant in each community to assist with the selection of participants, download tracks, and distribute supplies (e.g., batteries) as needed during the three boating seasons, and to provide local capacity building. The initial study design proposed a continual researcher presence in the community and the objective was to use local research assistants to fulfil this role with periodic visits from the study team every four to five weeks.

A research assistant was hired in Point Lay for the duration of the 2010 and 2011 boating seasons. The Point Lay research assistant proved most helpful in providing updated contact information for participants and continued to download tracks and provide supplies to participants. Researchers initially planned for the research assistant to meet with participants when the participants had acquired more than three or four tracks on their GPS. Feedback from field researchers and the research assistant concerning the difficulties in requesting participants to schedule their own session ultimately resulted in the research assistants being asked to keep an updated tally of tracks to inform the timing of each trip and research assistants were no longer asked to download the GPS tracks and collect hunter observations. As a result, the entire task of downloading the GPS tracks and collecting observations for each participant became the sole responsibility of the field researcher who traveled to the community approximately once a month. The study team was unable to hire a Point Lay research assistant during the 2012 field season.

The study team was unable to find a research assistant in Wainwright during the 2010 boating season. To address this need in 2011, the field researcher posted advertisements and asked community members for recommendations in an attempt to hire a research assistant but was ultimately unsuccessful. Employees at the Community Teleconference Center partially filled the role of research assistant by updating participant contact information and providing community activity updates. The study team was unable to hire a research assistant in Wainwright during the 2012 field season. During the three years of fieldwork, the study team was not successful in hiring local research assistants who had a continual research presence in the community and therefore the data collection for this project was primarily conducted in the periodic visits (e.g., every four to five weeks) by the study team.

2.3 Identifying and Contacting Project Participants

The study worked to identify participants for the project who were active in offshore subsistence activities. The study team preferred potential participants to also own a boat, but considered exceptions in cases where the participant regularly used another person's boat but did not travel with the owner. If a community member expressed interest in the study, the study team explained the purpose and methods of the study and provided them with a consent form which provided a list of benefits and risks associated with participating in the study.

Potential participants were initially identified in Point Lay during the July 2009 public meeting. After the public meeting, the Native Village of Point Lay administrator provided a list of 15 marine mammal hunters who were interested in participating in the study. During the August 2009 field trip to Point Lay the study team contacted individuals on the list of potential project participants, sought additional offshore hunters who were likely candidates for the study, and distributed 20 GPS units to interested Point Lay hunters.

Because community approval was not obtained from Wainwright until March 2010, identification of potential participants began later than in Point Lay. During the March 2010 trip to Wainwright, the community liaison office provided the field researcher with a list of marine mammal hunters. This list was brought to Wainwright Whaling Captains Association, and the president added additional names to the list. The study team called individuals on the list and invited them to participate in the study. Twenty GPS units were distributed to interested Wainwright hunters for the 2010 season.

Throughout the 2010 field season, several active offshore subsistence harvesters in each community whom were not originally contacted learned of the GPS study and asked to become participants. In each of these instances, these individuals were enrolled as project participants provided they were active in offshore hunting activities. In both communities there were active hunters who did not participate in the study because they either declined or the study team was unable to contact them.

Prior to the start of the 2011 and 2012 field seasons, the study team contacted all participants who were active participants in the study at the end of the previous field season. Nearly all participants in both communities who participated in the 2010 field season agreed to participate in the 2011 field season, and nearly all participants in both communities who participated in the 2011 field season agreed to participate in the 2012 field season.

In exchange for recording GPS tracks and meeting with the field researcher during each study year, the study team provided each participant with a drum of fuel in lieu of an honorarium at the request of the community participants. Vouchers were distributed twice during the season: once at the season's midpoint and once at the end. In order to qualify for a voucher for a given fuel distribution, each participant had to log tracks on his GPS between the last and current fuel distribution and meet with the field researcher about the tracks. If a participant qualified, he or she received a fuel voucher good for ½ a drum of fuel (27.5 gallons).

2.4 Data Collection Method

As previously stated, the purpose of having discussions with hunters was to collect systematic observations of hunting activities, weather conditions, and ice conditions associated with the tracks for each participant. In most cases the field researcher met the project participants in Point Lay at the community center and in Wainwright at the Olgoonik Restaurant. Each session typically began by downloading tracks and waypoints from the participant's GPS. The researcher then opened each GPS track file and asked the hunter the purpose of the trip; if a trip was not relevant to this study (e.g., inland rather than offshore hunting trip or trip around town) its purpose was recorded in an Excel file and the team moved on to the next trip. SRB&A developed the following definition of a hunting activity trip, which is the basic unit of analysis for this study:

> A single trip will usually start and end at the shore in front of Point Lay or Wainwright, even if it occurs over more than one day and even if the participant stops to camp during the trip. However, if a participant travels to a hunting camp and uses that camp as a base for further hunting activities, hunting trips that begin and end at the hunting camp will be considered separate trips. The travel between the hunting camp and the village will be considered two separate trips. Therefore, an entire trip should generally create a "loop" from the starting and ending spot, unless a participant is traveling to a hunting camp from which he conducts additional subsistence activities, in which case the first trip will begin at the village and end at the hunting camp, and the last trip will begin at the hunting camp and end at the village.

When talking with hunters, the field researcher used a guide to ensure that all necessary data had been collected, filling out the form on a laptop in Adobe Acrobat Pro. During this stage of the discussion, participants were asked to verify the accuracy of the GPS data and share information concerning hunting activities, weather conditions, and ice conditions during the trip (see above, under "Data Collection"). Each trip's GPS track and waypoint data were saved as a .gpx file in Garmin MapSource program at the conclusion of the session. Each track was renamed with a code, trip number, and date of trip. In some instances, participants remembered the location of a harvest site or wildlife sighting and manually added the waypoint during the session. The researchers were able to locate the approximate location of the harvest based upon the participant's description of when the harvest occurred and locating the precise track point that corresponded to the reported time.

2.5 Fieldwork Summary

In total, 27 Wainwright individuals and 30 Point Lay individuals registered in the study during the course of the three study years (2010, 2011, and 2012) (Table 1). Twelve of the 30 Point Lay participants were participants in all three study seasons and 20 of the 30 participated in at least two seasons. In Wainwright 19 of the 27 Wainwright individuals were participants in all three study seasons and 24 of the 27 participated in at least two seasons. Reasons that certain participants were not involved in all three study years include those who moved into the study community or away from the study community, those who withdrew due to lack of functioning equipment, or those who the study team was unable to make contact with during the course of an entire study year. As discussed above, SRB&A estimates that at least 75 to 80 percent of Wainwright and Point Lay offshore subsistence hunters participated. Of these participants, 17 provided GPS track data in Point Lay, and 24 provided data in Wainwright (see "Study Participants" section under "Results and Discussion" for reasons why certain participants did not provide tracks). Over the three study years, the study team provided 86 honoraria to the 24 Wainwright individuals that provided tracks and 60 honoraria to the 17 Point Lay individuals that provided tracks.

The study team originally intended to collect data by participant, assuming only one participant would provide data for a specific trip. As the study progressed, there were occasions where two participants traveled in the same boat and recorded the same boat track. In these cases, both participants provided observations about the hunting activity trip and recorded duplicate tracks. These "duplicate" tracks have been removed from the maps in this report to only display the 361 boat tracks in Wainwright and the 226 boat tracks in Point Lay. However, the tables in this report are based on hunter trips (i.e., hunting activity trips) and contain information reported by all participants including the participants who traveled and recorded the same trip in the same boat for 28 hunting trips in Wainwright and 14 hunting trips in Point Lay.

In Wainwright, the field researcher collected a total of 510 trips of which 391 were hunting activity trips. These 391 hunting activity trips represent 361 individual Wainwright boat tracks. As mentioned above, there were 28 trips recorded in this study in which two Wainwright participants traveled and recorded the same trip in the same boat; the remaining two hunting trips in 2010 do not have associated GPS track data. Point Lay participants reported 342 trips of which 244 were hunting activity trips. These 244 hunting activity trips represent 226 individual Point Lay boat tracks with 14 trips recorded in this study by two Point Lay participants who traveled in the same boat; the remaining four hunting trips in 2010 do not have associated GPS track data. In both communities, snowmachine trips to hunting areas (primarily associated with bowhead whaling) and other trips with hunting purpose not ascertained or not associated with hunting (e.g., search and rescue) accounted for the remaining tracks.

Throughout the boating season, the study team took seven to eight field trips to each community at four to six week intervals (Table 2). The goal was to travel to the communities approximately once per month during the boating season. In total, 23 fieldwork trips were to Wainwright and 21 trips were to Point Lay over the course of the three study years. The study team coordinated with participants in each community and the research assistant in Point Lay prior to scheduling trips in order to avoid traveling to communities during optimal boating conditions when hunters were less likely to be available or in town. Precise timing of trips depended on the number of hunting trips taken since the last community visit, community activities, and weather conditions.

Table 1: Fieldwork Summary – All Study Years Combined

Fieldwork Summary	Wainwright	Point Lay
Number of Study Participants (all three years combined)	27	30
Number of Study Participants Providing Tracks	24	17
Total Number of Boat Hunting Tracks	361	226
Total Number of Hunting Activity Trips*	391	244
Total Number of Trips (including snowmachine and other trips)	510	342
Honoraria Distributed (½ drums of fuel)	86	60
Number of Researcher Field Trips to Communities	23	21
*Four of the hunting activity trips in Point Lay and two of the hunting activity trips in Wainwright do not have associated GPS tracks		

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Table 2: Fieldwork Trip Dates – All Study Years

Date	Wainwright	Point Lay
2010	March 23-25, 2010 April 19-21, 2010 May 26-29, 2010 July 2-5, 2010 August 4-6, 2010 September 6-9, 2010 October 10-11, 2010 December 6-7, 2010	April 21-23, 2010 May 23-26, 2010 June 29-July 2, 2010 August 2-4, 2010 August 31-September 5, 2010 October 13-14, 2010 December 8-10, 2010
2011	March 28-30, 2011 May 31-June 2, 2011 June 13-14, 2011 June 29-July 1, 2011 July 24-26, 2011 August 22-27, 2011 October 6-7, 2011 November 14-19, 2011	March 31-April 1, 2011 June 3-4, 2011 June 26-28, 2011 July 27-29, 2011 August 28-September 1, 2011 October 2-6, 2011 November 20-23, 2011
2012	April 4-5, 2012 May 29, 2012 June 24-29, 2012 July 23-26, 2012 August 27-29, 2012 September 29-October 1, 2012 October 30-November 2, 2012	March 25-April 3, 2012 May 20-28, 2012 July 5-7, 2012 July 26-28, 2012 August 30-September 1, 2012 October 1-3, 2012 November 16-17, 2012

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2.5.1 2010 Field Season

Table 3 provides a summary of the 2010 fieldwork conducted in Wainwright and Point Lay between March 23 and December 10, 2010. Twenty people were registered as study participants in Point Lay at the beginning of the 2010 season. Three participants withdrew or moved during the year, and two community members joined the study. By the end of the year there were 19 individuals registered as study participants. The field researcher recorded 89 trips from Point Lay participants, of which 57 hunting activity trips (one of which had multiple participants recording the same trip). A total of 15 fuel vouchers were distributed to Point Lay study participants.

At the beginning of the boating season in Wainwright there were 20 community members registered as study participants; by the end of the season, one participant had withdrawn from the study and three community members had joined the study. The study team closed out the 2010 season with 22 Wainwright residents registered as study participants. During the season, the field researcher recorded 170 trips from Wainwright participants, of which 122 were hunting activity trips. Nine hunting trips had multiple participants recording the same trip resulting in 111 unique boat tracks recorded in 2010; two hunting trips had no GPS data associated with them. A total of 24 fuel vouchers were distributed to Wainwright study participants.

Table 3: 2010 Fieldwork Summary

2010 Fieldwork Summary	Wainwright	Point Lay
Number of Study Participants (at beginning of season)	20	20
Number of Study Participants (at close of season)	22	19
Total Number of Boat Hunting Tracks	111	52
Total Number of Hunting Activity Trips*	122	57
Total Number of Trips (including snowmachine and other trips)	170	89
Honoraria Distributed (½ drums of fuel)	24	15
Number of Researcher Field Trips to Communities	8	7
*Four of the 57 hunting activity trips in Point Lay and two of the 122 hunting activity trips in Wainwright did not have associated GPS tracks in 2010.		

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2.5.2 2011 Field Season

Table 4 provides a summary of the 2011 fieldwork conducted in Wainwright and Point Lay between March 28 and November 23, 2011. Nineteen people were registered as study participants in Point Lay at the beginning of the 2011 season. No participants were added and no participants declined to participate during the season. The field researcher recorded 114 trips from Point Lay participants, of which 70 were hunting activity trips. Eight of the 70 hunting trips had multiple participants recording the same trip in the same boat resulting in 62 unique boat tracks for the study year. A total of 22 fuel vouchers were distributed to Point Lay study participants.

At the beginning of the boating season in Wainwright there were 21 community members registered as study participants; by the end of the season five community members had joined the study. The study team closed out the 2011 season with 26 Wainwright residents registered as study participants. During the season, the field researcher documented 132 hunting activity trips. Eleven of the trips had multiple participants recording the same trip resulting in 121 unique boat tracks recorded in 2011. A total of 33 fuel vouchers were distributed to Wainwright study participants.

Table 4: 2011 Fieldwork Summary

2011 Fieldwork Summary	Wainwright	Point Lay
Number of Study Participants (at beginning of season)	21	19
Number of Study Participants (at close of season)	26	19
Total Number of Boat Hunting Tracks	121	62
Total Number of Hunting Activity Trips	132	70
Total Number of Trips (including snowmachine and other trips)	155	114
Honoraria Distributed (½ drums of fuel)	33	22
Number of Researcher Field Trips to Communities	8	7

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2.5.3 2012 Field Season

Table 5 provides a summary of the 2012 fieldwork conducted in Wainwright and Point Lay between March 25 and November 17, 2012. In Point Lay 17 people were registered as study participants at the beginning of the 2012 season. One individual was added during the season and another individual was removed due to a death during the field season. Thus the total number of participants remained at 17 at the close of the 2012 field season. The field researcher recorded 139 trips from Point Lay participants, of which 117 were hunting activity trips. Five of the 117 hunting trips had multiple participants recording the same trip in the same boat resulting in 112 unique boat tracks recorded in 2012. A total of 23 fuel vouchers were distributed to Point Lay study participants.

At the beginning of the boating season in Wainwright there were 22 community members registered as study participants; by the end of the season all 22 participants remained. During the season, the field researcher recorded 185 trips from Wainwright participants, of which 137 were hunting activity trips. Eight of the trips had multiple participants recording the same trip resulting in 129 unique boat tracks recorded in 2012. A total of 29 fuel vouchers to Wainwright study participants in 2012.

Table 5: 2012 Fieldwork Summary

2012 Fieldwork Summary	Wainwright	Point Lay
Number of Study Participants (at beginning of season)	22	17
Number of Study Participants (at close of season)	22	17
Total Number of Boat Hunting Tracks	129	112
Total Number of Hunting Activity Trips	137	117
Total Number of Trips (including snowmachine and other trips)	185	139
Honoraria Distributed (½ drums of fuel)	29	23
Number of Researcher Field Trips to Communities	7	7

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2.6 Post-field Data Processing

The study team developed an Access database with data fields that corresponded to the information collected during fieldwork. At the close of each field season, each participant's trip and associated data were entered into the Access database. Data entry also consisted of transferring all original tracks and waypoints into ArcGIS for spatial analysis. Following data entry, a quality control check of all the data previously entered was performed. Analytic tables summarizing the data collected in the field were created using the Statistical Package for the Social Sciences (SPSS). Final maps of tracks and waypoints were prepared using ArcGIS.

2.6.1 Data Entry

The Access database contained four tables used in the analysis: Hunting Activity Details, Hunting Conditions, Waypoints or Coordinates Noted, and Vessel. Data for each section (e.g., (A) hunting activity details, (B) hunting conditions) were entered into the corresponding Access table. Each record in a table corresponded to an individual participant's trip with fields within each table that contained the information pertaining to that specific trip (e.g., departure date, number of boats, trip purpose, ice conditions, and harvest waypoints). Each record contained a unique identifier that included a code followed by the trip number and date of trip to provide anonymity. The Vessel tables included information on the size, length, and call sign of each participant's vessel(s), the type of outboard motor on the vessel(s), and the participant's whaling crew, if applicable.

During data entry, the GPS track and waypoint data for each trip was crosschecked with the trip data collected to ensure consistency between the two sets of data. In some cases, participants periodically turned their GPS on and off during their hunting trip. This resulted in many short GPS tracks that all pertained to a single trip. These were later merged under one trip code during GIS file preparation. Other data entry steps included deleting unrelated track points (e.g., track from the participant's house to the boat) and renaming waypoints with a unique identifier that included a code, waypoint number, and date of trip. It should be noted that multiple participants may have recorded similar tracks and waypoints (e.g., two individuals recorded the harvest location for one bowhead whale, or two individuals went on the same seal hunting trip). These similar or duplicate waypoints and tracks were removed during GIS file preparation although the observations by participants from these duplicate tracks were included in data entry and reporting. After completion of data entry, SRB&A performed a quality control check of all data

previously entered. This consisted of a detailed review of GPS tracks and waypoints, hunter observations, and database records and resulted in all data entry being checked for accuracy and consistency.

Changes to the Access database during the 2011 boating season reflected the modifications made after the close of the 2010 boating season. A separate table was added to provide additional space for notes. The Subsistence Resource Observations table was removed as data for this section was no longer collected for each trip.

2.6.2 Analytic File Preparation

In order to analyze and summarize the data into meaningful variables which characterize Point Lay and Wainwright offshore subsistence activities, SRB&A analysts exported the database from Access to SPSS. The variables are based on data categories requested for analysis in the scope of work for this study. Table 6 provides the data categories requested by the scope of work with the associated final analytical variables chosen for this report.

Table 6: Scope of Work Data Categories and Corresponding Analytic Variables Selected for Reporting

Scope of Work Data Category	Analytic Reporting Variable
Number of Hunting Groups and Composition	Number of Trip Participants in Hunting Party, Composition of Boat Crew by Relationship, Number of Males and Females in Boat Crew, Composition of Boat Crew by Males and Females
Duration of Hunting Activities by Active Days	Duration of Trip, Active Offshore Hunting Hours
Length of Hunt and Area Searched	See Section 2.6.3 GIS File Preparation
Number of Prey Harvested	Species Harvested by Hunting Activity Trip
Locations of Harvest Strikes	See Section 2.6.3 GIS File Preparation
Estimate Costs Per Unit Effort of Harvest	Total Cost by Trip, Average Trip Costs, Hunting Activity Costs by Item,
Report of Any Accidents or Mishaps	Percentage of Trips with Safety/Access Issues
Report of Weather Conditions and Ice Conditions	Hunter Reported Weather Conditions on Hunting Trips, Reported Ice Conditions on Hunting Trips, Hunter Reported Average Wind Speed on Hunting Trips, Hunter Reported Wind Direction on Hunting Trips, Hunter Reported Condition of Water on Hunting Trips, Did Weather Influence Hunt, Type of Weather Influence on Hunting Trips
	Additional Variables added to Reporting: Total Number of Trips, Trip Purpose, Time of Departure for Hunting Activity Trips, Month of Departure, Primary Target and Harvested Species by Month

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The following text presents a list of the analytic variables run in SPSS that were tabulated for Point Lay and Wainwright as well as a brief discussion of what each variable represents:

- **Total Number of Trips** – this variable represents the total number of reported trips and includes hunting activity trips, snowmachine trips to hunting areas (primarily associated with bowhead whaling), and other trips not associated with hunting (e.g., search and rescue). Other than the maps showing their location, snowmachine tracks to hunting areas and other trips not associated with hunting are not discussed in the following sections and are not represented in subsequent tables because they were not considered hunting activities. Offshore snowmachine trips are generally associated with spring whaling; residents typically undertake offshore snowmachine trips to break trail, to check on leads in the ice, or to set up whaling camp. In a few instances, participants reported using snowmachines to harvest marine mammals or eider ducks, or in one case, a four-wheeler to harvest bearded seals along the beach; these trips were included in the hunting activity trips.
- **Trip Purpose -** participants were asked to provide the target species for each trip (i.e., the primary hunting purpose of the trip). In a number of instances, the trip purpose or target species may not have been the species that were harvested by participants (see following variable).
- **Species Harvested by Hunting Activity Trip** - harvest amounts only represent reported harvests of the study participants and are not generalizable to the entire community, except in the cases of beluga and bowhead whales where accurate community-level harvests are shown based on other studies which document the harvest of these marine mammals each year. The current study was not a systematic subsistence harvest assessment in the communities, and the harvest data presented in this report are not representative of the entire community's harvests.
- **Duration of Trip** - participants were asked to verify the time of departure and return for each GPS track. The duration of trip data presented in this report only includes data for complete trips or trips when the participant could recall the time of departure and return. Trips in which the participant forgot to turn on the GPS at the start of the trip or for which they turned the GPS off before returning to shore were not included in the analysis of duration as they would result in reporting shorter trips in general. Duration of trip is based on the length of time away from the community or camp. If a participant went to a camp for three days and took three six hour hunting trips from their camp on each of those days, the duration of trip is calculated based on the length of time for each of the three hunting trips (e.g., six hours) and not the entire time away from the community (e.g., three days).
- **Time of Departure for Hunting Activity Trips –** this variable represents the time when participants left the study community and only includes those trips in which the participant turned the GPS on prior to leaving the community or could remember the time of departure.
- **Active Offshore Hunting Hours –** this variable shows the times of day in which participants were engaged in offshore hunting activities. This variable is only based on trips with complete duration data and not partial trips.
- **Month of Departure –** represents the month in which the hunting activity occurred.
- **Primary Target and Harvested Species by Month –** this variable compares the reported purpose/target species with the species that were reported harvested during each month. This figure is useful in showing the opportunistic nature of offshore subsistence hunting as the initial target species is not always the species that is harvested by participants
- **Number of Trip Participants in Hunting Party -** each participant reported the number of hunting trip participants for each trip. A trip participant is defined as someone who participated in a particular hunting activity, regardless of whether he or she was in the participant's boat or in another boat in the hunting party.

- **Composition of Boat Crew by Relationship –** this variable represents the relationship of each individual in the boat (i.e., crew) to the participant. These data were only collected for the boat crew and not the entire hunting party.
- **Number of Males and Females in Boat Crew –** this variable provides the number of males and females present in a boat crew.
- **Composition of Boat Crew by Males and Females –** this variable provides the percent of trips with males present and females present.
- **Total Cost by Trip -** participants reported how much they spent on fuel, ammunition, food, and any other costs, excluding capital costs for equipment and hunting accessories, associated with each trip.
- **Average Trip Costs –** this variable represents the average cost of a trip including average spent on fuel, ammunition, food, and other costs.
- **Hunting Activity Costs by Item –** this variable provides a distribution of costs by fuel, ammunition, food, and other costs.
- **Hunter Reported Weather Conditions on Hunting Trips -** participants reported weather conditions for each hunting trip. During short hunting trips weather conditions usually remained stable, but weather conditions sometimes changed during longer trips and occasionally caused participants to return home due to deteriorating conditions. In these cases, participants typically reported multiple conditions when asked what the wind, weather, and boating conditions were for each trip
- **Reported Ice Conditions on Hunting Trips -** In addition to observations about weather conditions, participants reported on the ice conditions for each boating trip using four pre-defined variables of compact ice, open ice, open water, and ice free (Sechrist, Fett, and Perryman 1989).
    - Compact ice refers to conditions in which there is no visible open water on the ocean. Residents are not able to take their boats out when compact ice is present, though such conditions are ideal for snowmachine travel.
    - Open ice refers to situations where shorefast ice is present and the pack ice concentration is four-tenths to six-tenths of the surface, and there are enough open leads to permit limited boating. Open ice is most commonly used to describe conditions associated with spring bowhead whale hunting, when shorefast ice is present but open leads allow access to marine resources.
    - Open water refers to situations where the ocean is mostly thawed (less than one-tenth ice concentration on the surface) and there is no landfast ice. Blocks of ice are floating on the water, or there may be a thin sheet of brittle new ice. Ice is less of a hindrance to movement during open water conditions than it is during open ice conditions, but it may still constitute a hazard. Residents often hunt seals and walrus during open water conditions as these resources are often found and harvested on floating ice.
    - Ice free conditions are those in which there is no ice present in the ocean.
- **Hunter Reported Average Wind Speed on Hunting Trips –** this variable represents the wind speed per trip as reported by participants. In cases where a participant reported more than one wind speed for a given trip, the study team averaged the reported wind speeds.
- **Hunter Reported Wind Direction on Hunting Trips –** this variable represents the dominant wind direction during a hunting trip as reported by participants.

- **Hunter Reported Condition of Water on Hunting Trips -** participants reported on the water conditions for each boating trip using three pre-defined variables of calm, choppy, and rough:
    - calm conditions generally refer to waves or swells under two feet,
    - choppy conditions generally refer to waves or swells between two and four feet,
    - rough conditions generally refer to conditions where waves or swells exceed four feet.
- **Did Weather Influence Hunt –** this variable represents hunter responses to whether the weather influenced their trip in some way (either positively or negatively). This study did not capture the extent to which poor weather or wind resulted in hunters not embarking on a hunting trip but only documented the influence of weather once out on the water.
- **Type of Weather Influence on Hunting Trips –**participants were asked to categorize what aspect of the weather influenced their hunt based on the categories of precipitation/visibility, wind, water conditions, or ice conditions.
- **Percentage of Trips with Safety/Access Issues -** participants were asked a series of safety and access questions about each hunting trip. The safety and access questions were designed to collect information on boating hazards, accidents, increased costs, and meat spoilage. Where a participant indicated that they had experienced one of the safety or access issues, they were asked to provide an explanation.

2.6.3 GIS File Preparation

Using a variety of computer mapping software including MapSource, DNR Garmin, and ArcGIS, SRB&A staff checked the original Point Lay and Wainwright GPS tracks and waypoints for consistency and exported files from each study participant to ArcGIS shapefiles. SRB&A staff then combined all individual shapefiles into two feature classes, one for tracks and one for waypoints, within an ArcGIS personal geodatabase. Using tables from the Access database which contain a unique feature code for each track or waypoint, SRB&A staff was able to query the ArcGIS feature classes for specific information. Maps were created and queried for the following variables depending on data availability:

- **All Tracks and Waypoints** – this map represents the total number of tracks and waypoints reported to the study team and include hunting activity trips, snowmachine trips to hunting areas (primarily associated with bowhead whaling), and other trips that were either not associated with hunting or for which the purpose of the trip was not ascertained.
- **Hunting Tracks for each Community** – this set of maps represent the total number of hunting activity trips for Wainwright and Point Lay.
- **Hunting Tracks by Specific Resources** – this set of maps includes all tracks associated with offshore subsistence hunting by species. Maps of hunting tracks by specific resources were queried based on two variables: 1) participants reported purpose of trip, or 2) if the resource was harvested on the trip regardless of original purpose of trip. For example, a map of seal harvests would include those trips in which participants reported leaving Wainwright to search for seals and also those trips where participants reported looking for another species (e.g., eiders) and harvesting a seal while in search of eiders.
- **Hunting Tracks by Month** – this set of maps includes all hunting tracks by month of activity.
- **Hunting Tracks by Ice Conditions** – this map shows all hunting tracks by associated ice condition (i.e., open ice, open water, ice free).
- **Hunting Tracks by Duration of Trip** – this map shows all hunting tracks by four hour trip duration categories.

- **Wildlife Sightings** – This map shows the total number of wildlife sightings as reported by participants in 2010. These sightings do not represent the total number of wildlife sighted by participants during the 2010 boating season but only those for which the participants remembered to mark a waypoint. Due to the inconsistent nature with which wildlife observations were recorded in 2010, and the difficulty of extrapolating meaningful information from the collected data, the study team decided to end the practice of recording wildlife sightings at the close of the 2010 boating season. On many occasions, participants reported that wildlife was so abundant that it is not possible to accurately capture all wildlife sightings. Prior to the start of the 2011 boating season, participants were informed that they no longer needed to mark waypoints for wildlife sightings. The study team asked participants to limit the marking of waypoints to harvest sites and unusual observations.
- **Harvest Sites –** this set of maps shows all reported harvest sites/strikes by study year. These harvest sites do not represent the total number of subsistence resources harvested by participants during the three study years. Participants often expressed difficulty in remembering to record the harvest of each resource at the exact time and place of harvest as they were generally preoccupied with the harvest.

2.7 Community Review Meetings

SRB&A conducted two community review meetings in both Point Lay and Wainwright during the course of the study during which community residents reviewed the results of the study and provided comments. The first meeting occurred in January of 2012 and reviewed the results of the 2010 and 2011 study years. The second meeting occurred in November 2013 and reviewed the results of all three study years. Community residents' comments and input during the meetings were incorporated into this final report.

CHAPTER 3: WAINWRIGHT

Chapter 3 presents the results of data collection efforts for the 2010, 2011, and 2012 study years in Wainwright (Chapter 4 contains the results for Point Lay). This chapter provides descriptions of each community's hunting activities including location, timing, duration, number of participants, harvests, and costs. This information is followed by descriptions of hunting conditions during each study year including weather and ice conditions and safety and access topics. Each community section concludes with a summary of each study year based on end-of-season and trip summary questions that provide context and traditional knowledge for the data presented in the previous sections.

The community of Wainwright is located approximately 85 miles southwest of Barrow on a spit that separates Wainwright Inlet from the Chukchi Sea (Map 1). The community was named by Captain F.W. Beechey for Lt. John Wainwright who "discovered" the inlet during a British Polar expedition in 1826 to discover the Northwest Passage and map the coast of North America (Baker 1906). Traditional residents of the region included the Kuugmiut, or people of the Kuk River, and the Utuqqaqmiut, people of the Utuqqaq (Utukok) River. These people whaled at locations including Ataniq at the base of Point Franklin and at Icy Reef near Point Lay, harvested seals along the coast, and hunted caribou and fished along the river systems of the area, with trade fairs held in the spring and fall at several locations nearby (SRB&A and ISER 1993a). In the late 19th century, commercial whaling and fur hunting introduced the wage economy to the area, where complex barter and trade systems based on exchanging coastal and inland products between a web of social and family connections had been previously in place. Commercial sea mammal harvests may have also depleted the natural wealth of the region and resulted in starvation and misery for permanent residents (Chance n.d.).

The modern community was established in 1904 when a mission school was built there by the Department of Education, with John H. Kilbuck, formerly of the Moravian Church mission at Bethel, placed in charge of education and reindeer herding. The location was selected to support the general welfare of residents, facilitate communication with Barrow, and to serve as an alternate destination for the Revenue Cutter Service and commercial ships which could not reach Barrow one year in three due to short periods of open water (Jackson 1904; USDOI, Bureau of Education 1904). Reindeer herding flourished in the 1910s and 1920s, declined in the 1930s and continued until the early 1950s. Wage labor during and after World War II paid higher wages and let residents live in town rather than follow the herds, as reindeer tended to wander off with wild caribou and suffered from predators and parasites (Chance n.d.; Stern, Arobio, Naylor, and Thomas 1980). During the Cold War increasing investment in defense infrastructure made more wage jobs available, and new sources of income such as transfer payments increased the importance of the cash component of the mixed subsistence-cash economy.

Wainwright Inlet is listed in the 1890 census as consisting of 72 persons in 19 families with 17 houses, distributed in several settlements including "Kugmiut, camps on the Kug River, Setorokamiut, Nuklwak, Nutuago and Shinnowok" (Porter 1893). The population grew from 84 in 1910 to 556 in 2010, 501 (90 percent) of whom were Alaska Native or American Indian (SRB&A and ISER 1993a; U.S. Census Bureau). Wainwright residents have relied upon subsistence resource harvests for food; in 1988-1989 each household had available an average of 2,054 usable pounds of subsistence foods (SRB&A and ISER 1993a: Table 19). For additional information and comprehensive discussions of Wainwright's offshore and inland subsistence activities, the reader is referred to earlier subsistence studies conducted in Wainwright including Nelson 1981, Luton 1986, Ivie and Schneider 1988, SRB&A and ISER 1993a, and George and Fuller 1997.

3.1 Study Participants

Table 7 provides a frequency distribution of the status of study participants at the close of the boating seasons. The field researcher obtained tracks and recorded observations from16 participants during the 2010 boating season. One additional participant reported to the study team that they had tracks, but they

were unable to meet with the field researcher due to scheduling conflicts. Four participants reported that they did not go out at all during the boating season. One participant was unavailable for the duration of the season. The study team obtained tracks and recorded observations from 20 participants during the 2011 boating season. Two additional participants provided tracks but did not stay to report their observations due to personal scheduling conflicts. Two participants reported that they did not go out at all during the boating season, and two participants reported that they forgot to bring their GPS with them during boating trips. Of the 22 participants in 2012, the study team obtained hunting tracks and downloaded data from 16 participants over the course of the season. One individual provided tracks, but did not have time to report their observations, and the field researcher was unable to successfully schedule a follow-up discussion with that person. For the remaining participants, three individuals did not go boating all year and two forgot their GPS on boating trips.

Table 7: Status of Wainwright Participants at Close of Season

Status	Number of Participants		
	2010	2011	2012
Obtained Tracks and Reported Observations	16	20	16
Obtained Tracks but Did Not Report Observations		2	1
Did not go Boating all Season	4	2	3
Unavailable to Schedule	1		
Unable to Contact	1		
Did not Bring GPS on Boating Trips		2	2
Total	22	26	22

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Table 8 provides a frequency and percentage distribution of Wainwright participants by age, including participants who did not submit GPS tracks or conduct discussions with the field researcher during the 2010 through 2012 boating seasons. Percentages showed little change across study years with the greatest change occurring in the number of participants added in the 50-59 age category. In 2010 and 2011 years, the 20-39 age range accounted for approximately half of the participants with a slight decrease in the 20-39 age range in 2012. The number of participants in the 50-59 age range doubled from 2010 to 2011/2012. The age group of 60 and over accounted for the fewest number of participants in all study years. The majority of participants reported Wainwright as their residence at the time of birth. Table 9 provides a frequency and percentage distribution of the number of years participants have lived in Wainwright. All but one participant reported living in the community more than 20 years. One participant reported that they had lived in the community between 11 and 19 years.

Table 10 lists all vessels in Wainwright involved in the study; these represent the vast majority of operable boats at the time of the study in the community. Six participants reported owning two boats involved in the study; one participant reported owning three boats; and one participant reported owning four boats. All other participants reported owning one boat. Lund and Alumaweld were the most common brand of boats used during the study. For both study years, vessels ranged in length from 14 to 24 feet with many of the boats being 18 feet. There was considerable variation in outboard motor horsepower, with reported horsepower ranging from 25 to 220.

Table 8: Age of Participants in Wainwright

Age	2010		2011		2012	
	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants
20-29	6	29%	6	23%	5	23%
30-39	5	24%	6	23%	4	18%
40-49	4	19%	5	19%	4	18%
50-59	3	14%	6	23%	6	27%
60 and over	3	14%	3	12%	3	14%
Total	21	100%	26	100%	22	100%

Notes: Percentages are rounded to the nearest whole percent for all tables. Such percentages are easier to read and correspond to the real level of precision of the data. Rounding occasionally means that a set of tabulated percentages does not exactly total 100 percent.

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Table 9: Years of Residence in Wainwright

Years of Residence in Wainwright	2010		2011		2012	
	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants
11-19 years	1	5%	1	4%	1	5%
20 plus years	21	95%	25	96%	21	95%
Total	22	100%	26	100%	22	100%

Stephen R. Braund & Associates, 2013.

Table 10: Wainwright Vessels Involved in the Study

Participant	Vessel Type	Vessel Length (ft)	HP Motor
1	Lund	18	50
2	Lund	18	70
3	Alumaweld	20	115
3	Riverhawk	18	90
4	Lund	18	60
5	Lund	18	60
6	Alumaweld Ocean Pro	18	75
7	Ocean Pro	18	60
8	Carolina Skiff	24	115
9	Woolridge	18	90
10	Alumaweld	22	90

Participant	Vessel Type	Vessel Length (ft)	HP Motor
11	Lund	18	70
11	Lund	14	40
12	North River	22	90
13	Lund	18	85
14	Lund	18	60
15	Lund	18	55
16	Lund	22	75
17	Alumaweld	21	70
17	Lund	16	60
17	Jon	18	25
18	Aurora	22	115
19	Alumaweld Striker	19	90
19	Woolridge Inboard	22	50
19	Woolridge Inboard	20	75
19	Alumaweld Striker	19	85
20	Hughscraft Searunner	19	115
21	Klamath	18	60
22	Lund	18	60
23	Lund	18	90
23	Alumaweld	20	220
24	Alumaweld	24	90
25	Hughscraft	16	60
25	Riverhawk	18	60
26	Lund	16	60
26	Klamath	18	60
27	Hughscraft Sportman	20	115
28	Jet Craft	18	90
29	Lund	18	60
29	Klamath	18	60

Stephen R. Braund & Associates, 2013.

3.2 Hunting Activity Details

This section describes the offshore hunting patterns of Wainwright residents during the three boating seasons. GPS tracks obtained from participants, as well as the results of hunter discussions associated with each hunting trip, were used to summarize 2010 through 2012 offshore subsistence activities. The tables, graphs, and maps included throughout this section contain the results of this summary and provide information on the location, duration, and timing of hunting activities, the number and composition of hunting parties, and the estimated costs per trip.

The field researcher obtained 170 offshore reported trips from Wainwright participants during the 2010 season; 155 offshore reported trips from the 2011 season; and 162 offshore trips in 2012. Table 11 lists the breakdown of these trips. For 2010, 122 are hunting trips, 38 are offshore snowmachine trips to hunting areas (e.g., bowhead whaling camp), and 10 are offshore trips that do not fit into either category

(e.g., search and rescue trips, recreational trips, trips to neighboring villages to visit friends and family). Two of the 122 hunting trips from 2010 did not have associated GPS tracks; the remaining nine trips had multiple participants recording the same trip resulting in 111 unique boat tracks recorded for 2010. For 2011, 132 are hunting trips, 19 are offshore snowmachine trips to hunting areas (e.g., bowhead whaling camp), and four are offshore trips that do not fit into either category. Eleven trips had multiple participants recording the same trip resulting in 121 unique boat tracks recorded for 2011. In 2012, participants reported 137 hunting activity trips, 23 snowmachine trips to hunting areas, and two other trips. Eight trips had multiple participants recording the same trip resulting in 129 unique boat tracks recorded for 2012.

Table 11: Wainwright Trip Summary

Trip Type	2010*	2011	2012
Hunting Activity Trips (Unique Boat Tracks)	122 (111)	132 (121)	137 (129)
Other Trips (no hunting purpose)	10	4	2
Snowmachine Trip to Hunting Area	38	19	23
Total Trips	170	155	162
*Two hunting activity trips in 2010 do not have associated GPS data.			

Stephen R. Braund & Associates, 2013.

During trip summary questions in 2011, Wainwright participants reported between 59 and 64 trips without corresponding GPS tracks for the year. During trip summary questions in 2012, Wainwright participants reported completing a total of 34 trips without a GPS in 2012. Twenty-one of these trips were spring bowhead whale trips; one of these trips resulted in the participant's crew successfully harvesting a whale. Participants also did not record seven bearded seal trips and six beluga trips in 2012.

The remainder of tables for Wainwright's 2010 through 2012 offshore hunting activities are based on the hunting activity trips for each year. In some instances, participants did not provide or could not remember the answer to each question asked of them and thus the total number of trips for each data table may be less than the totals stated above. For example, Table 27 lists wind direction for 108 trips in 2010. In this case, participants did not provide a wind direction for the other 14 hunting activity trips. As discussed above in the methods, the maps show the unique boat tracks (i.e., duplicate tracks removed from trips with multiple participants recording the same track) that represent the hunting activity trips.

3.2.1 Location of Hunting Activities

Map 2 through Map 4 show all tracks and waypoints provided by Wainwright participants for the 2010, 2011, and 2012 field seasons (February through October). Although the majority of tracks for all three years (111 in 2010; 121 in 2011; and 129 in 2012) are associated with offshore hunting activities, the map also includes snowmachine tracks associated with breaking trail or traveling to and from whaling camp, as well as a small number of tracks associated with other offshore activities such as search and rescue trips. The 2010 GPS tracks extend along the Chukchi Sea coast from Kasegaluk Lagoon at Akoliakatat Pass north to Barrow, and offshore from Wainwright approximately 37 miles. The 2011 and 2012 GPS tracks extend north to Peard Bay and south to Kasegaluk Lagoon at Icy Cape Pass. Participants traveled farther offshore more frequently in 2011 than they did in 2010 and 2012, but limited their distance from the shore to approximately 30 miles in all study years. Possible reasons for this are discussed in Sections 3.4, 3.5, and 3.6 which discuss participants' observations regarding the overall season and factors that influenced subsistence activities during each study year.

Map 2: All Tracks and All Waypoints, Wainwright 2010 (March-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

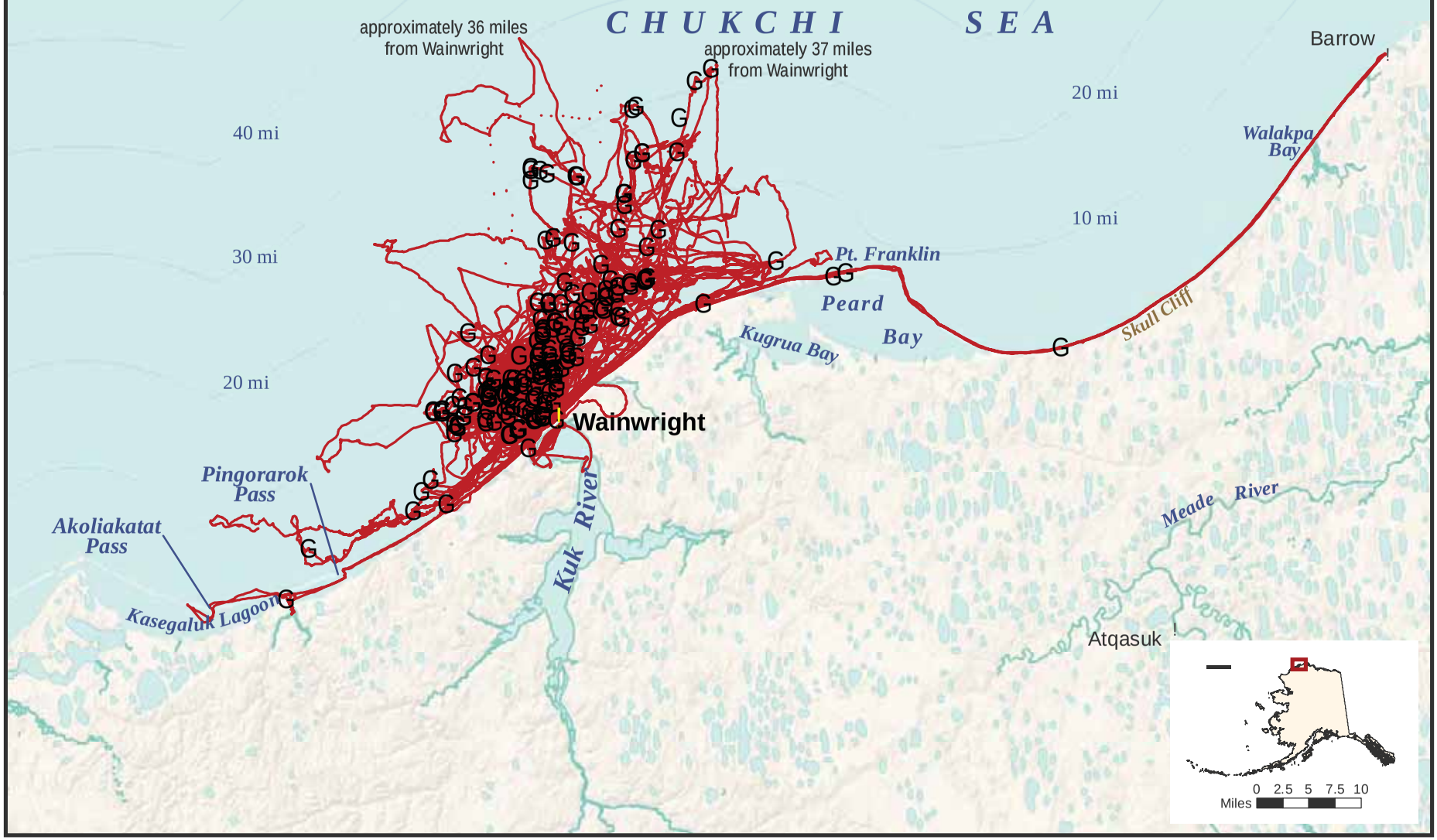
! study community

! other community

G all waypoints including strike/harvest sites and other observations (180 points, 16 respondents) G

all tracks including hunting, snowmachine and other tracks (159 tracks, 16 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 3: All Tracks and All Waypoints, Wainwright 2011 (February-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

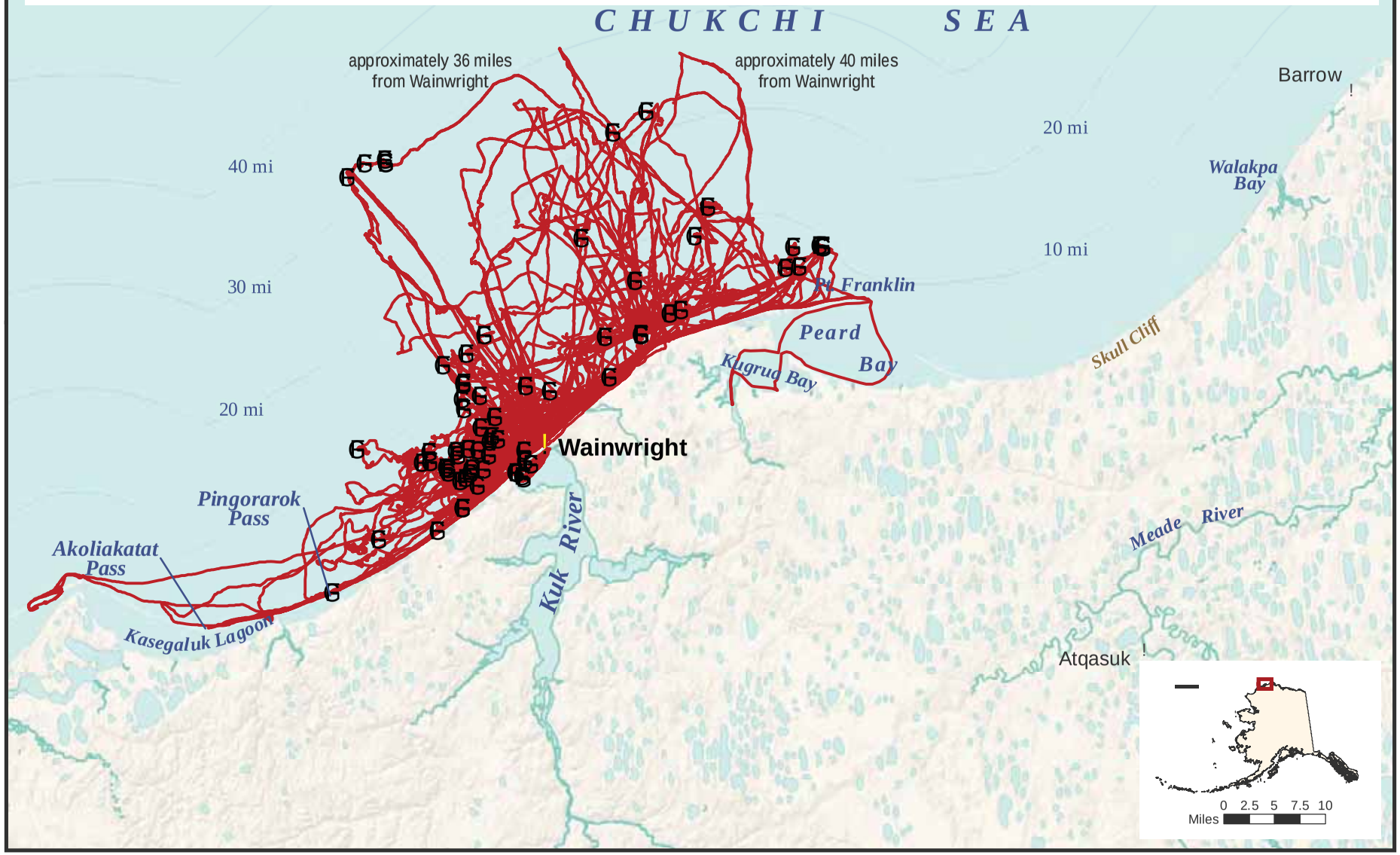
! study community

! other community

all waypoints including strike/harvest sites and other observations (69 points, 16 respondents)

all tracks including hunting, snowmachine and other tracks (144 tracks, 22 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 4: All Tracks and All Waypoints, Wainwright 2012 (April-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

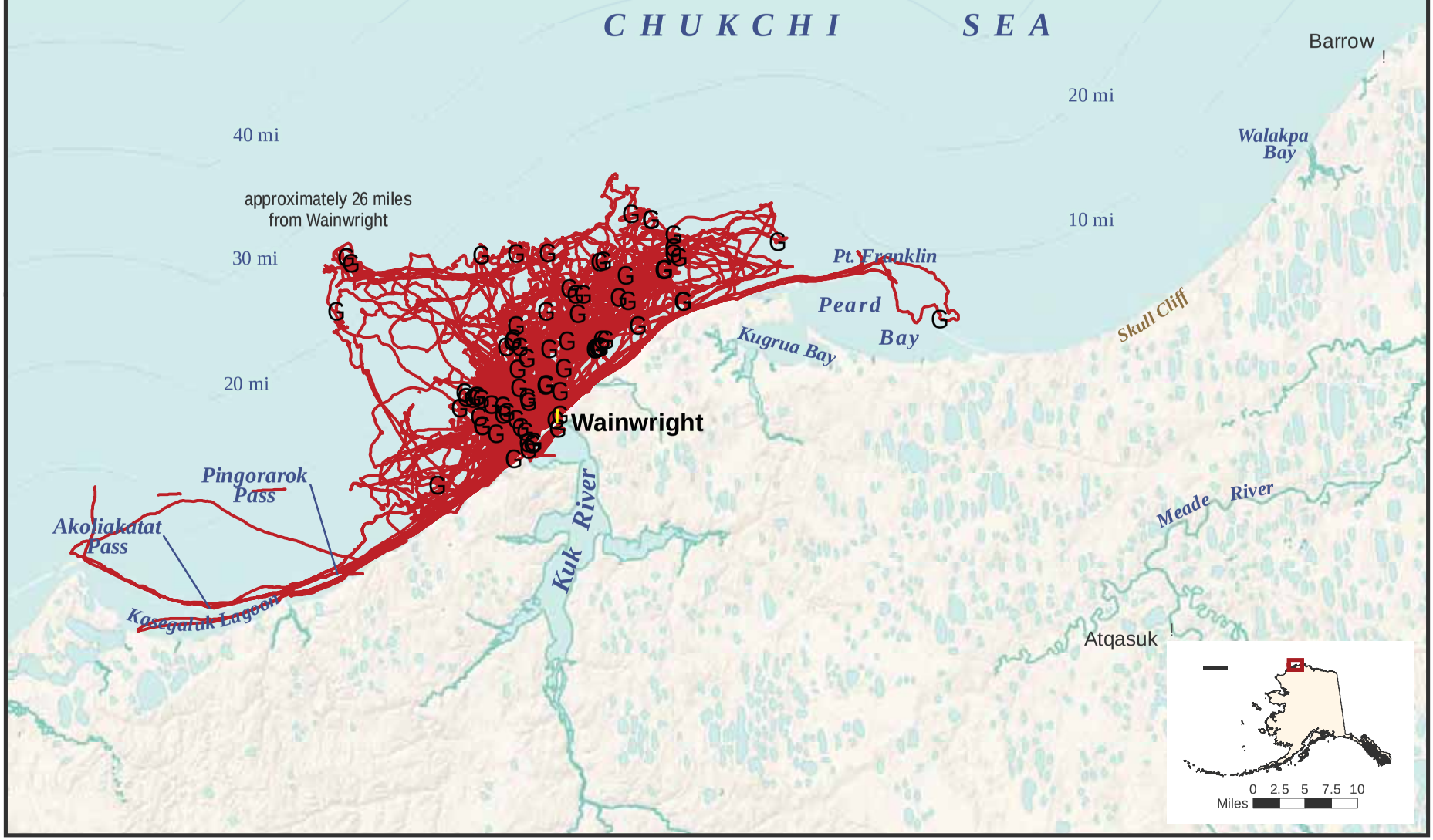
! study community

! other community

all waypoints including strike/harvest sites and other observations (82 points, 13 respondents)

all tracks including hunting, snowmachine and other tracks (154 tracks, 16 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



The maps also show the location of waypoints collected by hunters in the field or added during the downloading of the data. Waypoints typically mark harvest locations or animal sightings, but may indicate anything the participant thought was noteworthy, such as whaling camps and coastal cabin sites, trails to whaling camps, and prominent coastal landmarks. The majority of waypoints are located north and west of Wainwright at a distance of no more than 15 miles on both maps. Wainwright participants marked few waypoints for their harvest and wildlife sightings in the three study years. It became apparent that the participants did not mark all of the waypoints for harvest and wildlife sightings, and thus the waypoint data in this report do not reflect the total harvests or wildlife sightings in the Wainwright area. Community members confirmed during the November 2013 community review meetings that the low number of waypoints reflects the difficulty and inconvenience participants reported with recording waypoints at the time an animal is harvested.

Wainwright hunting tracks (not including snowmachine tracks to hunting areas or non-hunting tracks) for all resources in 2010, 2011, and 2012 are depicted on Map 5, Map 6, and Map 7. Wainwright hunting tracks from 2010 extend from Kasegaluk Lagoon at Akoliakatat Pass north to Pt. Franklin at a distance of up to 37 miles from Wainwright. The farthest distance offshore that residents traveled in 2010 was just over 30 miles during spring bowhead whaling. Hunting tracks from 2011 show that participants traveled slightly farther from Wainwright compared to 2010, with tracks extending north to Point Franklin and into Peard Bay, and south to Kasegaluk Lagoon at Icy Cape Pass, with a maximum distance from Wainwright of approximately 40 miles. Similar to 2010, the farthest distance offshore that Wainwright participants recorded traveling was during bowhead whaling; however, in 2011 the farthest distance was reported during fall bowhead whaling at a distance of approximately 32 miles offshore.

Hunting activity trips from 2012 were similar to previous years except 2012 tracks do not extend as far offshore as they did in 2010 and 2011. This difference can be attributed to the fact that Wainwright residents did not participate in whaling activities in 2012 (see “Bowhead Whale Hunting Tracks” discussion) which were primarily the farthest offshore hunting activities that occurred in 2010 and 2011. The farthest distance offshore reported in 2012 was approximately 26 miles and recorded during a walrus hunting trip. In a few cases, participants reported that subsistence was not the main purpose of a trip. These trips were included if the participant indicated that subsistence-related activities (e.g., scouting for animals, opportunistic harvests) occurred during the trip.

Tracks displayed on Map 5 through Map 7 indicate concentrated offshore subsistence hunting activities were located closest to the community and generally trended northeast.Map 8 through Map 10 show snowmachine tracks to hunting areas and boat tracks not associated with hunting in 2010, 2011, and 2012. Snowmachine tracks are associated with breaking trail or traveling to and from whaling camps. Boating trips not associated with hunting include a trip to Barrow and several trips where the study team was unable to ascertain the purpose of the trip. For instance, one participant reported that the tracks on their GPS belonged to the participant’s son who took the boat and GPS out for an offshore trip.

The following sections describe the locations of Wainwright participants’ hunting activities by subsistence resource, season, ocean ice conditions, and duration of trip. These sections only include information associated with offshore hunting activity trips and do not include information associated with snowmachine trips or non-hunting tracks.

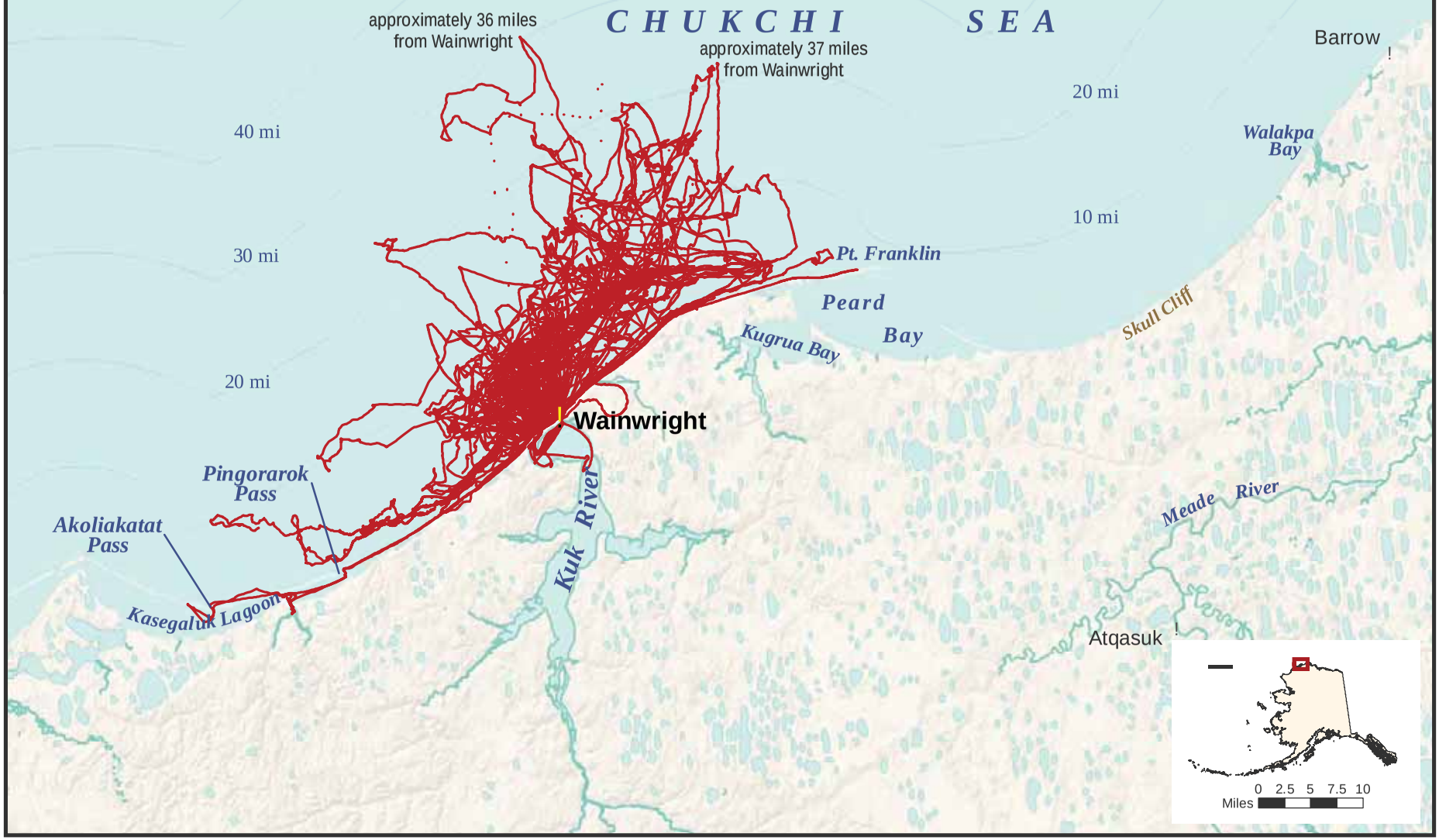
Map 5: Hunting Tracks, Wainwright 2010 (March-July, September and October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

hunting tracks
(111 boat tracks representing 120 hunting trips, 16 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 6: Hunting Tracks, Wainwright 2011 (April-October)

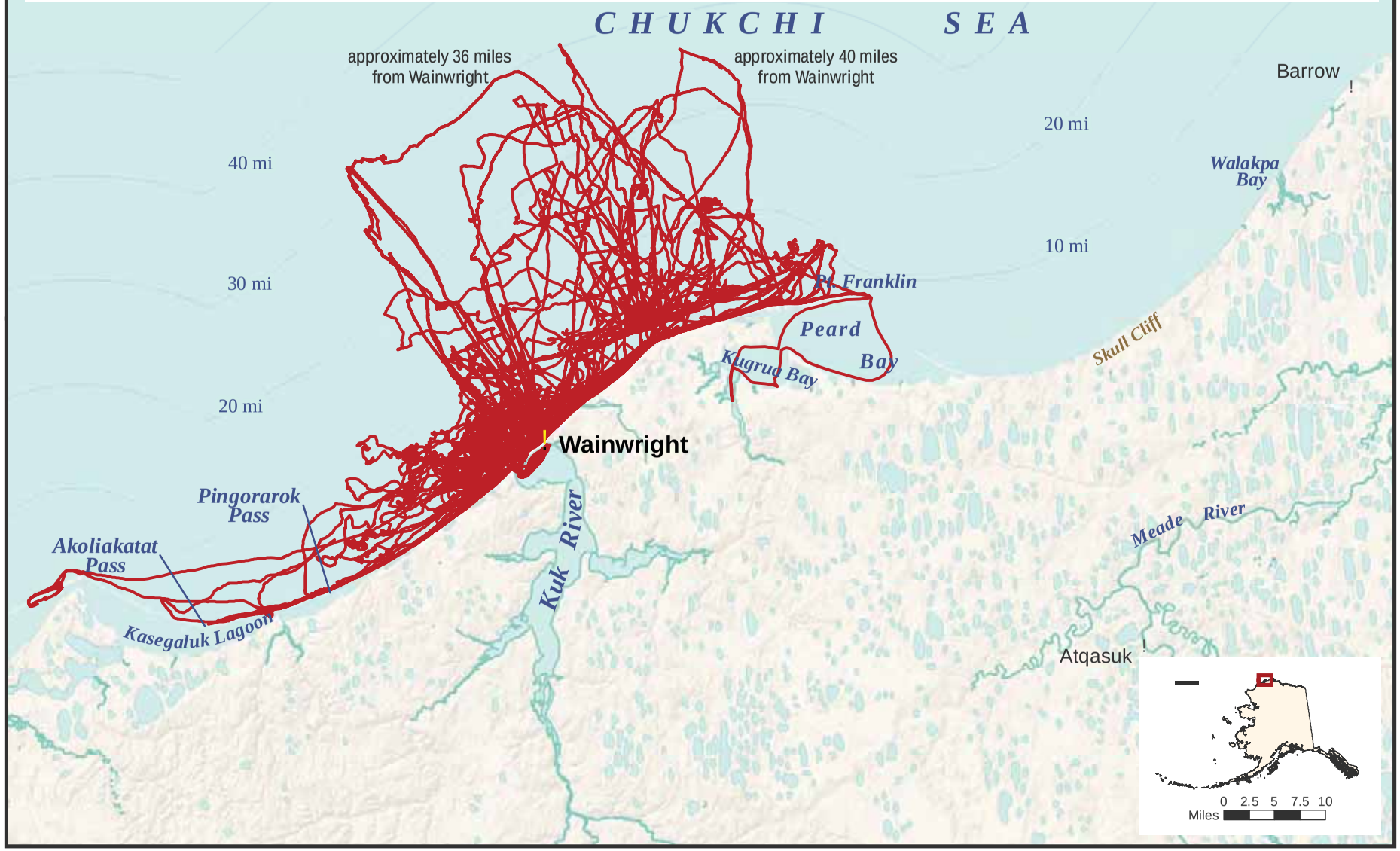
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

hunting tracks
(121 boat tracks representing 132 hunting trips, 22 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 7: Hunting Tracks, Wainwright 2012 (April-September)

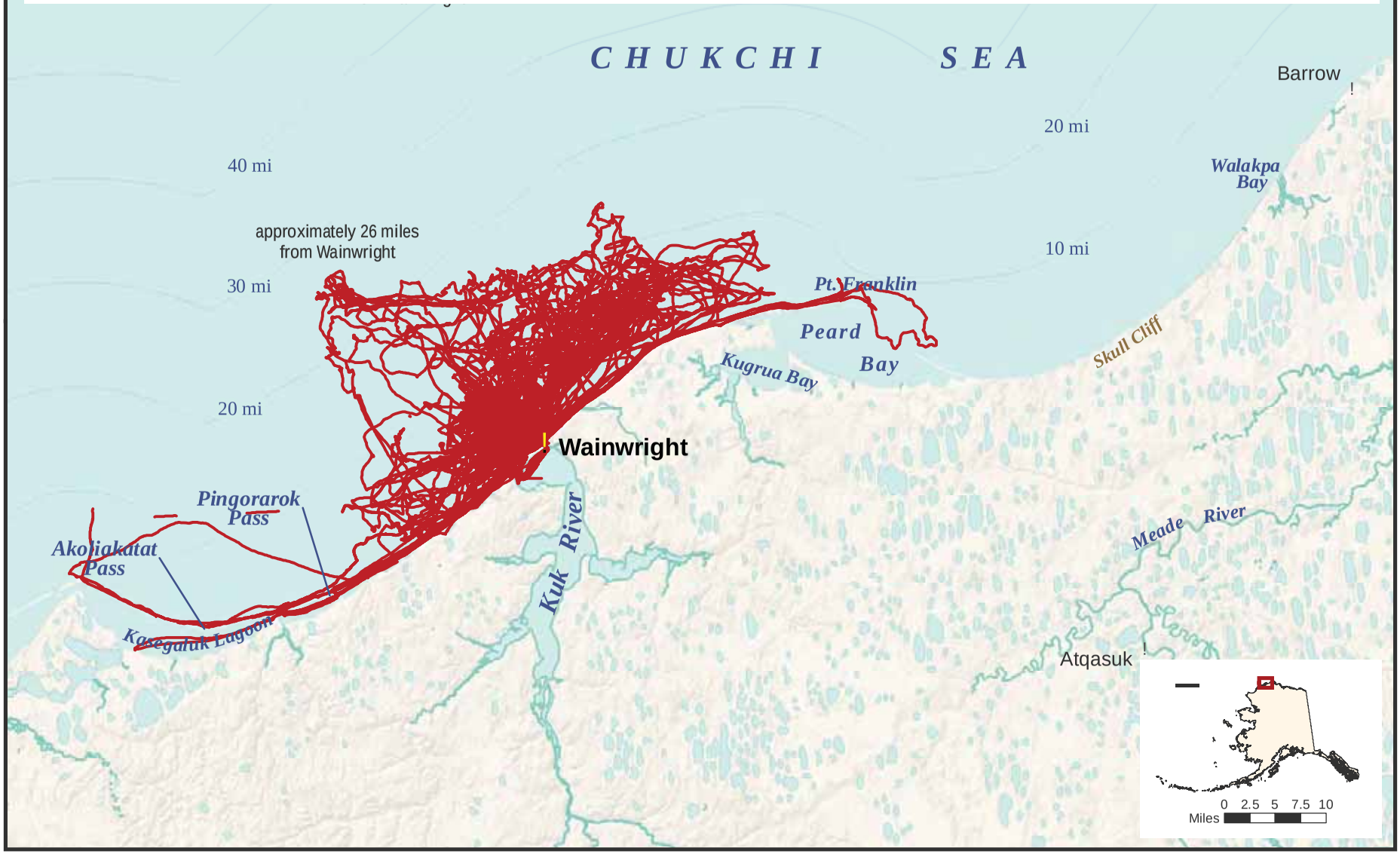
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

hunting tracks
(129 boat tracks representing 137 hunting trips, 16 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 8: Wainwright 2010, Snowmachine Tracks (March-May) and Other Tracks (May-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

snowmachine tracks (38 tracks, 9 respondents)

other tracks (10 tracks, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 9: Wainwright 2011, Snowmachine Tracks (February-May) and Other Tracks (June-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

snowmachine tracks (19 tracks, 5 respondents)

other tracks (4 tracks, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 10: Wainwright 2012, Snowmachine Tracks (March-June) and Other Tracks (June)

Stephen R. Braund & Associates
P.O. Box 1480
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(907) 276-8222 srba@alaska.net

! study community

! other community

snowmachine tracks (23 tracks, 6 respondents)

other tracks (2 tracks, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

3.2.1.1 Seal Hunting Tracks

Map 11 through Map 13 show seal hunting tracks and harvest/strike waypoints for the three study years. The number of seal hunting tracks ranged from 52 in 2011 to 77 in 2012; the number of participants who provided seal hunting tracks ranged from 13 in 2010 to 18 in 2011. Participants identified the majority of seal hunting tracks for bearded seal, although ringed and spotted seals were also targeted on a few trips. In 2010, seal hunting activities occurred during March, April, June, and July. In 2011 and 2012, the months of seal hunting activity was reported from May/June to September. Participants indicated that seal hunting is less prevalent in spring months (e.g., March and April) due to the large amount of ice that is present and that the majority of seal hunting occurs later in the summer during June and July when there is more open water. Residents reported that 2010 was a difficult year for hunters due to persistent high winds and low wildlife abundance, and these factors may have contributed to the absence of late summer (e.g., August and September) sealing tracks in 2010.

During the three study years, participants reported hunting seals from Icy Cape Pass in the south to Point Franklin, Peard Bay, and Kugrua Bay in the north. Wainwright participants traveled as far as 37 miles offshore from Wainwright (just over 20 miles directly from shore) in search of seals. In other years, the farthest offshore extent of seal hunting tracks were documented at 26 miles (2012) and 12 miles (2011). The highest concentrations of seal hunting tracks during all three study years are located within 10 miles of Wainwright along the coast. A greater number of tracks in 2012 extended beyond 10 miles offshore than in previous years.

3.2.1.2 Bowhead Whale Hunting Tracks

Map 14 through Map 16 show spring bowhead whaling tracks, strike/harvest waypoints, and associated snowmachine tracks on the shorefast ice to whaling camps for 2010, 2011, and 2012 respectively. On the 2010 map, snowmachine trails run parallel to the coastline from a point approximately 15 miles southwest of Wainwright to a point approximately 20 miles northeast of the community. Whaling camps, represented by brown squares, occur along the main snowmachine trail southwest of the community. Northeast of the community, three snowmachine trails extend to whaling camps and a lead approximately five miles offshore. On the 2011 map, almost all snowmachine trails extend north of the community along the coast to one of several points located approximately 15 miles northeast of the community. The main whaling camp was recorded near a lead at the terminus of one of these points. The snowmachine trails to whaling camps in 2012 are located southwest and northeast of the community with the greatest concentration to the northeast similar to the previous study years. Several whaling camps were recorded by participants in 2012, each one located several miles offshore to the northeast of the Wainwright.

For the three study years, the number of participants reporting spring whaling tracks ranged from five in 2011 to seven in 2010 and 2012 and the number of tracks ranged from 15 to 39. The smaller number of tracks and waypoints on the 2011 map (Map 15) are not an accurate representation of the community's bowhead hunting activities for the spring whaling season because a large number of participants reported that they either forgot to bring their GPS or failed to turn it on during trips. For all study years, bowhead whaling tracks fan out from Wainwright in all offshore directions but are concentrated north and east of the community. In 2011 and 2012, spring whaling tracks were more concentrated and located closer to shore (up to 22 and 12 miles respectively) whereas 2010 tracks were generally more dispersed and extended farther offshore. The farthest distance offshore that residents traveled in 2010 was just over 30 miles and associated with a spring bowhead whaling trip in which the participant was searching for a bowhead that had been struck in the fog closer to shore.

Map 11: Seal Hunting Tracks, Wainwright 2010 (March, April, June, July)

Stephen R. Braund & Associates
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(907) 276-8222 srba@alaska.net

bearded, ringed, spotted, and unspecified seal hunting tracks
(57 boat tracks representing 64 hunting activity trips, 13 respondents)

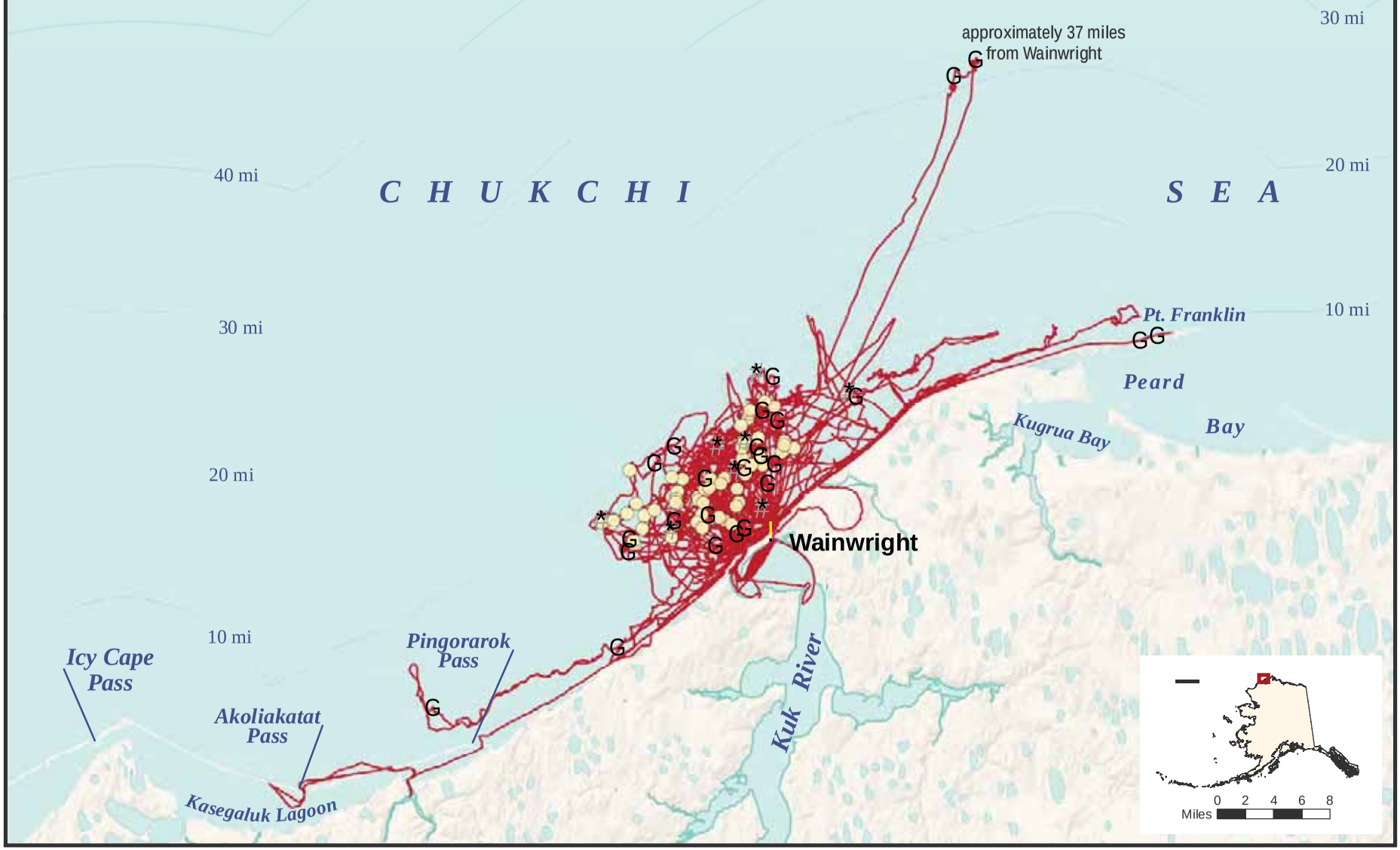
! study community

G seal harvest sites (25 points, 10 respondents)

* seal strike sites (8 points, 7 respondents)

(seal sightings

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 12: Seal Hunting Tracks, Wainwright 2011 (June-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

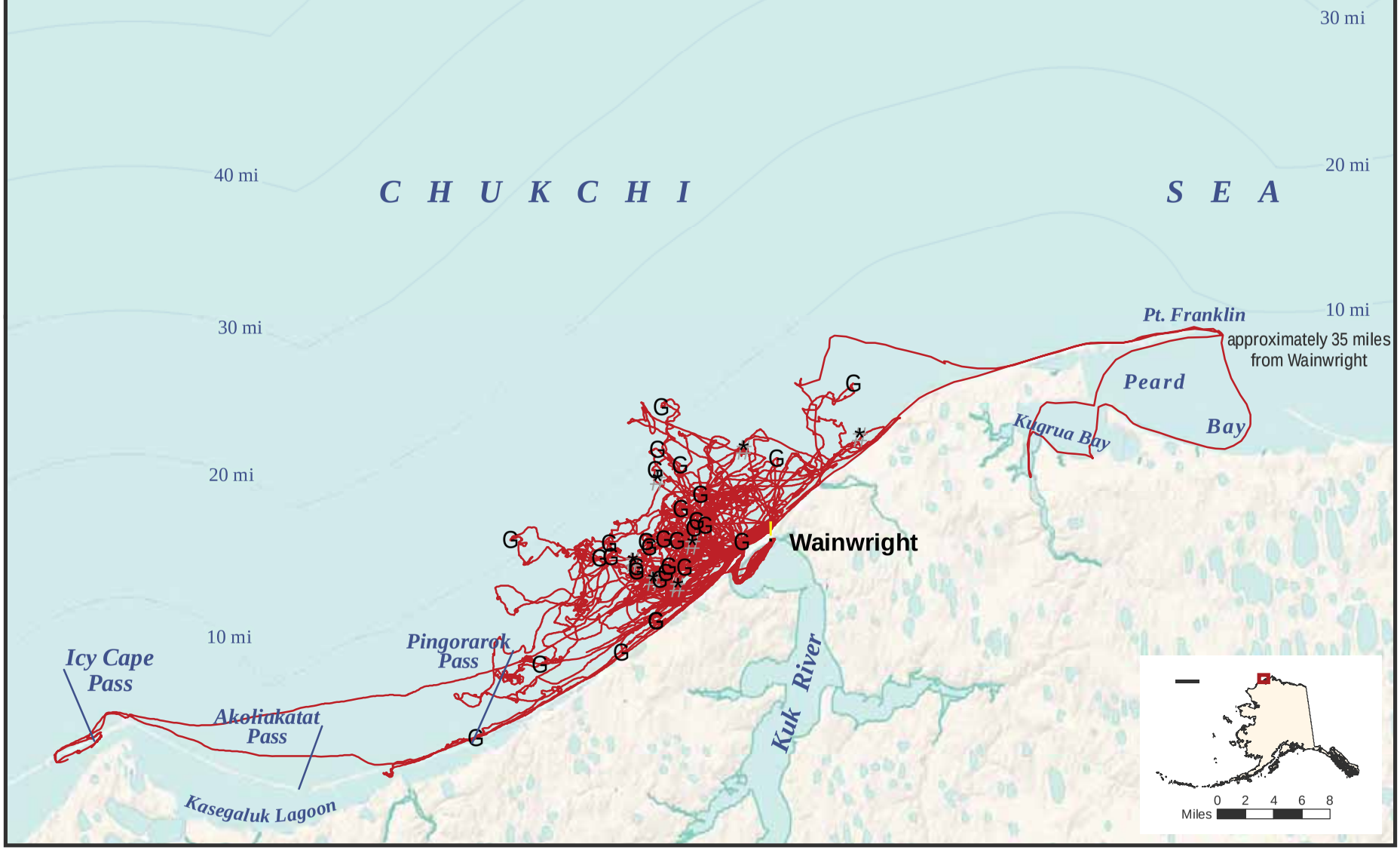
bearded, ringed, and spotted seal hunting tracks
(52 boat tracks representing 57 hunting activity trips, 18 respondents)

! study community

G seal harvest sites (31 points, 10 respondents)

* # seal strike sites (7 points, 5 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 13: Seal Hunting Tracks, Wainwright 2012 (May-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

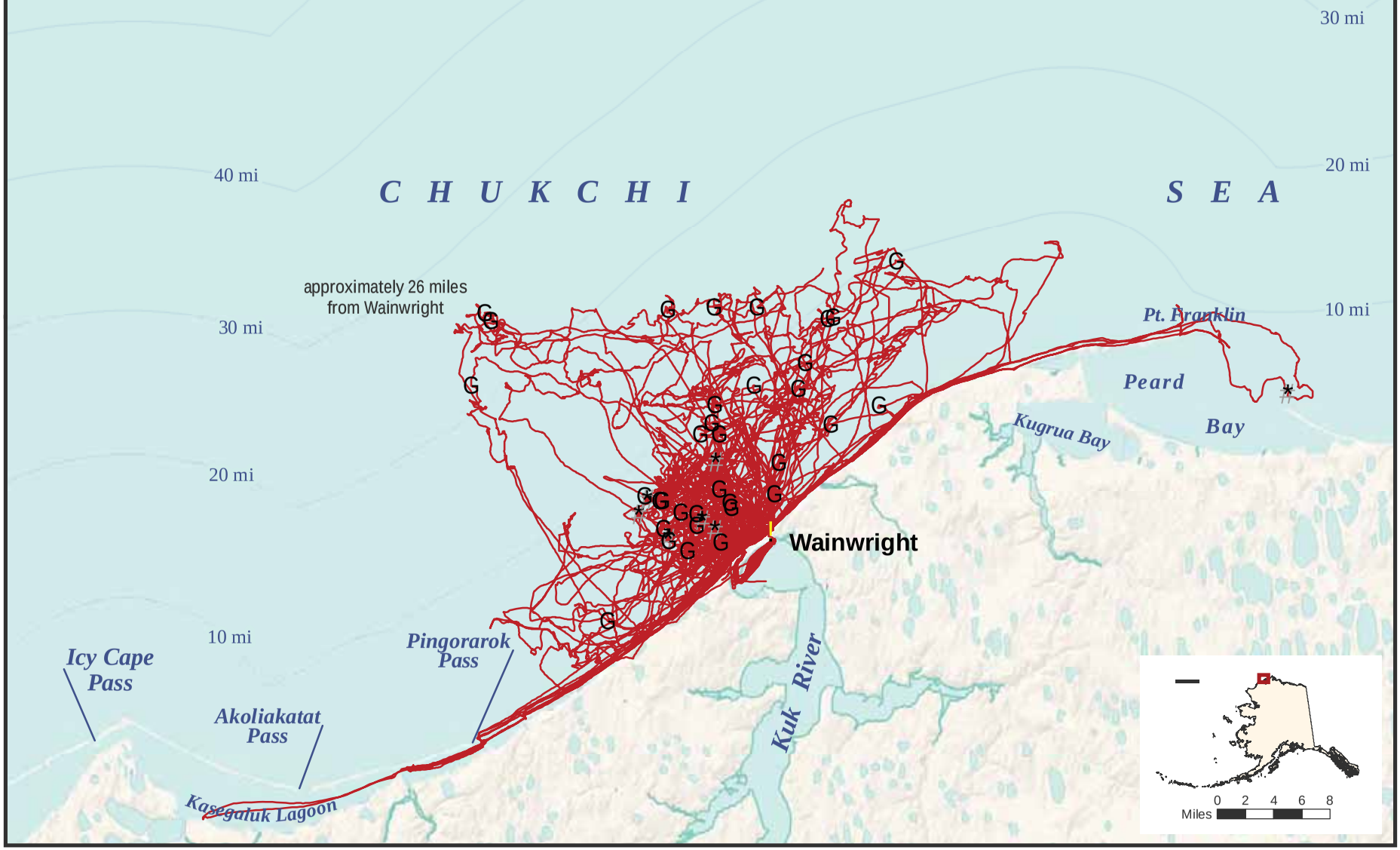
bearded, ringed, spotted, and unspecified seal hunting tracks
(77 boat tracks representing 80 hunting activity trips, 14 respondents)

! study community

G seal harvest sites (34 points, 11 respondents)

* # seal strike sites (7 points, 3 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 14: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Wainwright 2010 (April-June)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

snowmachine tracks (13 tracks, 4 respondents)

bowhead whaling tracks (39 boat tracks representing 40 hunting trips, 7 respondents)

G bowhead harvest site (1 point, 1 respondent)

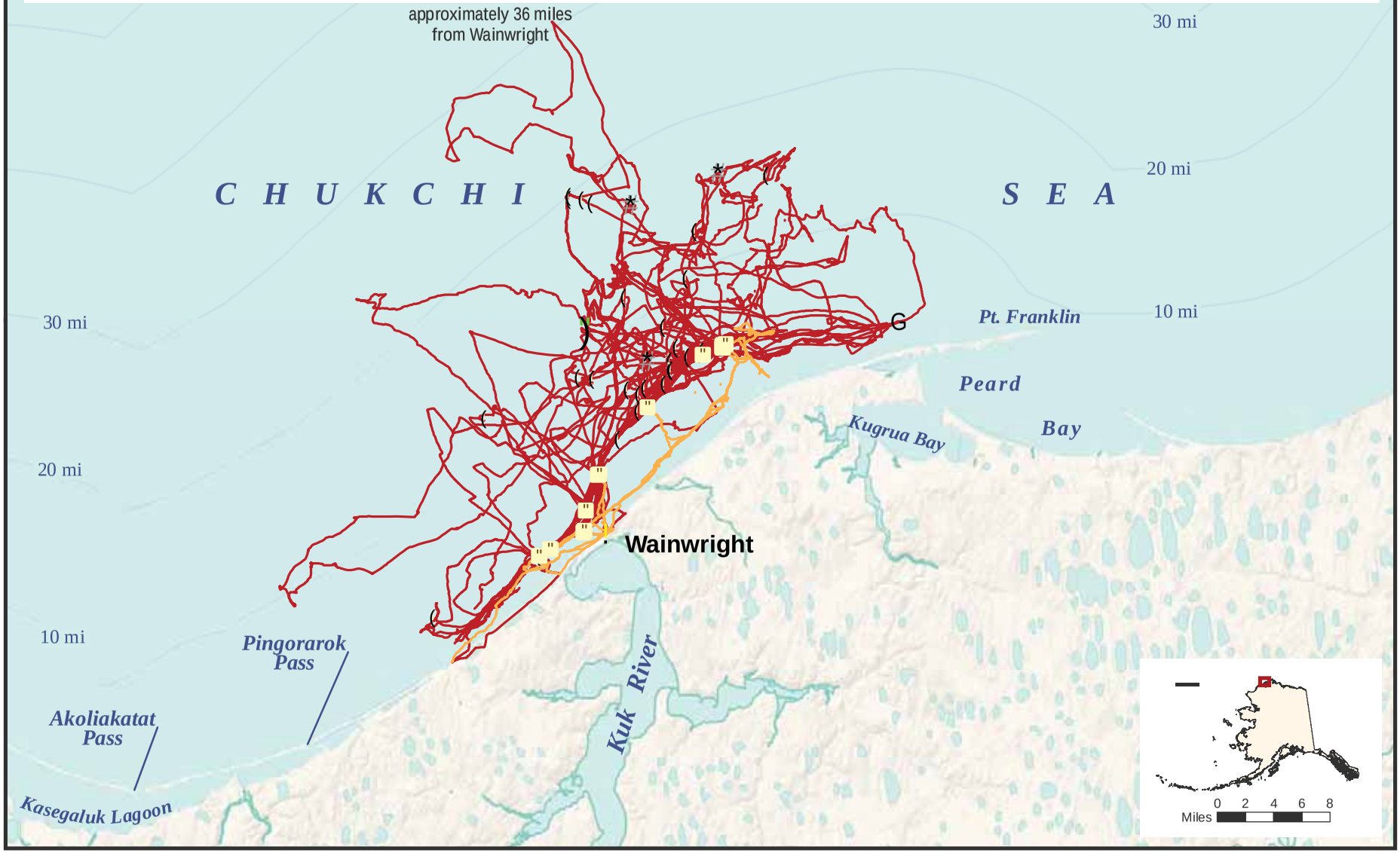
* bowhead strike sites (3 points, 2 respondents)

" whaling camp

(bowhead sightings

) bowhead harvest site (1 point, 1 respondent, 2013 community review meeting)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 15: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Wainwright 2011 (February-May)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

snowmachine tracks (19 tracks, 5 respondents)

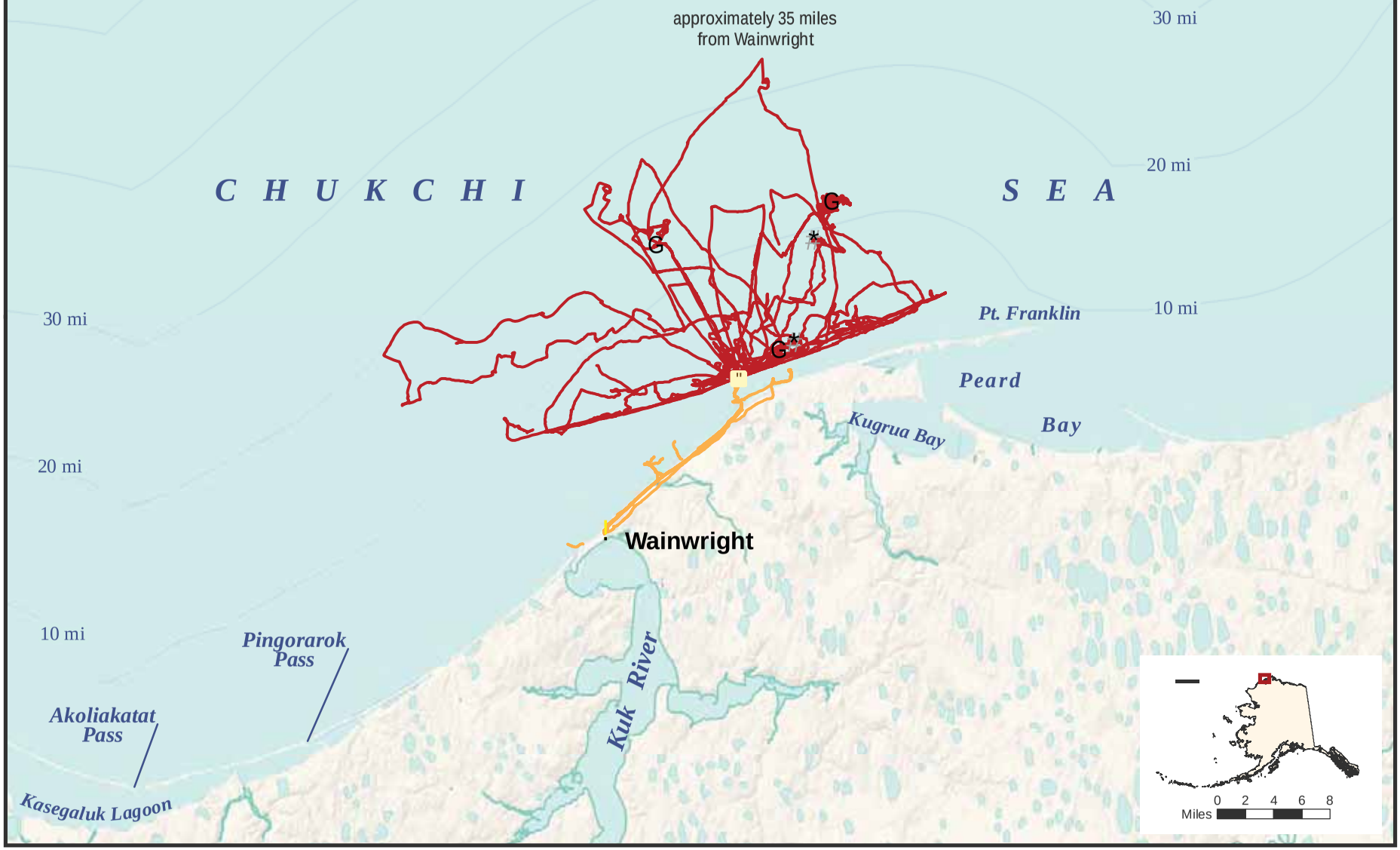
bowhead whaling tracks (15 boat tracks representing 15 hunting trips, 5 respondents)

G bowhead harvest sites (3 points, 3 respondents)

* bowhead strike sites (2 points, 2 respondents)

" whaling camp

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 16: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Wainwright 2012 (April-May)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

snowmachine tracks (23 tracks, 6 respondents)

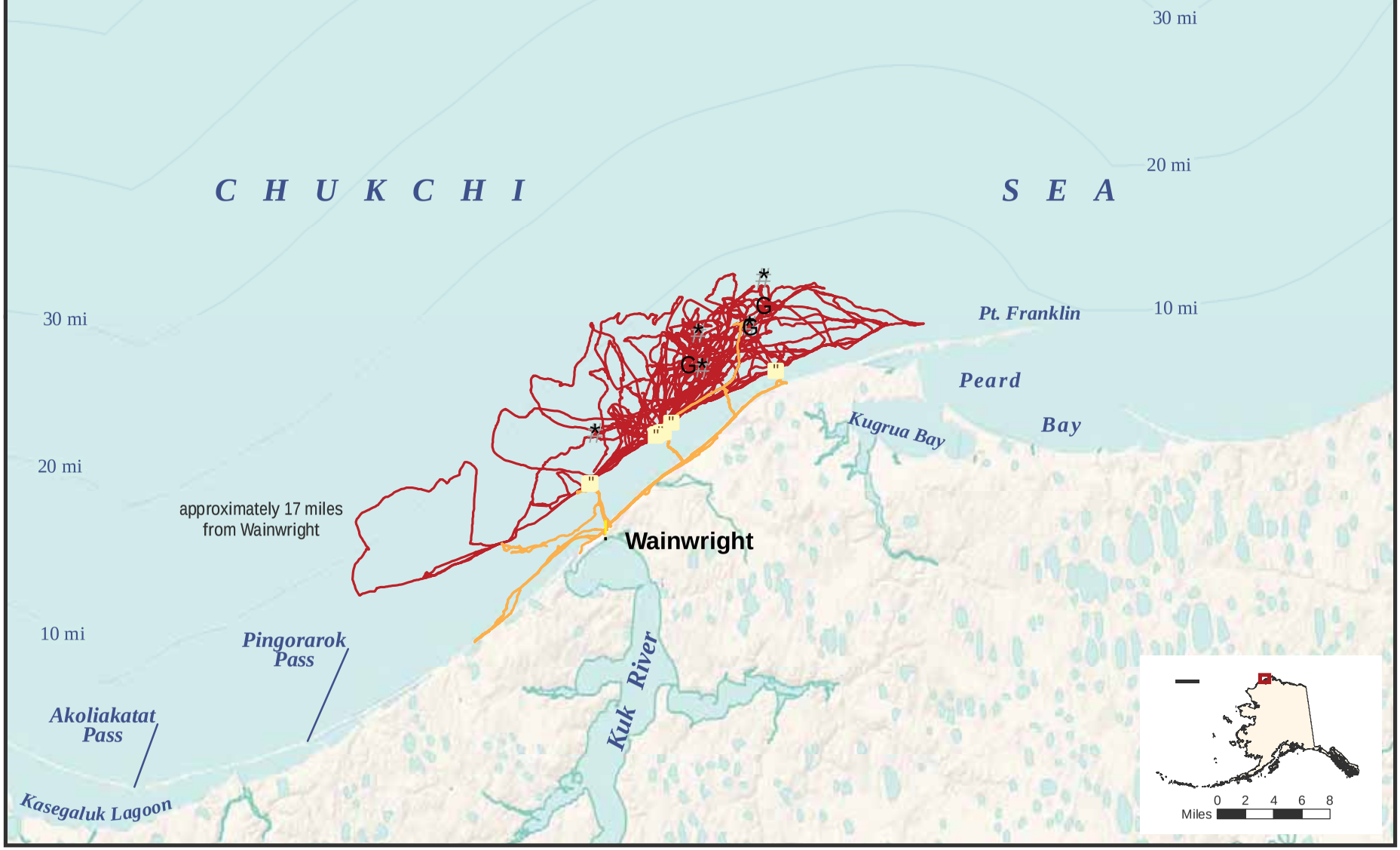
bowhead whaling tracks (29 boat tracks representing 34 hunting trips, 7 respondents)

G bowhead harvest sites (3 points, 3 respondents)

* bowhead strike sites (5 points, 3 respondents)

" whaling camp

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



During the January 2012 community review meeting, one meeting attendee provided a TK observation that the community's spring whaling locations are highly dependent on the ice conditions, can change greatly from year to year, and were not fully captured during the 2010 and 2011 study years. This person described one season in which the community had to conduct spring whaling near Point Franklin and another season when the community had to hunt near Icy Cape due to variable ice conditions:

> *I think that the spring right before spring whaling we had to go farther up toward Barrow toward Point Franklin. We had to look for ideal conditions to launch the boats. … I think we should make recordings of the ice conditions for each year. When it doesn't open up in front of Wainwright....when we don't have the opening closer to Wainwright, we have to go to Icy Cape. One year we had to do that.* (Wainwright Community Review Meeting January 2012)

For the three study years, residents did not report having to use the Point Franklin or Icy Cape areas for spring bowhead whaling and this individual's observation points to the variability that can occur each year for spring bowhead whaling and the limitations of shorter time series of data in characterizing a community's offshore subsistence activities.

Map 17 and Map 18 show fall bowhead whaling tracks and harvest/strike waypoints for the 2010 and 2011 study years. Wainwright successfully harvested its first fall bowhead whale in approximately 70 years in 2010 and also successfully harvested a fall bowhead whale in 2011. Six Wainwright participants provided eight tracks in 2010, and 10 participants provided 25 tracks in 2011. All tracks from 2010 are located northeast of the community with the farthest extending approximately 37 miles northeast of Wainwright (just over 20 miles from shore). The community's 2010 fall bowhead harvest occurred northeast of the community approximately 20 miles from shore. The 2011 tracks cover a much larger area that extends northeast and northwest of the community just over 30 miles offshore (approximately 40miles from Wainwright); The location of the community's fall bowhead whale harvest was northwest of the community approximately 30 miles offshore. The larger number of tracks in 2011 is due to the larger number of participants who brought their GPS with them while boating and turned it on. The farthest distance offshore that Wainwright participants recorded traveling in 2011 was during the fall bowhead whaling with the farthest track reported approximately 32 miles offshore. In 2012, Wainwright chose not to try for a fall bowhead whale hunt. High winds and swells in September made conditions too dangerous for fall whaling. In addition, Wainwright had a successful spring hunt (and a successful year in general for marine mammal harvests) and only had one strike left for the 2012 whaling season. The community chose to give this strike away to another community. In total, Wainwright landed three bowheads in 2010, three in 2011, and four in 2012 (Suydam et al. 2012, 2011, and 2010).

3.2.1.3 Walrus Hunting Tracks

Walrus hunting tracks and harvest/strike waypoints from 2010 through 2012 are shown on Map 19 through Map 21. Map 19 contains five walrus hunting tracks reported by five participants. GPS tracks indicate that participants hunted walruses along the coast between a point a few miles south of the mouth of the Kuk River north to a point 10 miles west of Point Franklin. All reported walrus hunting trips in 2010 took place during June, July, and September. Participants prefer to harvest walruses in locations where sea ice is present because sea ice provides habitat for the walruses and makes it easier for participants to harvest them. Residents indicated that 2010 was a poor year for walrus hunting due to the lack of sea ice.

In contrast to the poor conditions for Wainwright's walrus hunting in 2010, project participants indicated that 2011 and 2012 were better years in terms of the community's walrus hunting activities. Map 20 and Map 21 shows a notable increase in walrus hunting tracks (25 and 24 tracks) and participants (12 individuals). In 2011, participants hunted for walruses no farther than 10 miles from the coast, traveling as far north as Point Franklin and as far south as Ice Cape. As sea ice lingered at Point Franklin longer

Map 17: Bowhead Whaling Tracks, Wainwright 2010 (October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

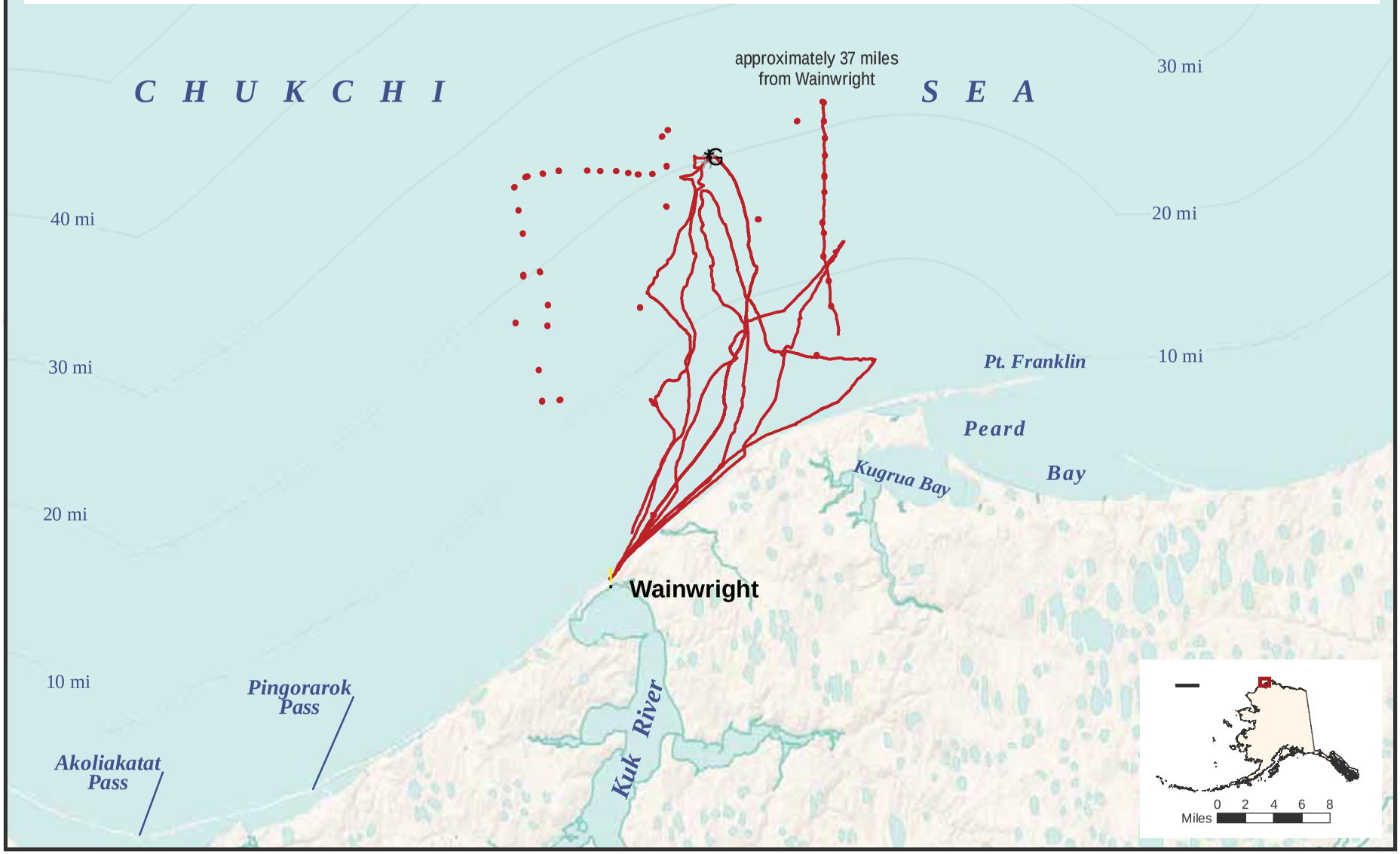
bowhead whaling tracks
(8 boat tracks representing 9 hunting trips, 6 respondents)

G bowhead harvest site (1 point, 1 respondent)

bowhead strike site (1 point, 1 respondent)

Red dots represent a track that recorded one respondent's location at intermittent intervals.

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 18: Bowhead Whaling Tracks, Wainwright 2011 (September-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

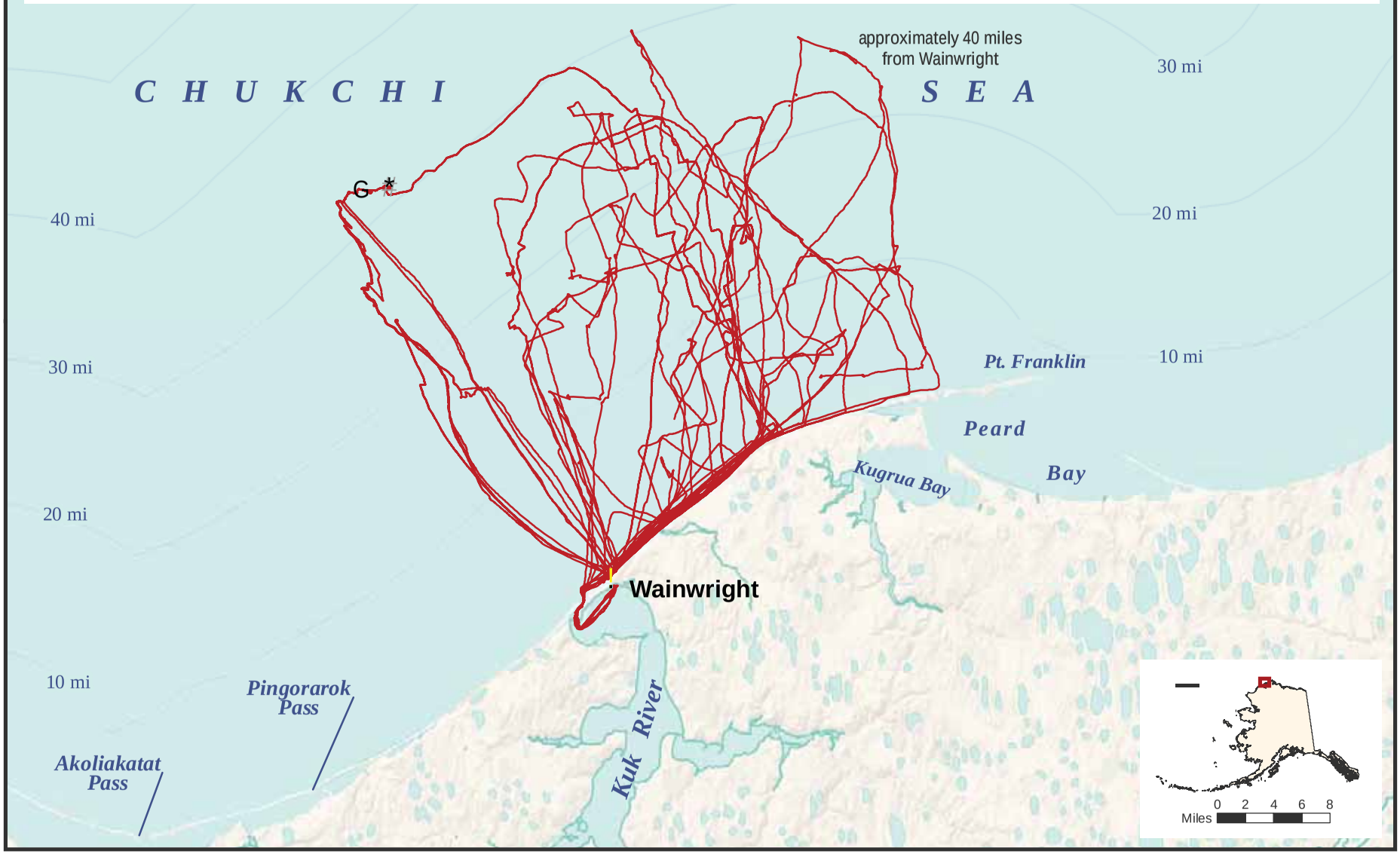
! study community

bowhead whaling tracks
(25 boat tracks representing 31 hunting trips, 10 respondents)

G bowhead harvest site (1 point, 1 respondent)

bowhead strike site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 19: Walrus Hunting Tracks, Wainwright 2010 (June, July, and September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

walrus hunting tracks (5 boat tracks representing 5 hunting trips, 5 respondents)

! study community

G walrus harvest sites (3 points, 3 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 20: Walrus Hunting Tracks, Wainwright 2011 (June-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

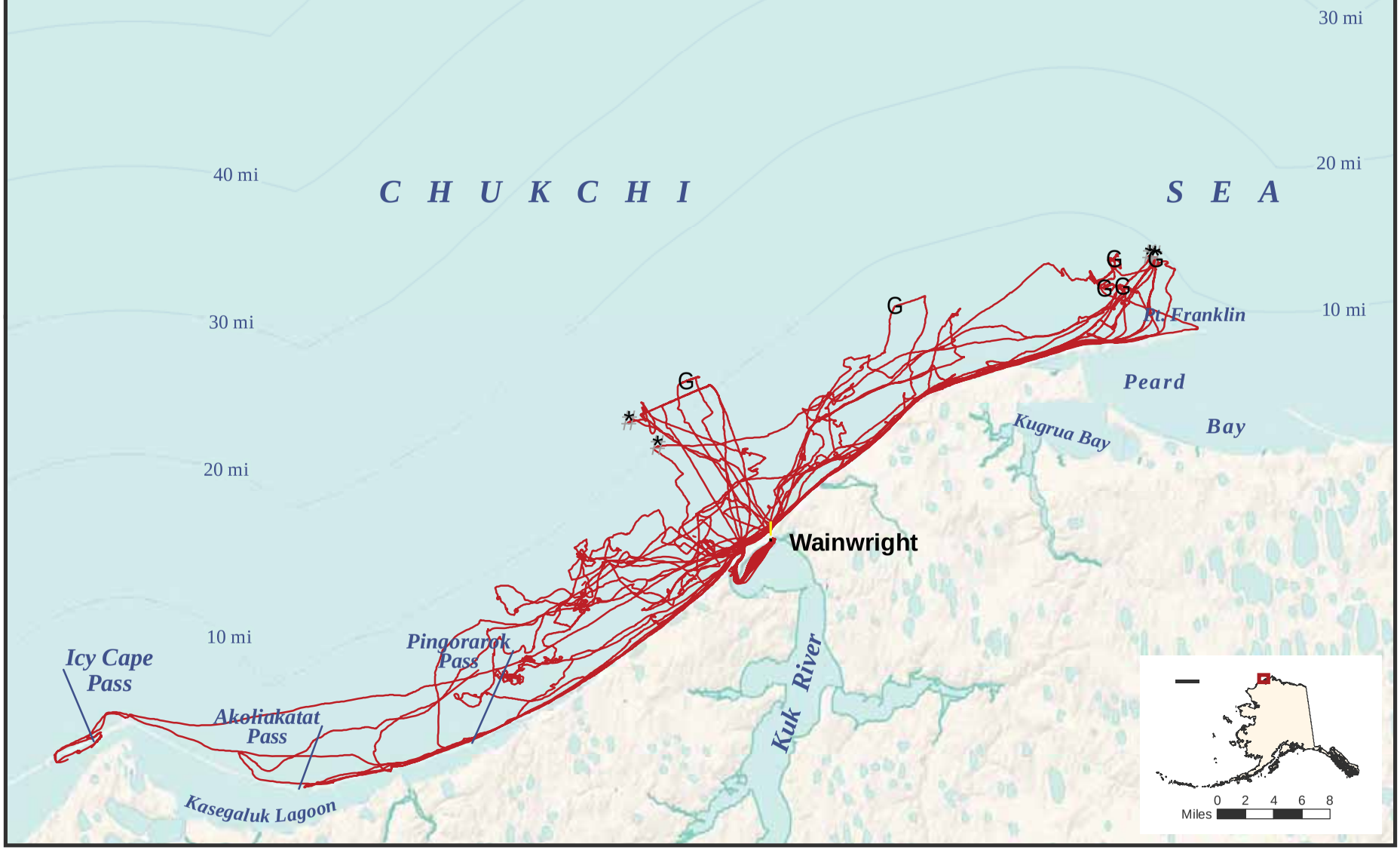
walrus hunting tracks (25 boat tracks representing 25 hunting trips, 12 respondents)

! study community

G walrus harvest sites (6 points, 5 respondents)

walrus strike sites (4 points, 4 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 21: Walrus Hunting Tracks, Wainwright 2012 (June-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

walrus hunting tracks (24 boat tracks representing 24 hunting trips, 12 respondents)

! study community

G walrus harvest sites (8 points, 6 respondents)

* walrus strike sites (2 points, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

than it did in other places in 2011, participants frequently traveled there to harvest walruses. Despite reports that 2011 was still a difficult season for walrus hunting, sea ice conditions were more favorable for walrus harvests in 2011 than in 2010 and participants successfully harvested more walruses in 2011 than they did in 2010 (see "Participant Harvests" for more details). A separate study conducted by the U.S. Fish and Wildlife Service (2012), which records the number of harvested walrus by Alaska Native subsistence hunters, confirmed resident's observations that 2011 was a better year than 2010 with walrus harvests increasing from eight to 16 walrus. In 2012, Wainwright harvesters concentrated the majority of their walrus hunting activity north and east of the community with some hunting tracks extending farther than 20 miles offshore. The farthest distance offshore reported for all offshore hunting activity trips in 2012 was approximately 26 miles and recorded during a walrus hunting trip.

3.2.1.4 Beluga Hunting Tracks

Beluga harvests by the community of Wainwright can vary widely from year to year; beluga harvest data for Wainwright from 1987-2006 show nine years of zero reported harvests and other study years where the community reported harvests of 47, 38, and 37 beluga (Frost and Suydam 2007). Beluga hunting activity is thus highly variable as well. In general, when belugas are present near the community in the summer months, Wainwright residents will hold a communal beluga hunt. One project participant described the communal beluga hunt and the importance of beluga in the sharing network in Wainwright saying,

> *By the time all the meat was cut up and passed out, I was left with a six by six piece. Just enough to make one pot. See, the beluga hunt is a community hunt. We give our meat out to the whole community, and I get the last of it. It's a community event.* (Wainwright Participant July 2012)

Map 22 through Map 24 show the location of beluga hunting tracks and harvest waypoints for each study year. Most of the beluga hunting conducted by the community occurs at the entrance to Wainwright Inlet because the shallow waters allow for easier herding and retrieval of the shot belugas. Beluga hunting tracks were also reported south towards Kasegaluk Lagoon and Icy Cape in 2010 and 2012. During the three study years, all beluga hunting occurred during the month of July. The number of participants reporting tracks ranged from two in 2010 to seven in 2012.

3.2.1.5 Caribou Hunting Tracks

The majority of Wainwright caribou hunting occurs inland along the rivers with some coastal hunting in the summer. Caribou hunting along the coast usually occurs as people are traveling to and up other river systems (SRB&A and ISER 1993a). Map 25 through Map 27 show where participants traveled offshore while hunting caribou from the coast. In total, participants recorded three coastal caribou hunting tracks and several harvest waypoints in each of the three study years.

GPS tracks indicate that participants hunted coastal caribou from Kasegaluk Lagoon in the south to a point approximately 20 miles northeast of Wainwright. In general, participants followed the shoreline during these trips, traveling less than two miles from the coast at all times. The two caribou hunting tracks that extend out into the ocean in 2010 were from one participant who reported going out for bearded seal and harvesting caribou while traveling along the coast to their bearded seal hunting areas. Participants reported coastal caribou hunting in July in all three years and continued into August and September in 2012.

Map 22: Beluga Hunting Tracks, Wainwright 2010 (July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

beluga hunting tracks (3 boat tracks representing 3 hunting trips, 2 respondents)

G beluga harvest site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 23: Beluga Hunting Tracks, Wainwright 2011 (July)

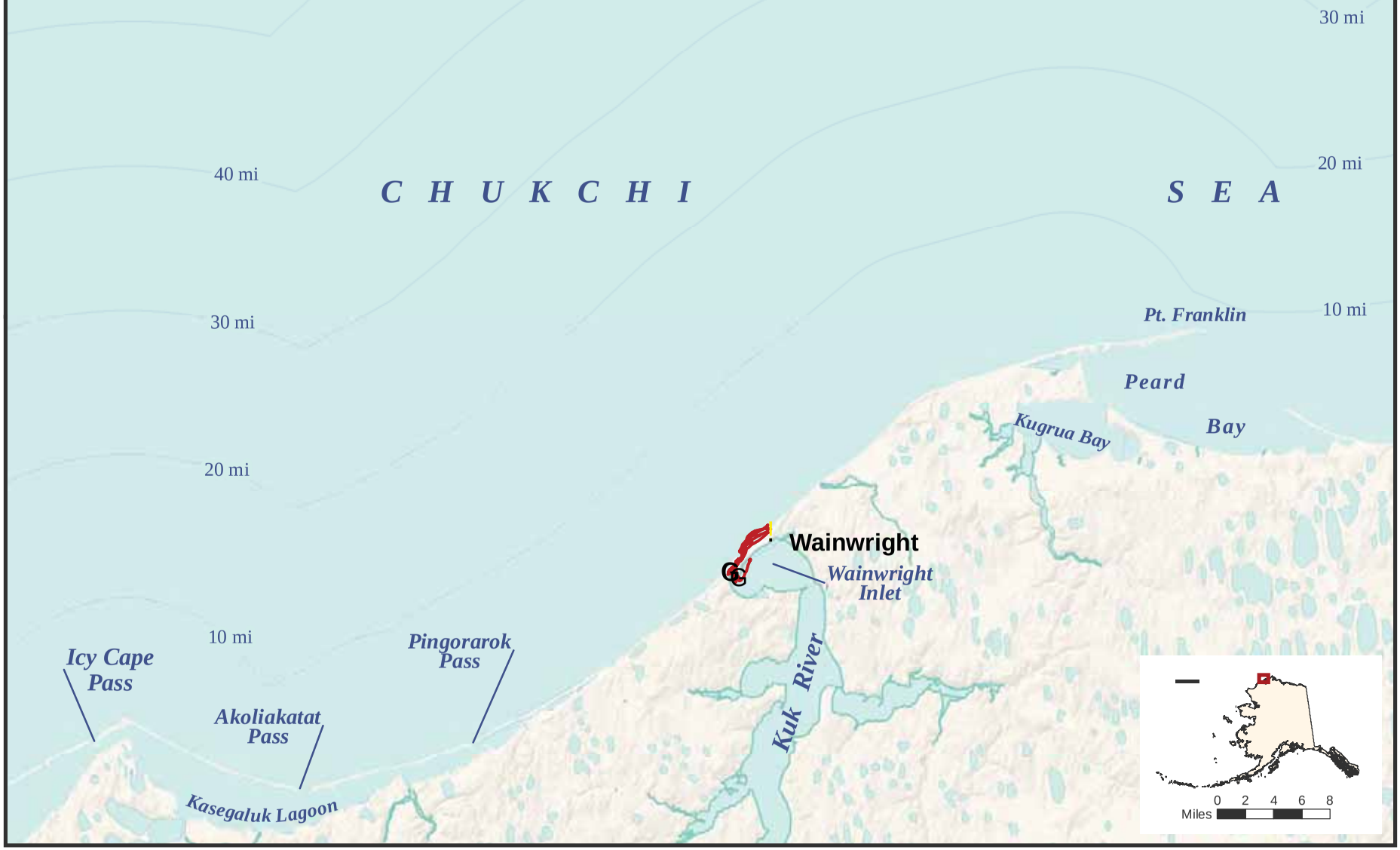
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

beluga hunting tracks (6 boat tracks representing 6 hunting trips, 6 respondents)

G beluga harvest sites (3 points, 3 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 24: Beluga Hunting Tracks, Wainwright 2012 (July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

beluga hunting tracks (8 boat tracks representing 8 hunting trips, 7 respondents)

G beluga harvest sites (3 points, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 25: Caribou Hunting Tracks, Wainwright 2010 (July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

caribou hunting tracks
(3 boat tracks representing 3 hunting trips, 2 respondents)

G caribou harvest sites (2 points, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 26: Caribou Hunting Tracks, Wainwright 2011 (July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

caribou hunting tracks
(3 boat tracks representing 3 hunting trips, 3 respondents)

G caribou harvest site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 27: Caribou Hunting Tracks, Wainwright 2012 (July-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

caribou hunting tracks
(3 boat tracks representing 3 hunting trips, 3 respondents)

G caribou harvest site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

3.2.1.6 Waterfowl Hunting Tracks

Although marine mammals were the primary focus of the study, the study team collected information for other offshore subsistence activities, including waterfowl such as brant, common and king eider, and unspecified species of duck, eider, and geese. Four participants provided waterfowl hunting tracks in 2011 and six participants reported waterfowl tracks in 2010 and 2012. Waterfowl hunting tracks are depicted on Map 28 through Map 30 and occur from a point approximately 10 miles offshore from Akoliakatat Pass in the south almost to Point Franklin in the north. Participants generally remained close to shore when hunting eider ducks, rarely venturing more than 10 miles offshore. The farthest offshore waterfowl tracks were often associated with spring bowhead whaling during which participants reported harvesting eiders; however, in other instances particularly later in the season participants reported trips for the purpose of waterfowl hunting only. The waterfowl hunting tracks occurred from March through July.

3.2.1.7 Fishing Tracks

Four participants provided four fishing tracks, primarily for salmon, during the course of the three study years (Map 31). These tracks are located in Wainwright Inlet, in the Chukchi Sea just west of Wainwright, and south of the community in Kasegaluk Lagoon. The track that extends into the Chukchi Sea was reported for bearded seal and salmon in which the participant fished for salmon the mouth of the Kuk River and then ventured farther offshore to hunt for bearded seal. Based on studies conducted in the 1980s in Wainwright (SRB&A and ISER 1993a), coastal fish are harvested in fewer quantities than freshwater fish, and rainbow smelt, which is the main coastal fish harvested by Wainwright residents, is harvested during the winter months and thus would not be captured by this study.

3.2.1.8 Wildlife Sightings

Map 32 shows 93 wildlife sightings as reported by 13 participants in 2010. Participants reported the majority of their recorded wildlife sightings for bearded seal and bowhead (96 percent). Wainwright participants also reported two ringed seal sightings and one polar bear sighting. Other than this single polar bear sighting, participants did not report any other sightings or hunting activities associated with polar bears. Due to the inconsistent nature with which wildlife observations were recorded in 2010, and the difficulty of extrapolating meaningful information from the collected data, the practice of recording wildlife sightings at the close of the 2010 boating season was ended.

3.2.1.9 Harvest Sites

Wainwright participants marked waypoints to denote the locations of resource harvests or strikes or added these waypoints during the downloading of the data. The harvest sites represent only a portion of the total offshore harvests for 2010 through 2012. A total of 46, 59, and 63 harvest/strike sites reported by Wainwright participants for the 2010 through 2012 field seasons are depicted on Map 33 through Map 35 and include resources of caribou, bearded seal, ringed seal, beluga, bowhead, and walrus. As previously mentioned, the current study was not a systematic subsistence harvest assessment in the communities, and the harvest data (including harvest locations) presented in this report are not representative of the entire community's harvests.

Map 28: Waterfowl Hunting Tracks, Wainwright 2010 (March-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

waterfowl hunting tracks
(11 boat tracks representing 11 hunting trips, 6 respondents)
species include king eider and unpecified eider

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 29: Waterfowl Hunting Tracks, Wainwright 2011 (April and June-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

waterfowl hunting tracks
(4 boat tracks representing 4 hunting trips, 4 respondents)
species include: common eider, king eider,
unspecified eider, and brant

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 30: Waterfowl Hunting Tracks, Wainwright 2012 (July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

waterfowl hunting tracks
(8 boat tracks representing 8 hunting trips, 6 respondents)
species include brant, king eider, unspecified duck,
unspecified eider, and unspecified geese

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 31: Fishing Tracks, Wainwright 2010-2012

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

fishing track (2010) fishing track (2011) fishing track (2012)

(4 boat tracks representing 4 hunting trips, 4 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

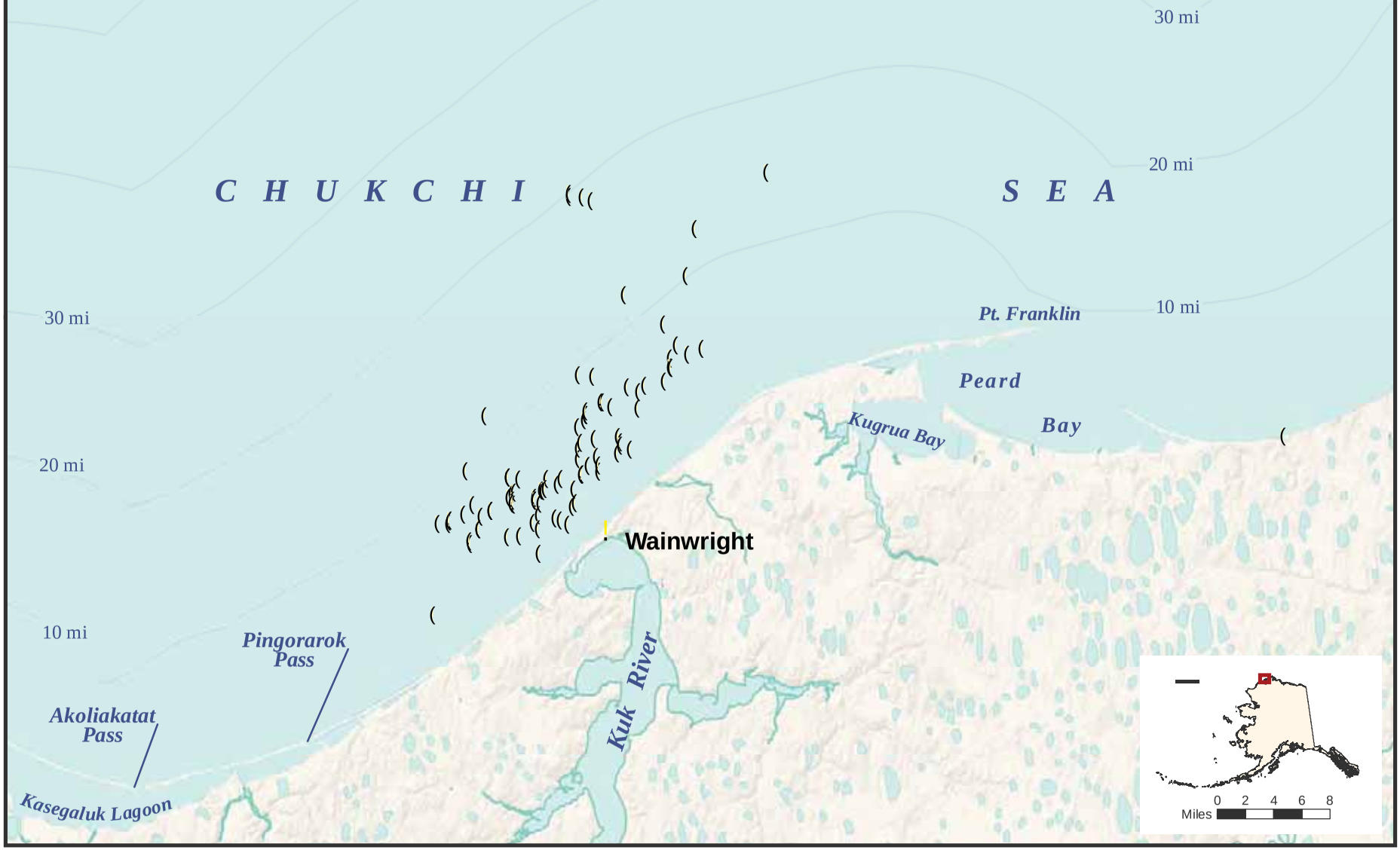
Map 32: Wildlife Sightings, Wainwright 2010 (April-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

(wildlife sightings (93 points, 13 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 33: Strike and Harvest Sites, Wainwright 2010 (March-July and September-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

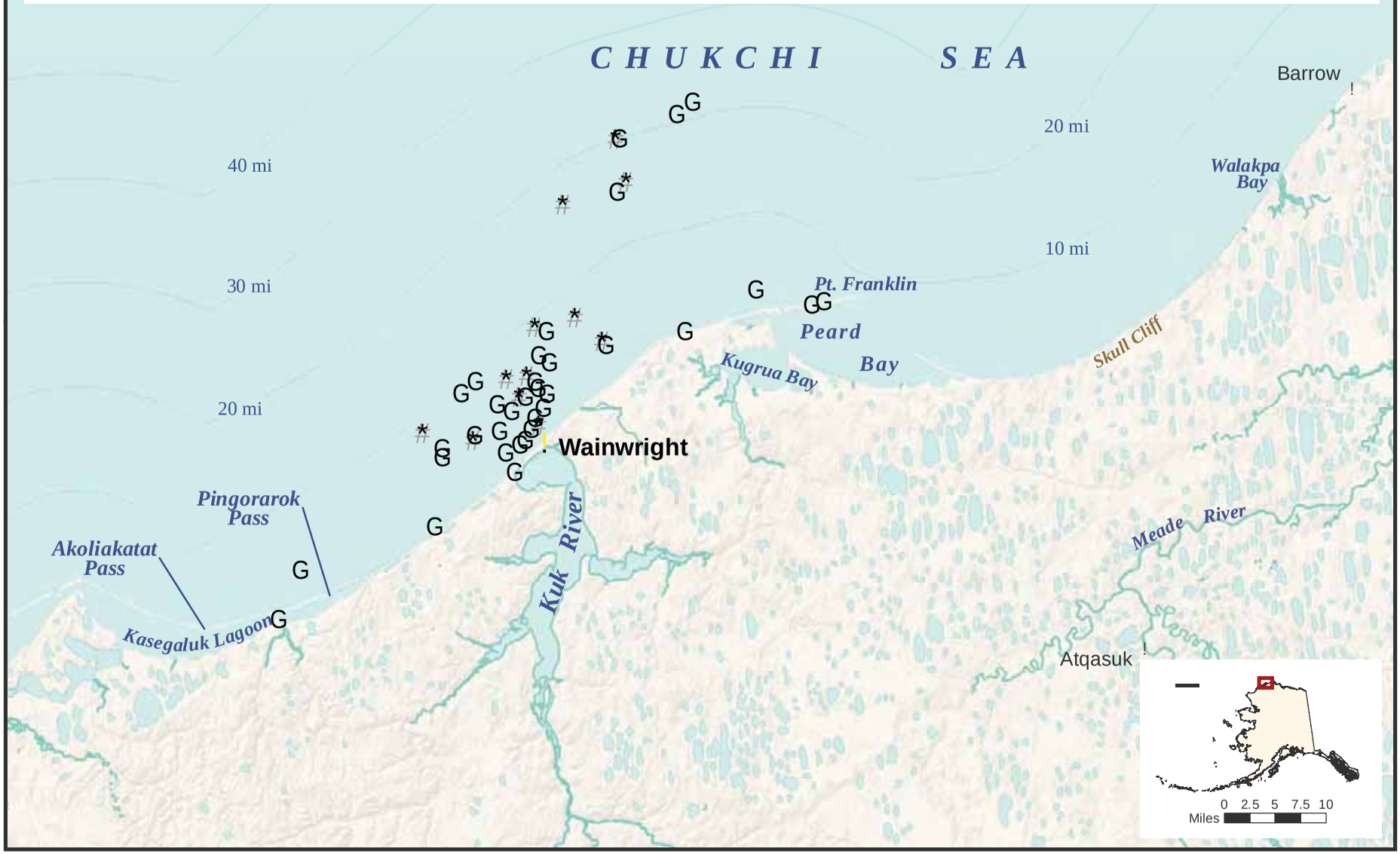
! study community

! other community

G harvest sites (34 points, 13 respondents)

*# strike sites (12 points, 8 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 34: Strike and Harvest Sites, Wainwright 2011 (June-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

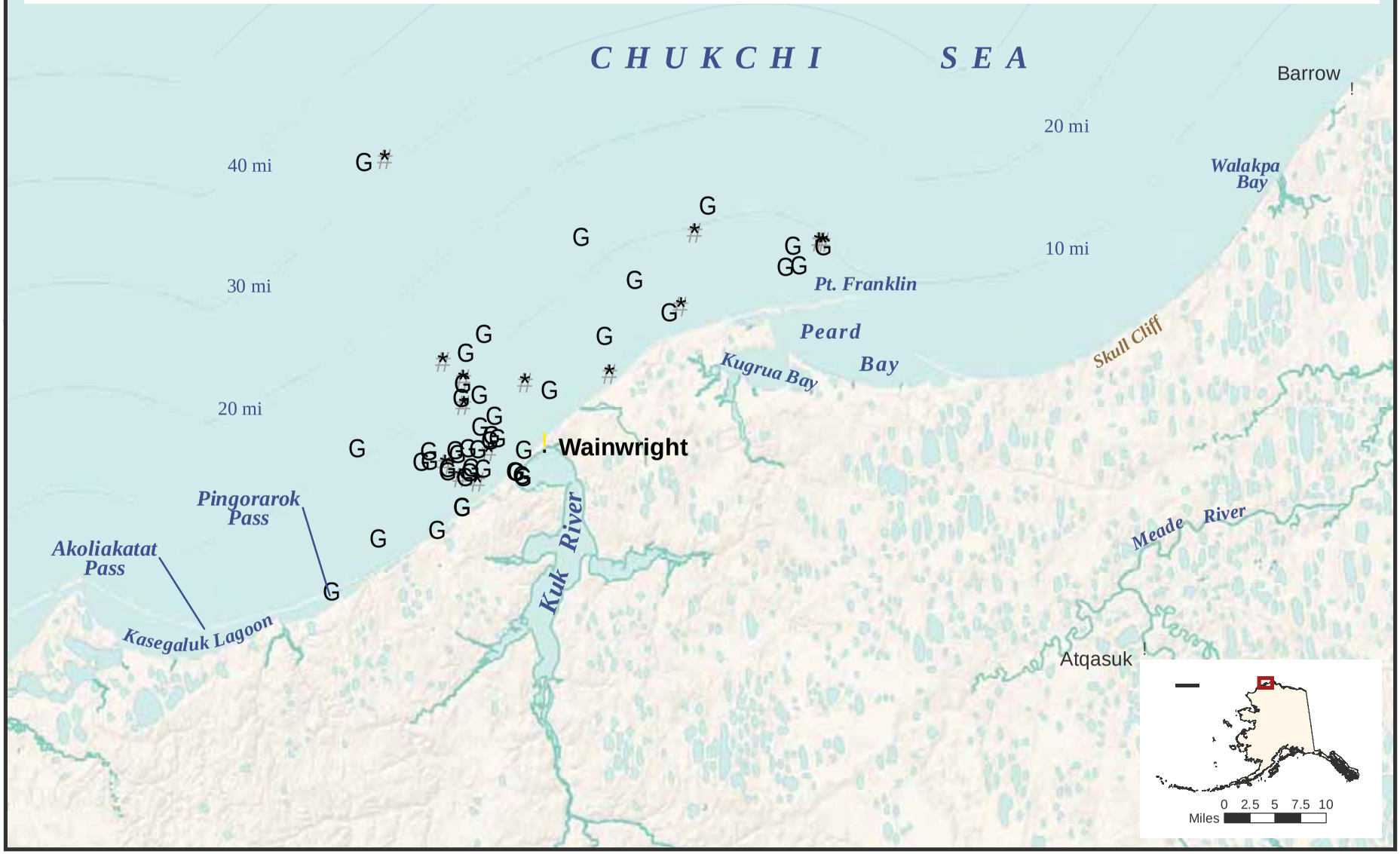
! study community

! other community

G harvest sites (45 points, 14 respondents)

*# strike sites (14 points, 8 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 35: Strike and Harvest Sites, Wainwright 2012 (May-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

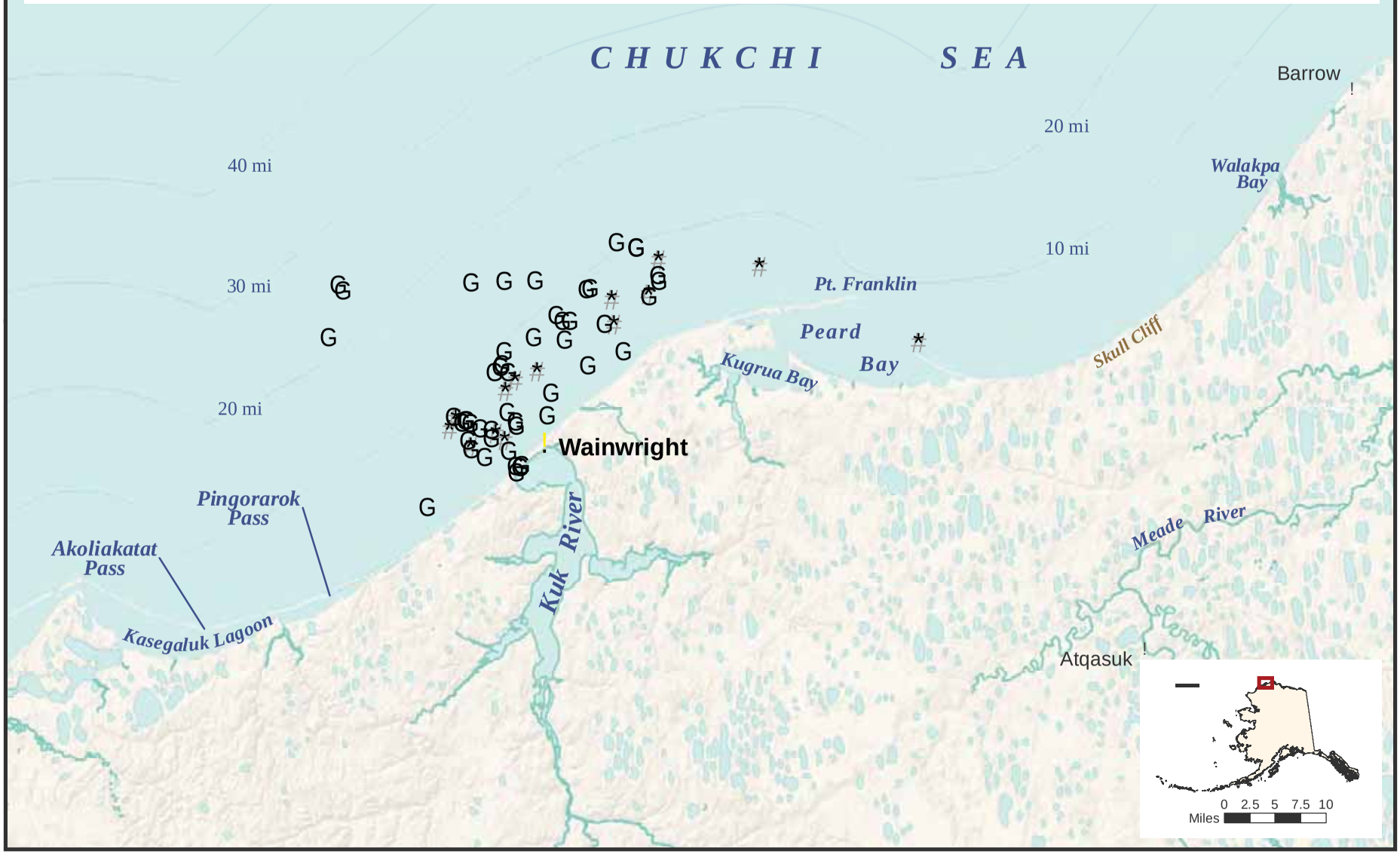
! study community

! other community

G harvest sites (49 points, 11 respondents)

* # strike sites (14 points, 5 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



3.2.2 Participant Harvests

Table 12 provides a frequency and percentage distribution of offshore hunting activity trips by target species. Wainwright participants targeted bearded seals and bowhead whales more frequently than any other species during the three study years. Participants identified multiple species as the target species for their trip on a number of occasions (e.g., scouting for bearded seal and eiders). In 2010, a total of 56 trips (46 percent) from participants identified bearded seal as a target species, and 49 trips (40 percent) where bowhead whale was the target species. These bearded seal figures were similar for 2011 and increased to 71 trips (52 percent) in 2012; participants' trips for bowhead whales decreased in 2012. The decrease in 2012 is due to the fact that Wainwright did not participate in fall whaling in 2012. Participants also targeted walrus, beluga whale, and other seal species on a greater number of trips; targeted walrus trips increased greatly during 2011 and 2012. In a few cases participants reported targeting species on boating trips that were not marine mammals; targeted non-marine mammal species include eiders, other waterfowl, coastal caribou, and fish.

Table 13 provides a frequency distribution of the species Wainwright participants reported harvesting during hunting trips in 2010, 2011, and 2012. In all study years, participants harvested bearded seal more frequently than any other marine mammal species, harvesting a total of 22, 37, and 48 bearded seals for the study years. Residents' harvests of walrus also greatly increased from 2010 through 2012 from six to 10 to 36 walrus. As discussed above, a separate study conducted by the U.S. Fish and Wildlife Service (2012) showed walrus harvests increasing from eight to 16 walrus from 2010 to 2011; data from 2012 were not available at the time of this report. The greater number of walrus reported harvested by the Fish and Wildlife Service than reported by this study's participants could be attributed to the fact that this study does not include all marine mammal hunters in Wainwright. However, in both cases the increase in harvest was confirmed by both studies.

Table 12: Wainwright Hunting Activity Trip Purpose

Target Species[1]	Number of Trips 2010	Number of Trips 2011	Number of Trips 2012
Bearded seal	56 (46%)	55 (42%)	71 (52%)
Bowhead	49 (40%)	46 (35%)	34 (25%)
Walrus	5 (4%)	25 (19%)	22 (16%)
Ringed seal	2 (2%)	4 (3%)	12 (9%)
Beluga	3 (2%)	6 (5%)	8 (6%)
Eiders	10 (8%)	2 (2%)	2 (1%)
Spotted seal	1 (1%)	2 (2%)	5 (4%)
Unspecified Seals	1 (1%)	0 (0%)	1 (1%)
Fish	1 (1%)	1 (1%)	2 (1%)
Waterfowl	0 (0%)	1 (1%)	1 (2%)
Caribou	2 (2%)	1 (1%)	3 (2%)
Eggs	0 (0%)	0 (0%)	1 (1%)
Total Number of Trips	121	131	137
[1]See Table 14 for number of resources harvested during 2010, 2011, and 2012 hunting activity trips.			

Stephen R. Braund & Associates, 2013.

Table 13: Wainwright Species Harvested during Hunting Activity Trip

Subsistence Resource	Number Harvested 2010	Number Harvested 2011	Number Harvested 2012
Bearded seal	22	37	48
Walrus	6	10	36
Bowhead[1]	3	3	4
Ringed seal	6	8	9
Spotted seal	0	0	4
Beluga[2]	11	10	34
Caribou	5	2	2
Eiders[3]	376	5	27
Brant	0	13	2
Salmon	0	2	0
Brown Bear	0	0	1

[1]As reported by Suydam et al. 2012, 2011, and 2010
[2]As reported by Goodwin 2013, 2012, and 2011
[3]Includes king and common eider harvest

Stephen R. Braund & Associates, 2013.

Over the course of the three study years, Wainwright participants recorded one, five, and six harvests of belugas during the respective 2010, 2011, and 2012 seasons. The Alaska Beluga Whale Committee reported 11, 10, and 34 belugas to be the final number of belugas landed in Wainwright in 2010, 2011, and 2012 (Goodwin 2013, 2012, and 2011). Possible explanations for the difference in harvests recorded in this study and those reported by the Alaska Beluga Whale Committee include hunters forgetting to bring their GPS or harvests that were made by Wainwright residents not involved in the study. For example, this study recorded six total harvested belugas in 2012; residents indicated they had forgotten to bring their GPS on six beluga hunting trips that resulted in 12 beluga harvested. During the November 2013 community review meetings, meeting attendees indicated that they do not have time to record all waypoints and harvests due to the intensity of the hunt and the need to maintain communication and coordination with the other boats in the hunting party. This is another example of why the harvests numbers in this study should not be taken to represent community use.

Residents also reported harvesting a large number of eiders in 2010 compared to later study years. Residents indicated during the January 2012 community review meeting that the fewer number of eiders reported harvested in 2011 was due to concerns over increased monitoring of eider harvests in a nearby community. Meeting attendees discussed that they harvested more than five eiders in 2011 and that the data in the table were not accurate. Other harvests not accounted for in Table 13 for 2011 included 60 to 70 ducks and six ringed seals because participants did not bring their GPS units on these trips. In 2012, participants reported harvesting an additional five bearded seals, 12 eiders, and three walruses on trips they did not record with a GPS.

3.2.3 Timing of Hunting Activities

The following section presents a summary of hunting activities by month for the study seasons in Wainwright. Each map shows all recorded snowmachine or boating tracks for one or more months. Maps are arranged by month in order to facilitate comparisons of travel and harvest activity by month across study years. Table 14 provides the frequency and percentage distribution of hunting trips by departure months. May, June, and July are the most active months for offshore subsistence activity and accounted

for 70 to 80 percent of offshore hunting trips during the three study years. This section also shows figures which provide a further breakdown of hunting activities by month by adding target species and harvested species as additional variables. Specifically, these figures show the number of trips by reported primary target and harvested species.

Table 14: Wainwright Month of Trip Departure

Month	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
March	2 (2%)	0 (0%)	0 (0%)
April	7 (6%)	2 (2%)	16 (12%)
May	33 (27%)	13 (10%)	21 (15%)
June	12 (10%)	25 (19%)	50 (36%)
July	55 (45%)	53 (40%)	45 (33%)
August	0 (0%)	7 (5%)	4 (3%)
September	3 (2%)	7 (5%)	1 (1%)
October	10 (8%)	25 (19%)	0 (0%)
Total	100%	100%	100%
Number of Trips	122	132	137
Chi-Square p=.000			

Stephen R. Braund & Associates, 2013.

3.2.3.1 2010

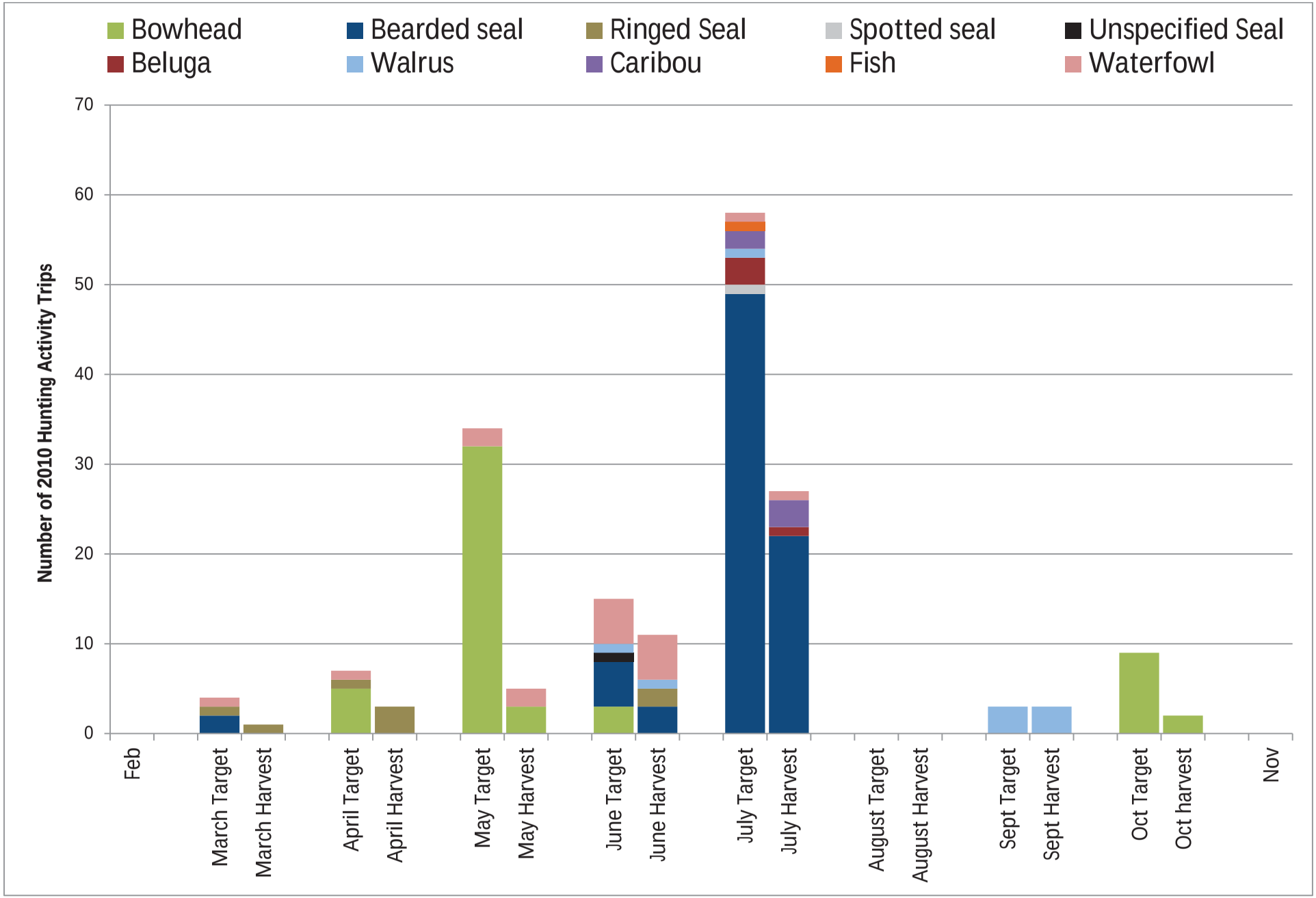
3.2.3.1.1 March

Participants began to break trail for spring whaling in March 2010. Map 36 shows two hunting tracks reported by two participants for the month of March. Participants typically travel offshore in March by snowmachine to break trail for spring whaling. Seal harvests may occur during these trips. March 2010 hunting tracks are limited to an area immediately west of Wainwright. The tracks extend no more than three miles from town. During March of 2010, participants reported scouting for eider ducks (waterfowl), bearded seals, and ringed seals, and only reporting successful harvests of ringed seals.

3.2.3.1.2 April and May

April trips were primarily bowhead whaling trips, though a few participants reported scouting for eider ducks and seals during this period; similar to March, only ringed seals were reported harvested during April (Figure 1). As the whaling season progressed, participants set up camps at the edge of ice leads approximately five miles offshore, hauling boats, food, and other supplies to their camps in preparation for the hunt. When a lead opened and hunters judged conditions to be favorable for whaling, they launched their boats into the lead from camp. Spring bowhead whaling trips peaked in May (Figure 1). Map 37 shows 39 hunting tracks reported by nine participants for the months of April and May. Participants' hunting activities during these two months extended from a point approximately 15 miles southwest of Wainwright to a point approximately 30 miles northeast of the community and up to 30 miles offshore. May was the second most active month for offshore hunting in 2010, with participants reporting a total of 33 trips (27 percent) (Table 14). Because the primary offshore activities in April and May are associated with bowhead whale hunting, Map 37 is similar to the map of bowhead whale hunting tracks (Map 14).

Figure 1: Wainwright 2010 Trips by Primary Target Species and Harvest Species and Month



Map 36: March Hunting Tracks, Wainwright 2010

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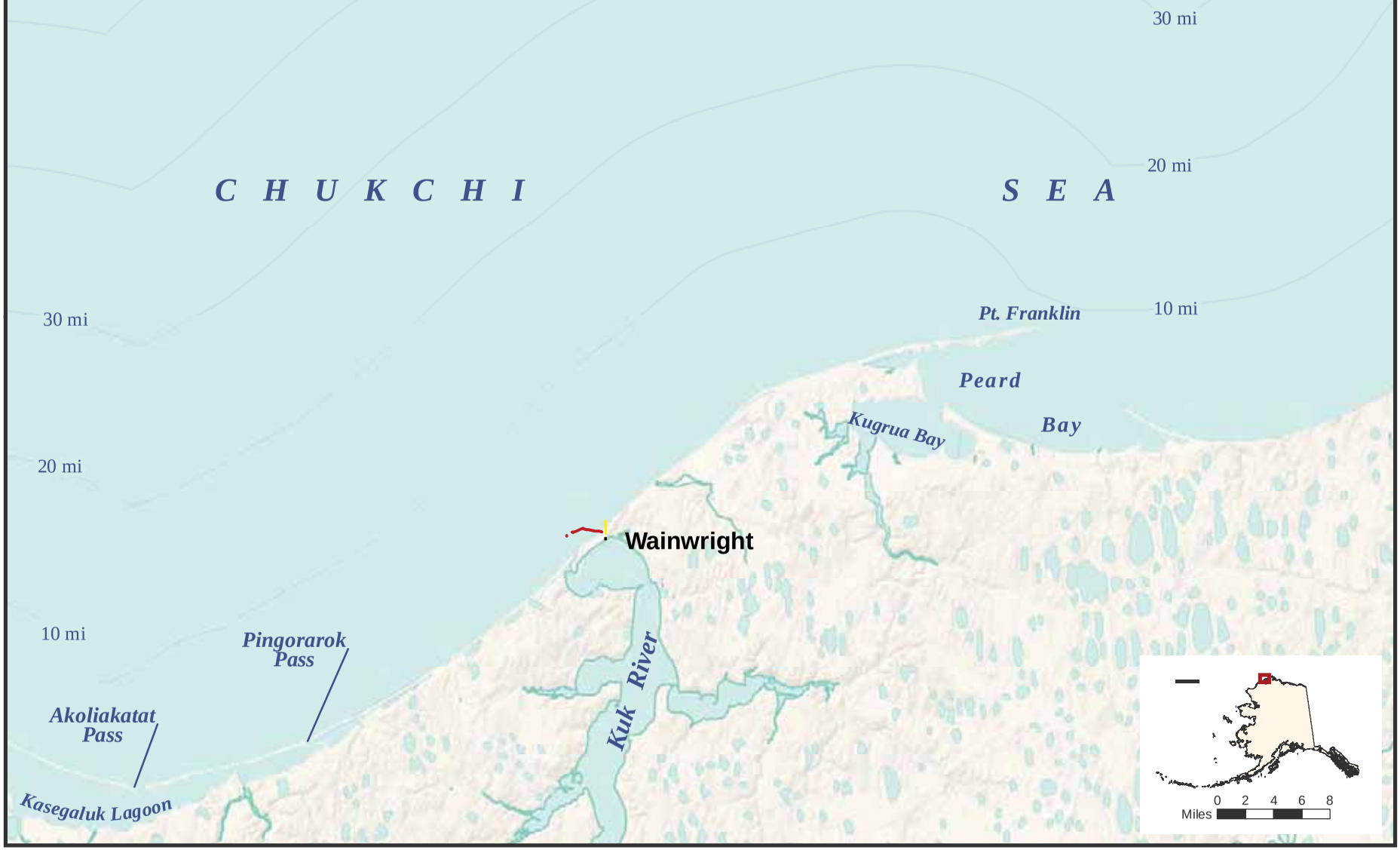
(907) 276-8222 srba@alaska.net

! study community

March hunting track

2 boat tracks representing 2 hunting trips
2 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 37: April and May Hunting Tracks, Wainwright 2010

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

April hunting track
May hunting track

39 boat tracks representing 40 hunting trips
9 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

The absence of tracks northeast of Wainwright near the coastline represents the location of shorefast ice present during the spring months. See Section 3.4.2 for discussion of ice conditions during these months.

3.2.3.1.3 June and July

In addition to the last of the bowhead whaling, June also included waterfowl (primarily eider), walrus, and other seal trips (Figure 1). Study participants were successful in harvesting all of their targeted species during June with the exception of bowhead. Participants began pursuing bearded seals in June; sealing activities peaked in July, along with additional waterfowl, walrus, beluga, caribou, and salmon (fish) trips. Although targeted, participants did not report successful harvests of walrus, spotted seals, and salmon in July. Map 38 shows 60 June and July hunting tracks for Wainwright. Compared to previous months, these tracks generally show Wainwright hunters traveling a greater distance in June and July along the coast but staying closer to shore except for the one bearded seal hunting track northeast of Wainwright that extended more than 20 miles offshore. Participants' hunting activities during this time frame extend along the coast between Kasegaluk Lagoon at Akoliakatat Pass in the south to Point Franklin in the north. Participants can generally hunt closer to the coast in June and July as the shorefast ice that was present in the spring is no longer present. Participants ranged over similar distances and locations in both June and July, though far more trips occurred in July than in June as participants indicated that offshore conditions were more favorable in July, and July is often the peak of offshore hunting activities (Table 14).

3.2.3.1.1 August and September

Participants did not report any trips in August due to poor boating conditions, including high winds and corresponding rough water. September was also a low reported activity month for 2010 offshore subsistence activities, though participants did report a few walrus trips during the month with successful harvests (Figure 1). Two September hunting tracks reported by two participants are shown on Map 39. There are few hunting trips in September compared to previous months because many Wainwright residents travel inland during this month primarily for caribou hunting and fishing. September tracks associated with walrus hunting are very close to shore.

3.2.3.1.2 October

Subsistence trips picked up briefly for fall bowhead whaling activities in October, during which time the community harvested a fall whale. The NSB reported that this was the first fall whale in over 35 years, and likely the first in more than 50 years (Suydam, George, Person, Hanns, and Sheffield 2010); Wainwright participants indicated that it had been approximately 70 years since the last fall whale harvest. Map 40 shows October hunting trips associated with fall bowhead whaling extending northeast from the community to a distance of approximately 37 miles from Wainwright and approximately 25 miles offshore. Bowhead was the only resource targeted and/or harvested during October (Figure 1). Because all fall whaling activities occurred in October, Map 40 is identical to the Wainwright 2010 fall whaling map (Map 17). Offshore subsistence activities ended in October due to freezing conditions. Counting dates of departure and separate dates of return, Wainwright participants reported a total of 122 trips during 80 calendar days between March 26 and October 16, 2010.

Map 38: June and July Hunting Tracks, Wainwright 2010

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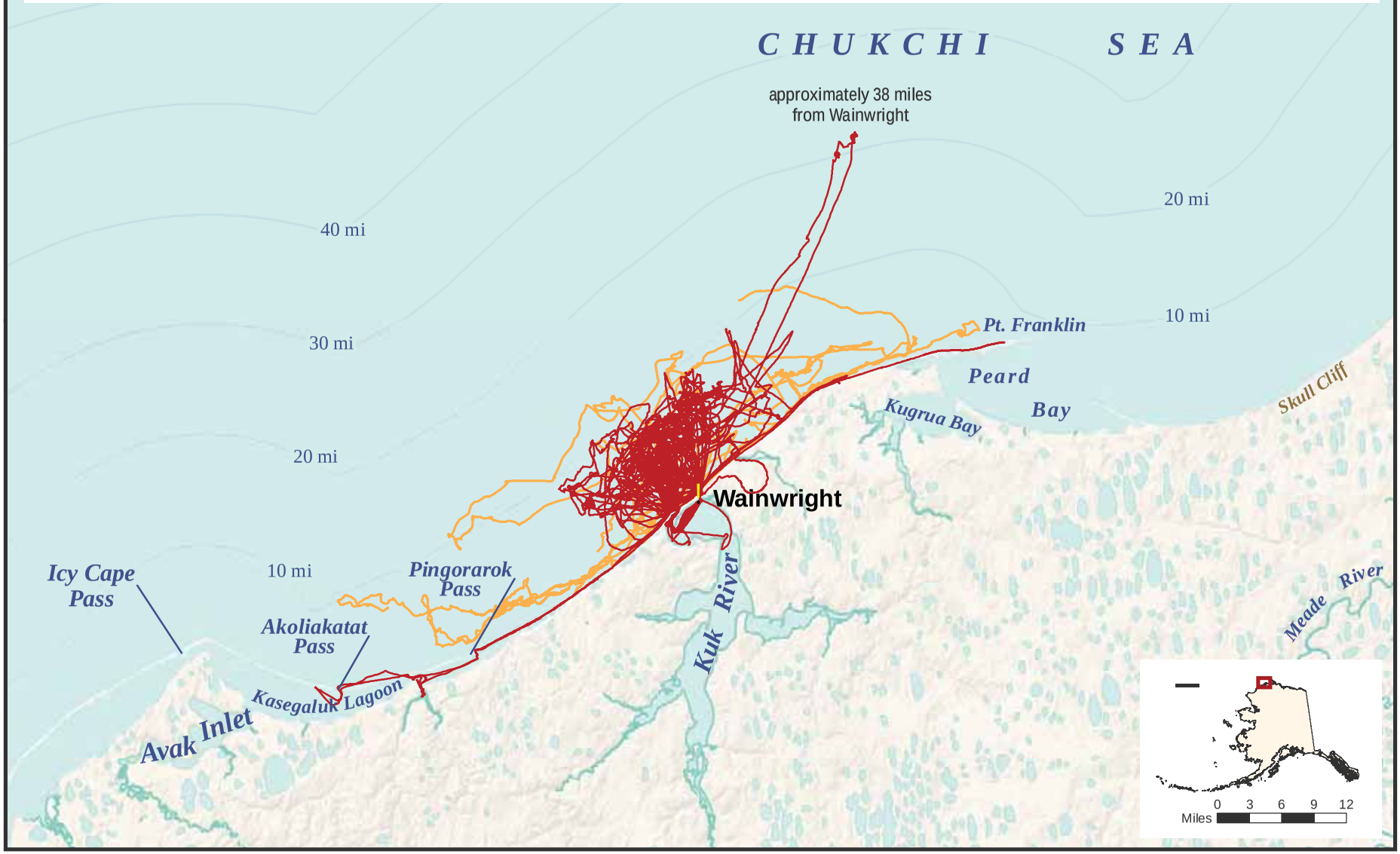
! study community

July hunting track
June hunting track

60 boat tracks representing 67 hunting trips
13 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 39: September Hunting Tracks, Wainwright 2010

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

September hunting track

2 boat tracks representing 2 hunting trips
2 respondents

No August hunting tracks were recorded during 2010.

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 40: October Hunting Tracks, Wainwright 2010

Stephen R. Braund & Associates
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(907) 276-8222 srba@alaska.net

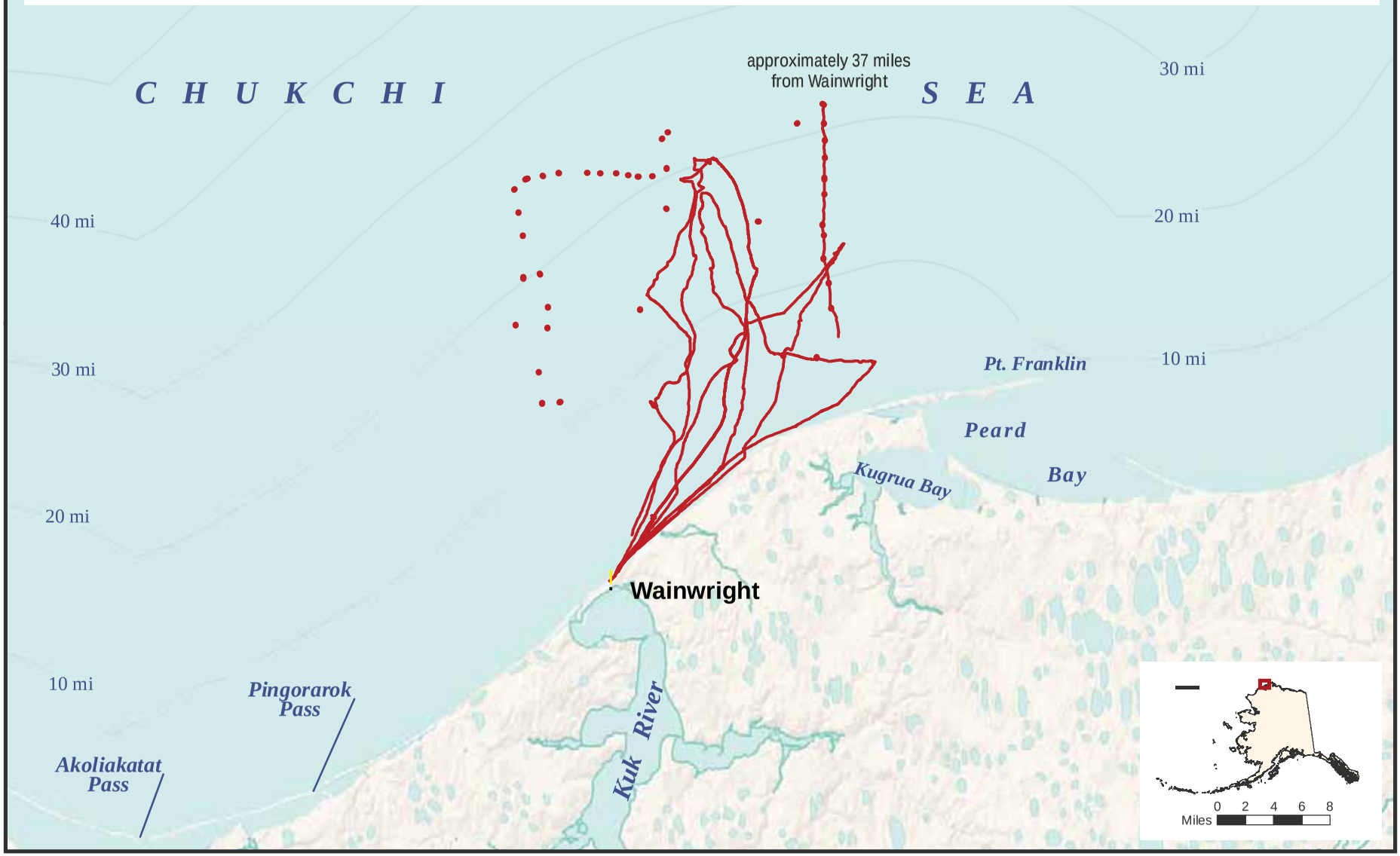
! study community

October hunting track

8 boat tracks representing 9 hunting trips
6 respondents

Red dots represent a track that recorded one respondent's location at intermittent intervals.

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



3.2.3.2 2011

3.2.3.2.1 April and May

In 2011, participants began boating offshore in April. A few participants reported scouting for bowhead whales in April, but the majority of spring bowhead whaling activities occurred in May. Participants reported that they successfully harvested a bowhead whale plus some waterfowl (primarily eider) in April (Figure 2). Wainwright whaling crews also successfully harvested a bowhead whale in May. Participants' hunting activities during these two months were concentrated north and east of the community with the farthest track approximately 35 miles northeast of Wainwright and approximately 22 miles offshore (Map 41). Several participants later said they had forgot to bring their GPS on whaling trips in 2011; as a result only 15 tracks from five participants are available for 2011.

3.2.3.2.2 June and July

Participants targeted and harvested bearded seals, ringed seals, and waterfowl in June, with an emphasis on bearded seals (Figure 2). Participants also unsuccessfully targeted walruses in June. Offshore hunting activities peaked in July, with participants targeting bearded seal, walrus, beluga whale, ringed seal, spotted seal, and caribou. Participants reported that they successfully harvested bearded seal, walrus, beluga whale, ringed seals, waterfowl, and caribou in July. Map 42 shows 74 June and July hunting tracks. Compared to previous months, tracks show Wainwright hunters traveling a greater distance in June and July along the coast but staying closer to shore due in part to the disappearance of the shorefast ice. Participants' hunting activities during this time frame extend along the coast between Kasegaluk Lagoon at Akoliakatat Pass in the south to Point Franklin, Peard Bay, and Kugrua Bay in the north.

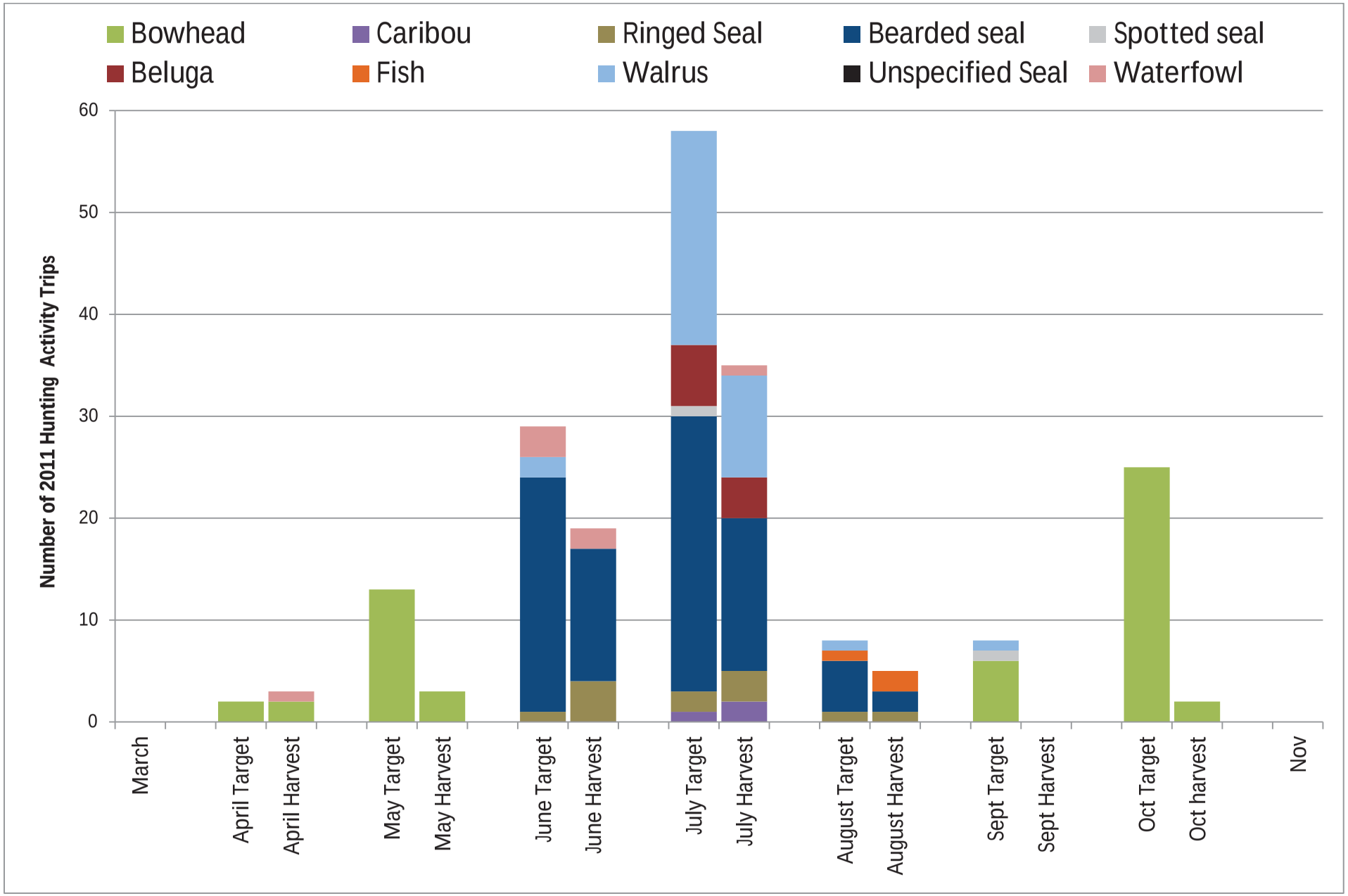
3.2.3.2.1 August and September

Offshore hunting activities declined substantially in August as most participants traveled inland to hunt caribou at this time. Participants reported targeting and successfully harvesting bearded seals, ringed seals and fish in August; they also targeted walruses but were unsuccessful (Figure 2). Participants resumed bowhead whaling activities in September and continued to target spotted seals and walruses, but did not successfully harvest any animals during this month (Figure 2). Ten August and September hunting tracks reported by seven participants are shown on Map 43. There are few hunting trips in August and September compared to previous months because the emphasis on hunting during these months shifts to inland resources such as caribou and fish. August hunting trips were concentrated in a small area just offshore from the mouth of the Kuk River. September tracks are associated with fall bowhead whaling and extend south from Wainwright to Icy Cape and north offshore up to 33 miles from Wainwright. See Sections 3.5.1 for discussion of ice conditions during these months.

3.2.3.2.2 October

Fall bowhead whaling activities increased in October and the community successfully harvested a bowhead whale, the second fall bowhead whale in as many years. Map 44 shows October hunting trips associated with fall bowhead whaling and extending north, northwest, and northeast from the community to a distance of approximately 40 miles and over 30 miles from the nearest shore. Because all fall whaling activities occurred in October, Map 40 is similar to the Wainwright 2011 fall whaling map (Map 18). In 2011, October (as well as June) was the second most active month in 2011, with 25 trips (19 percent of the total). Counting dates of departure and separate dates of return, Wainwright participants reported 132 trips of offshore subsistence activity during 52 calendar days between April 29 and October 29, 2011.

Figure 2: Wainwright 2011 Trips by Primary Target Species and Harvest Species and Month



Map 41: April and May Hunting Tracks, Wainwright 2011

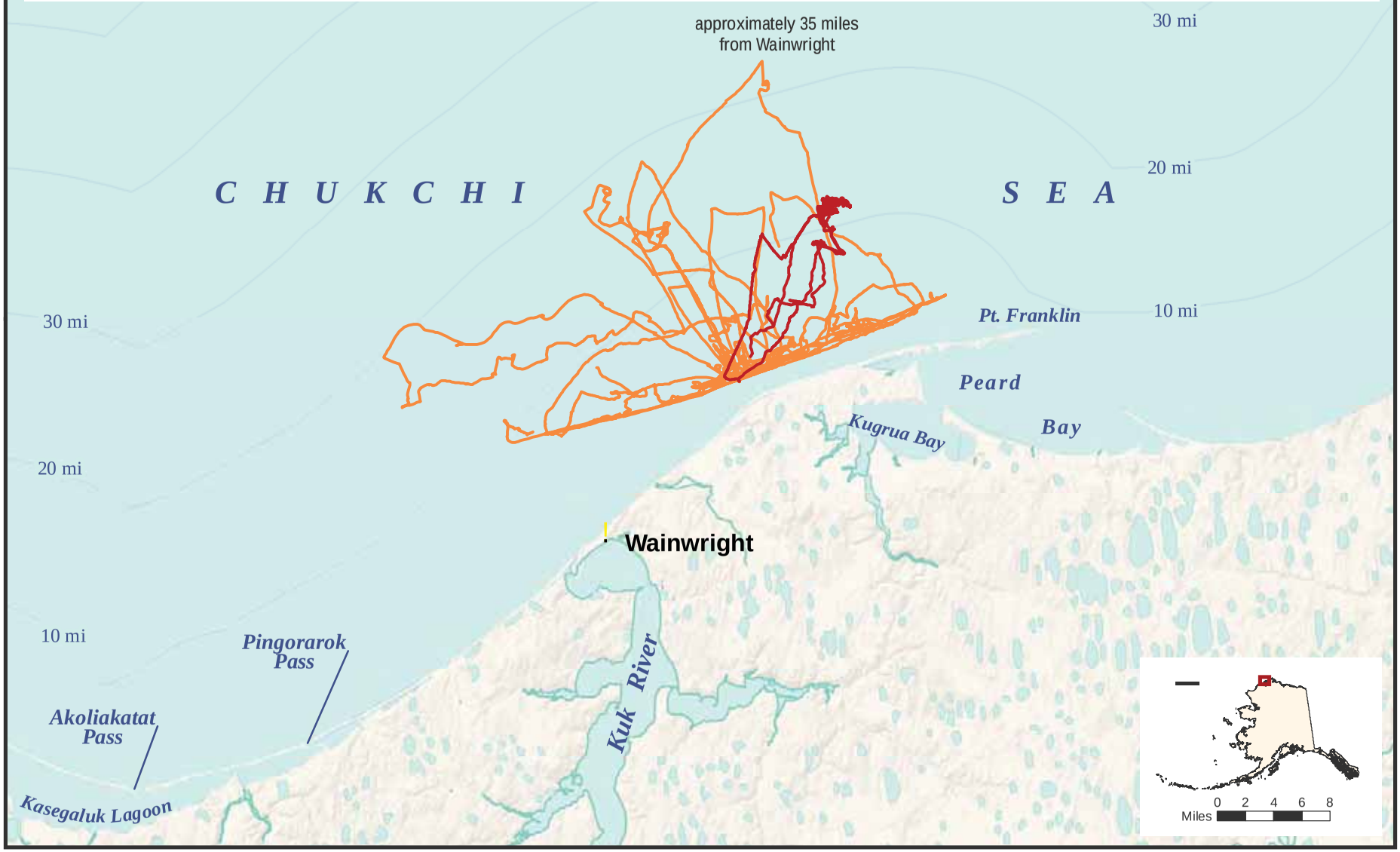
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

April hunting track
May hunting track

15 boat tracks representing 15 hunting trips
5 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 42: June and July Hunting Tracks, Wainwright 2011

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

July hunting track
June hunting track

74 boat tracks representing 78 hunting trips
18 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 43: August and September Hunting Tracks, Wainwright 2011

Stephen R. Braund & Associates
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(907) 276-8222 srba@alaska.net

! study community

August hunting track

September hunting track

10 boat tracks representing 14 hunting trips
7 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

Map 44: October Hunting Tracks, Wainwright 2011

Stephen R. Braund & Associates
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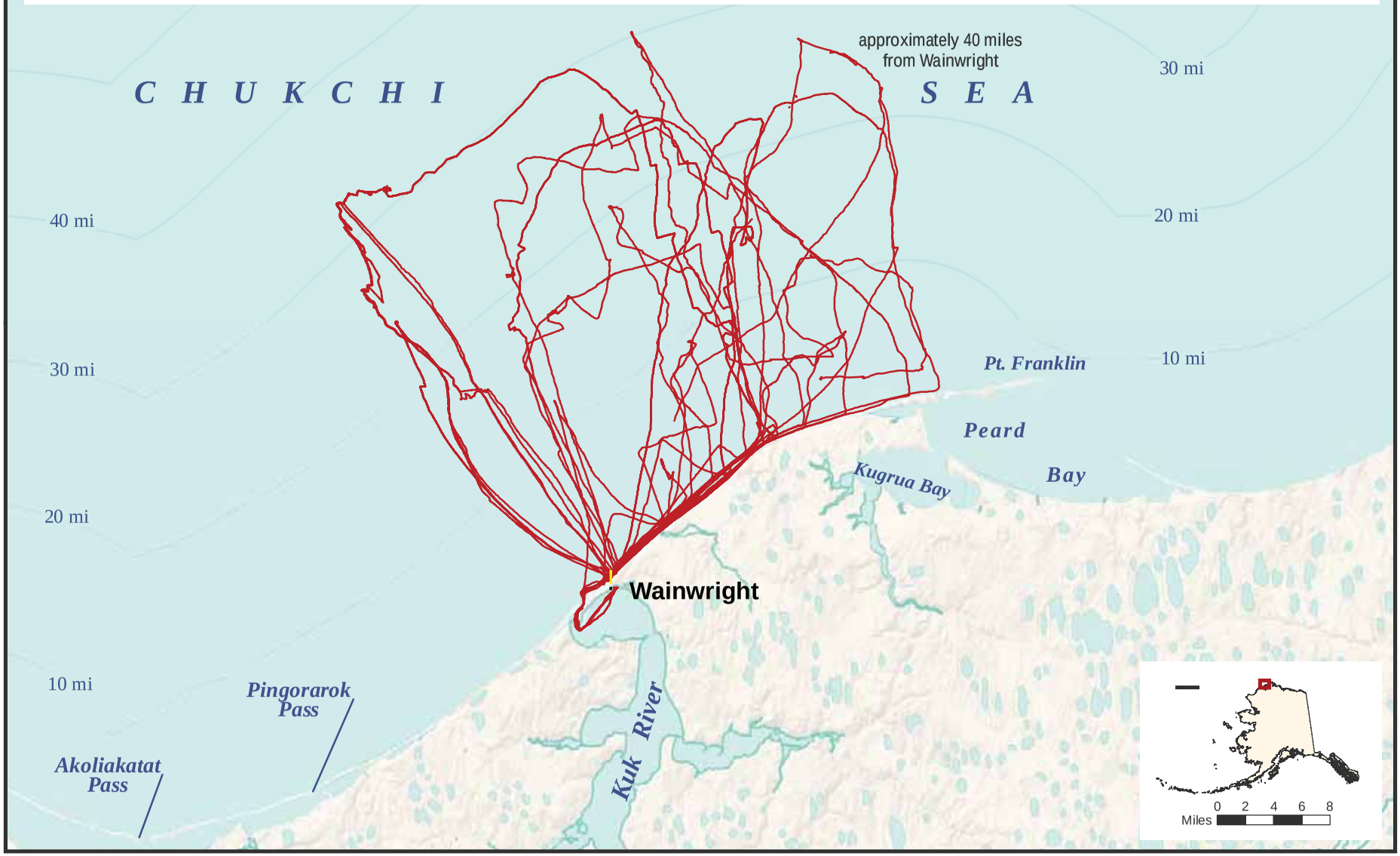
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

October hunting track

22 boat tracks representing 25 hunting trips
9 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



3.2.3.3 2012

3.2.3.3.1 April and May

Offshore hunting activities in 2012 began in April as residents began their spring whaling pursuits and reported successful harvests of both bowhead and waterfowl (primarily eider) during this month (Figure 3). Offshore activity increased in May with additional successful harvests of bowhead and waterfowl in addition to ringed seal. During these two months, eight participants reported 32 offshore hunting tracks, which are shown on Map 45. The distribution of tracks for April and May are concentrated northeast of the community as far as Point Franklin. The majority of activities occurred for bowhead whaling in leads located approximately two to 10 miles offshore. A few tracks also extended southwest of the community towards Pingorarok Pass. April and May accounted for approximately one-quarter of Wainwright's 2012 offshore hunting activities (Table 14).

3.2.3.3.2 June and July

By June 2012, the shorefast ice was deteriorated or gone, the spring bowhead migration had generally passed Wainwright, and Wainwright participants turned their focus to harvests of bearded seal followed by walrus and ringed seal and reported successful harvests of all three species (Figure 3). Eggs and waterfowl were also reported as target species with successful harvests of waterfowl. In addition to the beluga, walrus, and waterfowl, residents reported targeting beluga, caribou, spotted seal, and fish in July and reported successful harvests of all targeted resources except for fish. In total, 15 participants provided 95 hunting tracks for these two months; these tracks accounted for nearly 70 percent of all 2012 offshore activities (Map 46; Table 14). Tracks were distributed north and south of the community with the majority of tracks to the northwest and northeast of the community. The farthest extent of tracks during these two months occur from Icy Cape Pass in the south to Peard Bay in the north with several tracks occurring approximately 26 miles from Wainwright in June.

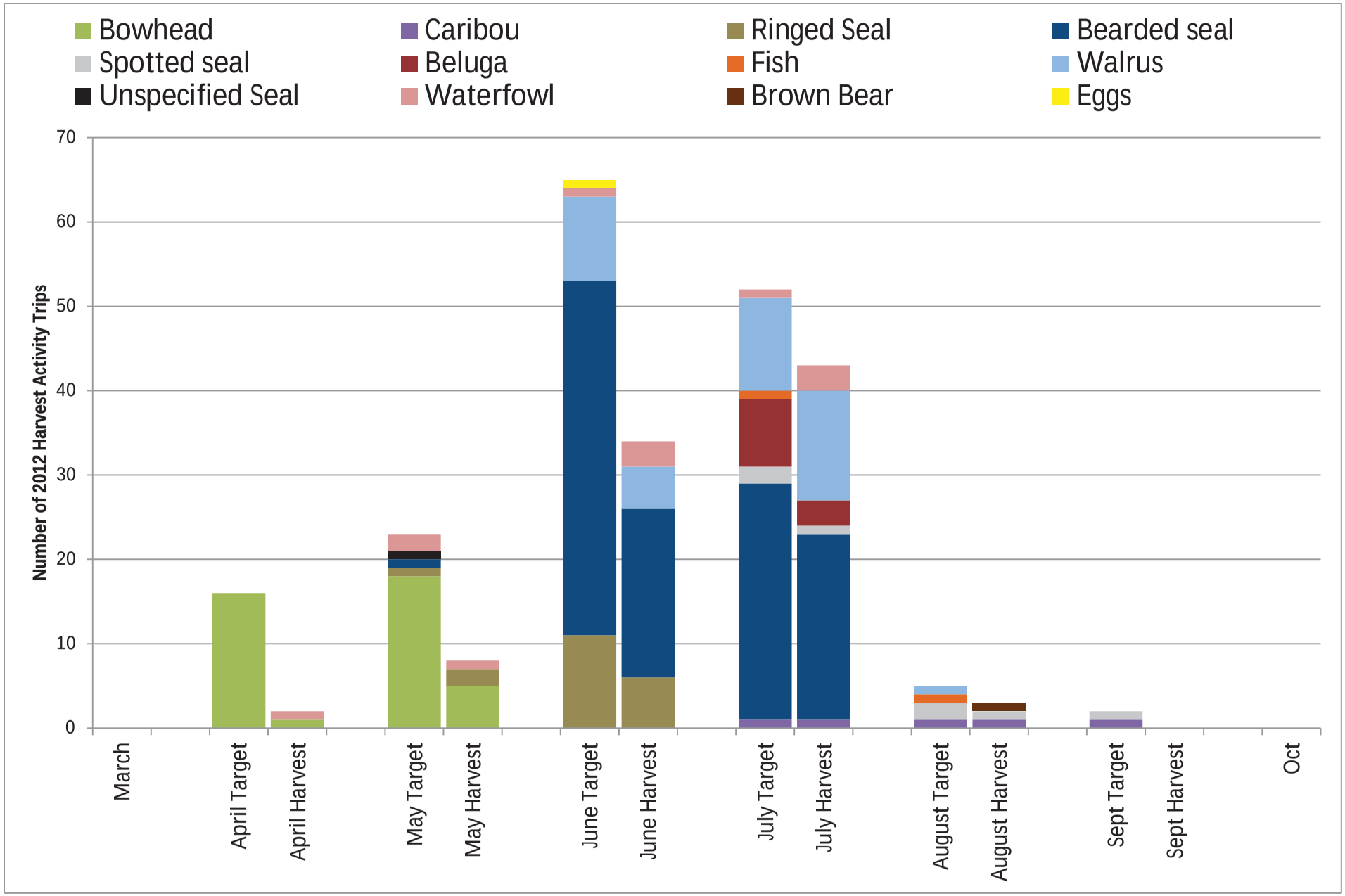
3.2.3.3.1 August and September

Similar to previous years, Wainwright 2012 hunting activities in August and September were fewer than previous months as residents primarily focus on inland hunting activities during this time. Only three participants provided five offshore tracks for August and September (Map 47). These tracks occurred southwest of the community as far as Kasegaluk Lagoon and Icy Cape Pass. Despite the relatively few offshore trips, residents reported targeting walrus, spotted seal, caribou and fish during August and caribou and walrus for September (Figure 3). In August, successful harvests of caribou and walrus were reported in addition to an opportunistic harvest of a brown bear. Fall offshore hunting activities accounted for fewer than five percent of 2012 offshore hunting (Table 14).

3.2.3.3.2 October

October is the primary month for fall bowhead whaling. However, in 2012, Wainwright chose not to try for a fall bowhead whale hunt because high winds and swells in September made conditions dangerous for fall whaling, and Wainwright had a successful spring hunt and only had one strike left for the 2012 whaling season that they gave away to another community. Thus no offshore hunting activity occurred during this month. Counting dates of departure and separate dates of return, Wainwright participants reported 137 trips of offshore subsistence activity during 56 calendar days between April 18 and September 21, 2012.

Figure 3: Wainwright 2012 Trips by Primary Target Species and Harvest Species and Month



Map 45: April and May Hunting Tracks, Wainwright 2012

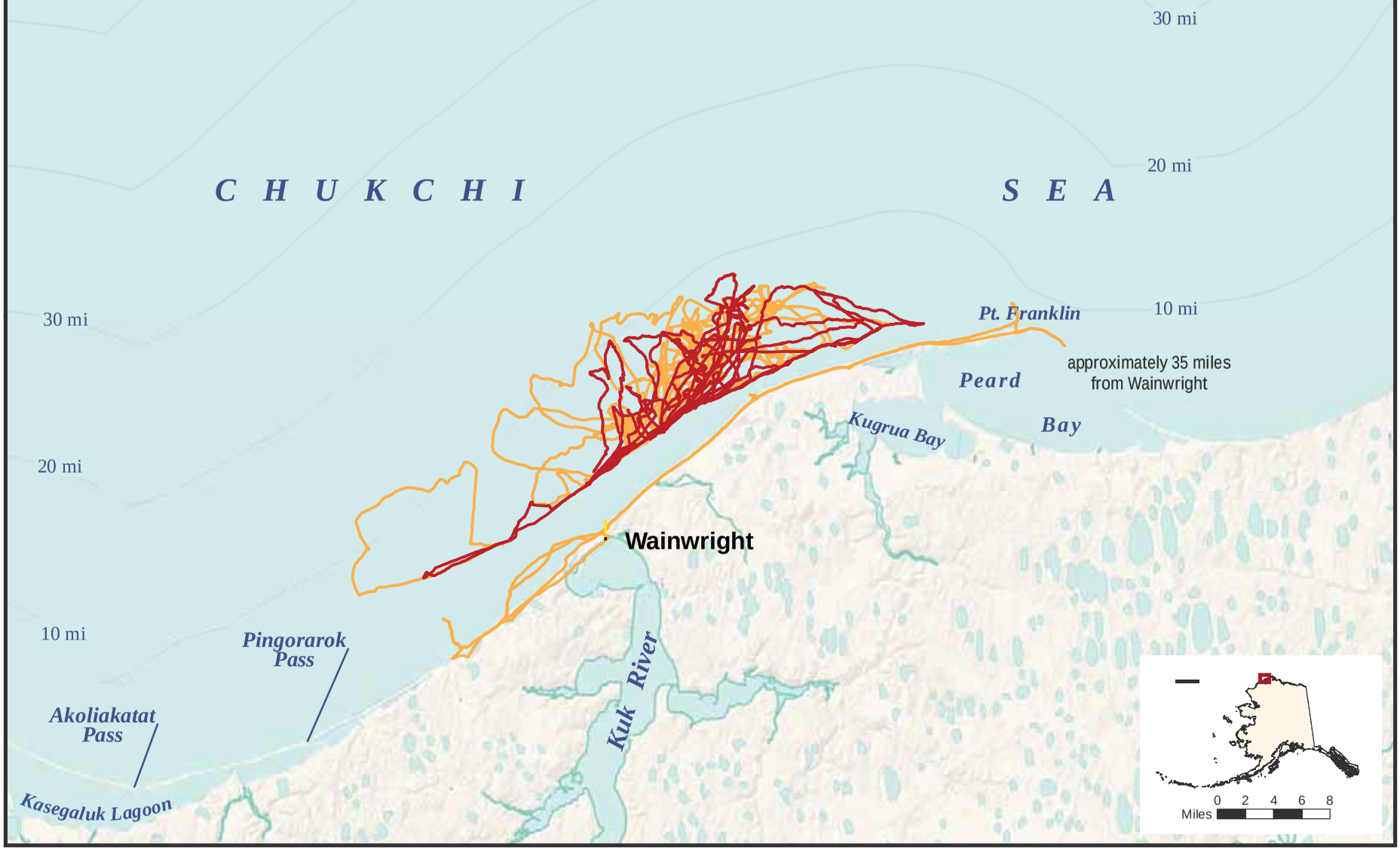
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

April hunting track
May hunting track

32 boat tracks representing 37 hunting trips
8 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 46: June and July Hunting Tracks, Wainwright 2012

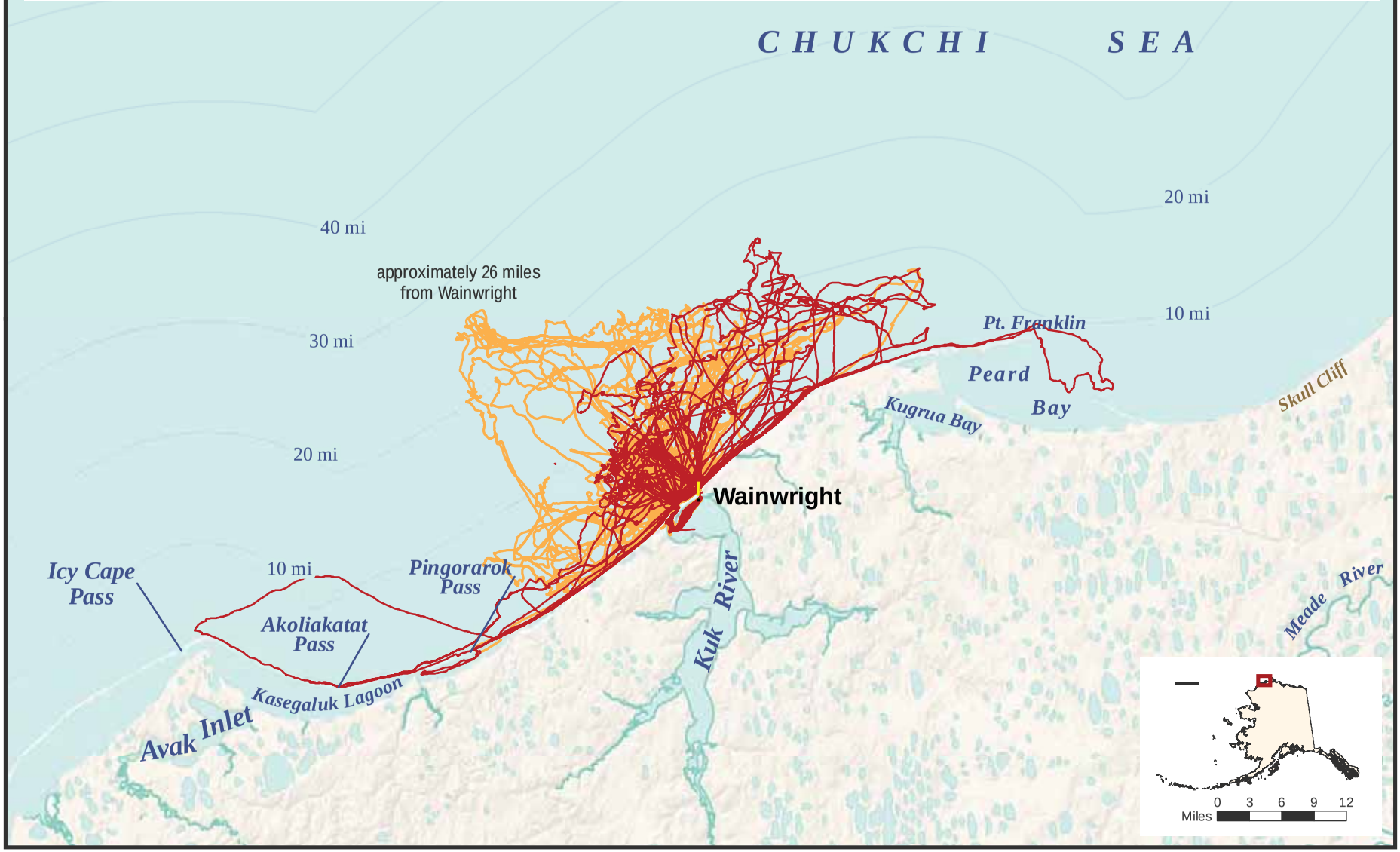
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

July hunting track
June hunting track

95 boat tracks representing 95 hunting trips
15 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 47: August and September Hunting Tracks, Wainwright 2012

Stephen R. Braund & Associates
P.O. Box 1480
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(907) 276-8222 srba@alaska.net

! study community

August hunting track

September hunting track

5 boat tracks representing 5 hunting trips
3 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

3.2.3.4 Comparison of Three Study Years

The following discussion briefly summarizes Wainwright's offshore seasonal round based on the limited three years of study data. In the study years, April and May are months in which participants focused on spring bowhead whaling activities with some waterfowl (primarily eider) hunting occurring as well. June, in turn, shows an emphasis on sealing activities (primarily for bearded seal) with some targeting of waterfowl and walrus. As stated above, July is one of the most active months for offshore subsistence activities (as measured by number of trips) that are primarily focused on bearded seal, walrus, and beluga harvesting. Walrus and beluga hunting in 2010 was reportedly much less than it was in 2011 and 2012 during the month of July. Although poor weather conditions prohibited participants from taking offshore trips during August 2010, this month represents a period of lesser offshore subsistence activity (based on 2011 and 2012 data) with some seal, walrus, and fishing activity. September also has a relative few number of offshore subsistence trips compared to earlier summer months. Community members indicated during the November 2013 meeting that activities during these two months are primarily focused inland for resources such as caribou and fish. Offshore activity increases in October for bowhead whaling, which the community chose not to participate in during October of 2012 due to weather conditions and a productive spring bowhead harvest.

A comparison of April and May hunting tracks for all three study years shows somewhat similar distribution in tracks extending northeast towards Point Franklin and southwest towards Pingorarok Pass (Map 37, Map 41, and Map 45). The lack of tracks northeast of Wainwright near the coastline represents the general location of shorefast ice that was present during these months. The offshore extent of April and May hunting tracks was much greater in 2010 and 2011, extending 36 and 35 miles from Wainwright (approximately 22 to 30 miles offshore), than 2012 tracks that were located no more than approximately 10 miles offshore. As discussed above, several Wainwright participants forgot their GPS in 2011 during spring bowhead whaling and as a result the 2011 tracks (15) are less than the 2010 (40) and 2012 (37) tracks. Participants did not report ringed seal hunting in April and May of 2011 as they had in 2010 and 2012.

June and July hunting tracks from 2010 and 2011 (Map 38 and Map 42) exhibit a similar distribution northeast and southwest of Wainwright as those reported in 2012 (Map 46) for the same time period. Whereas offshore distances were similar in 2010 and 2011 (approximately 10 miles), the offshore tracks in June and July of 2012 extend beyond 10 and 25 miles. In 2010 and 2011 study years, July was the most active month for offshore subsistence activity for Wainwright participants in terms of number of tracks (Table 14). Participants reported a total of 55 trips (45 percent) in July 2010 and a total of 53 trips (40 percent) in July 2011. June was the most active month in 2012 and represented a nearly two-fold increase in trips (19 to 36 percent of trips) from the previous year. Participants discussed that the sea ice lingered in the Wainwright area for several weeks more than in recent years and this is one of the reasons for the increased number of trips in June. Participants reported targeting/harvesting the same resources during June and July for all three study years with the exception of fish in 2011 and addition of bowhead in 2010 and eggs in 2012.

Comparison of 2010 September (there were no tracks in August 2010) tracks (Map 39) with the 2011 August and September tracks (Map 43) show a greater number of September 2011 tracks that ranged much farther north and south of the community than in 2010. The reason for this difference is that Wainwright participants reported bowhead whale hunting in September 2011 and did not report any in September of 2010. Similarly, Wainwright 2012 August and September tracks (Map 47) did not extend as far offshore because the community did not attempt bowhead whaling during September of 2012 as they had in September of 2011. In general, August and September offshore hunting activities are much less than June and July. Figure 1 through Figure 3 show that the resources targeted during August and September are highly variable with only walrus being the resource targeted/harvested in all study years.

The distribution of October hunting tracks in 2010 (Map 40) is similar to that in 2011 (Map 44) but with more tracks and participants reporting in 2011 (22 tracks, nine participants) than in 2010 (eight tracks, six participants). The greater number of tracks in 2011 is in part due to the fact that Wainwright participants expended more days searching for bowhead whales before successfully harvesting than they did in 2010. No October hunting occurred in 2012. For 2010 and 2011, only bowhead was reported as either a target or harvested species.

3.2.4 Duration of Hunting Activities

Table 15 provides a frequency and percentage distribution of trip duration by hunting activity trips. The distribution of trip durations was consistent across study years. In all three years, the majority (72-73 percent) of hunting trips were eight hours or less in duration. Less than 10 percent of trips were longer than 12 hours and only one trip was reported as lasting more than 24 hours in the three study years. As discussed in the methods, multiple trips based out of a remote camp were counted as individual trips and the trip duration of these activities is based on time away from camp and not time away from community.

Table 15: Wainwright Duration of Trips

Duration	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
4 hours or less	28 (28%)	26 (25%)	36 (30%)
4-8 hours	45 (45%)	50 (47%)	52 (43%)
8-12 hours	19 (19%)	22 (21%)	26 (22%)
12-24 hours	8 (8%)	7 (7%)	6 (5%)
more than 24 hours	0 (0%)	1 (1%)	0 (0%)
Total	100%	100%	100%
Number of trips	100	106	120
Chi Square p = .944			

Stephen R. Braund & Associates, 2013.

Map 48 through Map 50 display Wainwright hunting trips by duration of trip with separate colors indicating trips four hours or less, four to eight hours, eight to 12 hours, and 12 or more hours in length. While trips of four hours or less are generally located closer to Wainwright than trips of longer duration, there is less correlation between trips lasting more than four hours and distance from shore. A number of trips of shorter duration are of similar extent as those of the longest duration, which indicates that duration of trip is tied more closely to the type of subsistence activity rather than the distance from shore. For example, a Wainwright whaling crew may harvest a bowhead whale within 10 miles of shore but spend 12-24 hours in their search and towing of the whale; whereas a Wainwright resident may travel 15 miles offshore in search of a seal and be able to harvest and butcher the animal in 8-12 hours.

Table 16 provides a frequency and percentage distribution of departure and return times by trip for the three study years. Most hunting trips began in the morning or afternoon. In 2010 and 2012, the most frequent departure times occurred between noon and 6:00 p.m. followed by morning departure times (6:00 a.m. to noon). In 2011, departure times during the morning and afternoon were evenly distributed and accounted for 77 percent of all departure times. The most common return time during all three study years was between 6:00 p.m. and midnight with approximately two-thirds of trips reporting a return time between 6:00 p.m. and midnight in 2010 and 2012, and half of trips reporting the same return time in 2011. The fewest number of departures occurred from midnight to 6:00 a.m. in the three study years, and the fewest number of returns to the community occurred between 6:00 a.m. and noon.

Map 48: Duration of Hunting Trip, Wainwright 2010 (April-July, September, and October)

Stephen R. Braund & Associates
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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

trip duration:
12 hours - 19 hours
8 tracks, 6 respondents

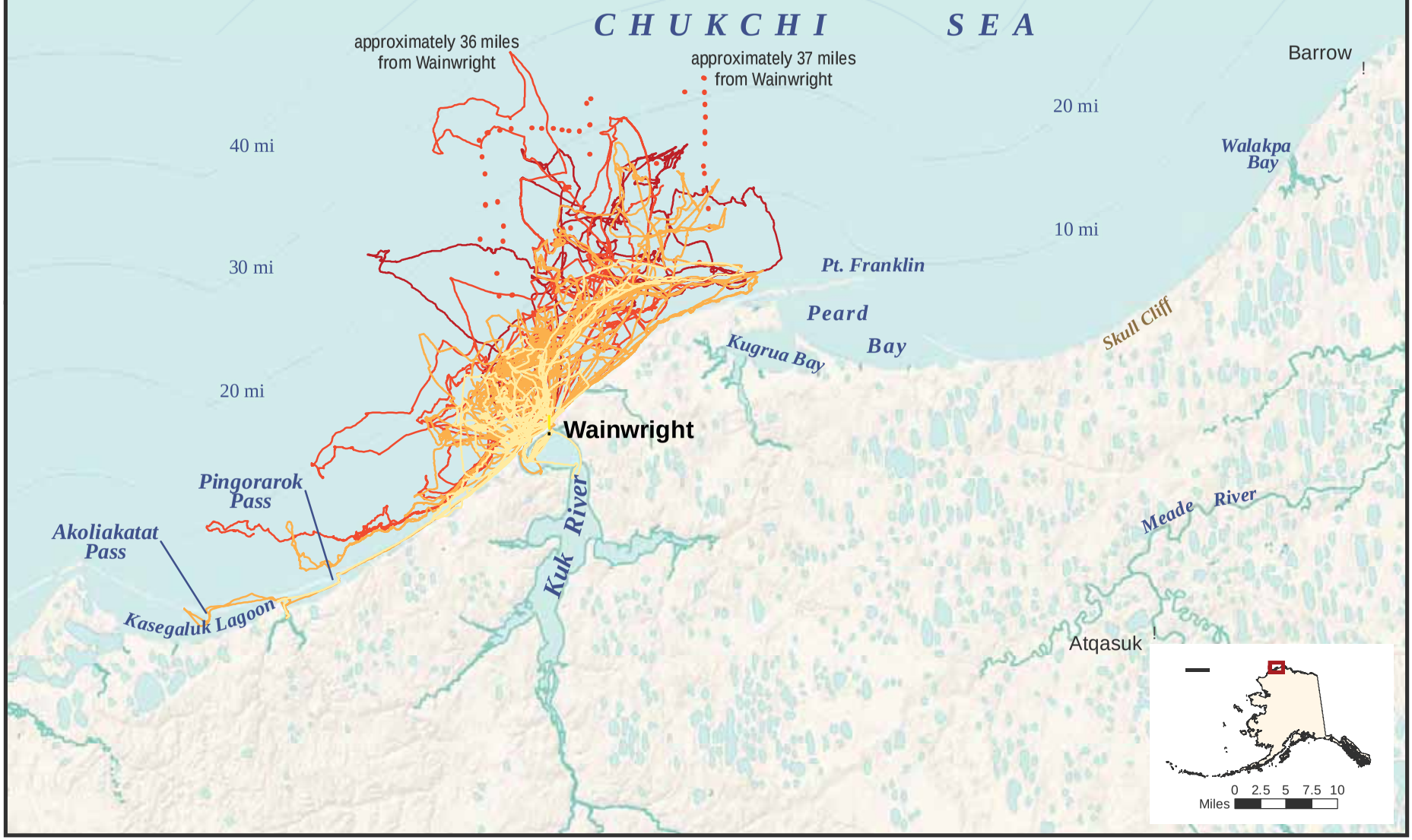
trip duration:
8 hours - 12 hours
18 tracks, 9 respondents

trip duration:
4 hours - 8 hours
41 tracks, 15 respondents

trip duration:
0 hours - 4 hours
23 tracks, 8 respondents

all durations:
90 boat tracks representing
98 hunting trips, 16 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 49: Duration of Hunting Trip, Wainwright 2011 (April-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

trip duration:
12 hours - 30 hours
8 tracks, 6 respondents

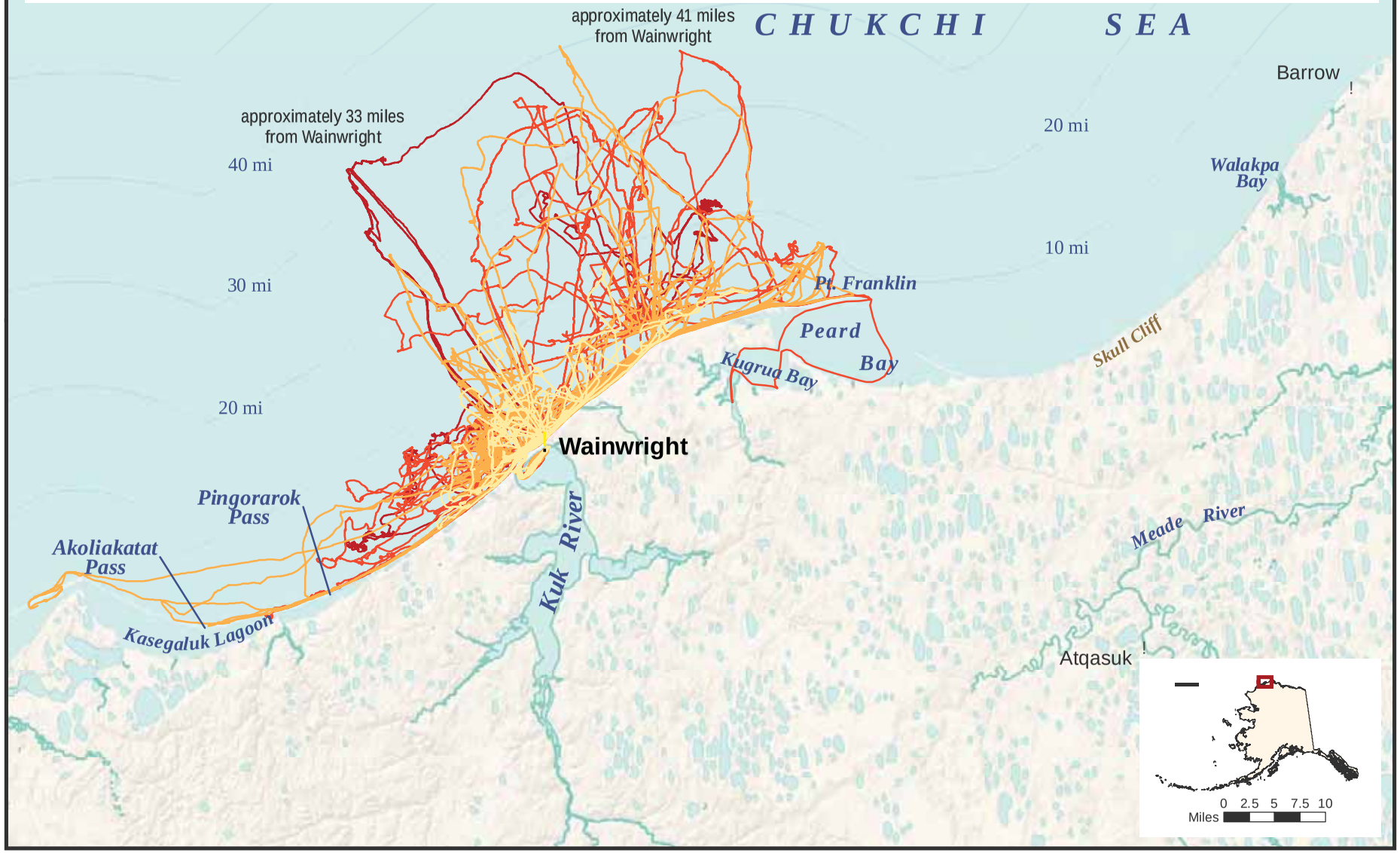
trip duration:
8 hours - 12 hours
22 tracks, 14 respondents

trip duration:
4 hours - 8 hours
42 tracks, 17 respondents

trip duration:
0 hours - 4 hours
24 tracks, 10 respondents

all durations:
96 boat tracks representing
106 hunting trips, 21 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 50: Duration of Hunting Trip, Wainwright 2012 (April-September)

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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

trip duration:
12 hours - 20 hours
5 tracks, 4 respondents

trip duration:
8 hours - 12 hours
25 tracks, 10 respondents

trip duration:
4 hours - 8 hours
52 tracks, 15 respondents

trip duration:
0 hours - 4 hours
34 tracks, 14 respondents

all durations:
116 boat tracks representing
120 hunting trips, 16 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.

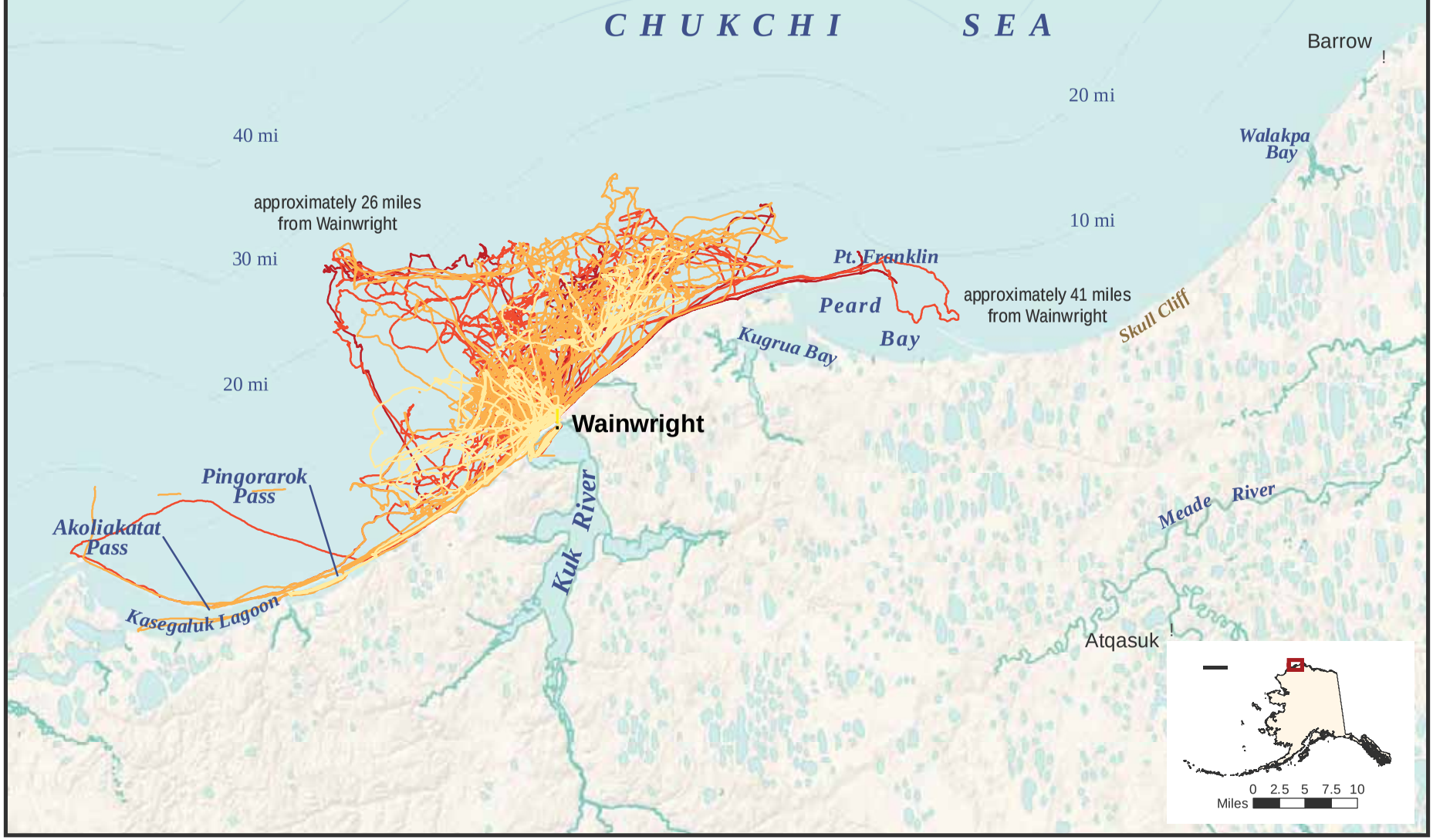


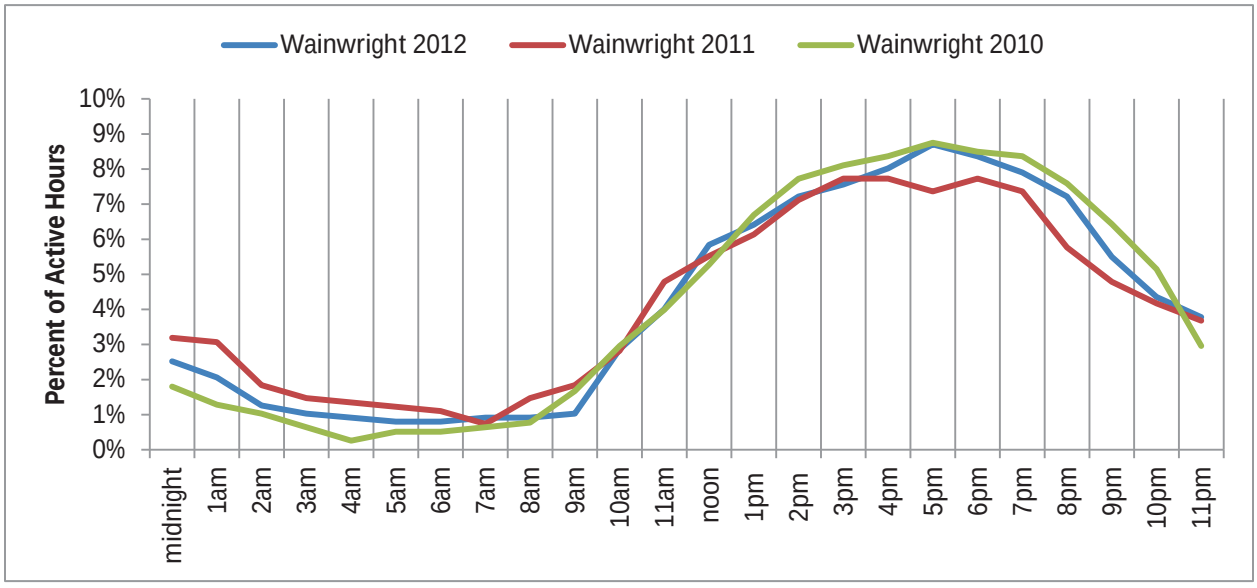
Table 16: Wainwright Period During Day of Departure

Hunting Activity Trip Time	Departure Time			Return Time		
	2010	2011	2012	2010	2011	2012
midnight - 6:00 a.m.	4 (4%)	2 (2%)	3 (2%)	13 (13%)	25 (21%)	17 (13%)
6:00 a.m. - noon	32 (32%)	43 (39%)	34 (28%)	3 (3%)	11 (9%)	11 (8%)
noon - 6:00 p.m.	46 (46%)	42 (38%)	62 (50%)	21 (21%)	24 (20%)	26 (20%)
6:00 p.m. - midnight	18 (18%)	24 (22%)	24 (20%)	63 (63%)	61 (50%)	78 (59%)
Total	100%	100%	100%	100%	100%	100%
Number of Trips	100	111	123	100	121	132
	Chi-Square p=.103			Chi-Square p=.276		

Stephen R. Braund & Associates, 2013.

Figure 4 displays Wainwright participants' active offshore hunting hours by time of day. All three years show a similar distribution of activity. In general participants reported the most activity between 2:00 p.m. and 8:00 p.m. Approximately 57 percent of active hunting hours occurred during this time period in 2010, 51 percent in 2011, and 55 percent in 2012. During the November 2013 community review meeting, residents indicated that the peak of active hours around 5:00 p.m. corresponds to when most community members get off work. Wainwright participants were least active between the hours of midnight and 8:00 a.m., although 2011 and 2012 data show a slight increase in activity during these hours compared to 2010.

Figure 4: Wainwright Active Offshore Hunting Hours



3.2.5 Number and Composition of Hunting Groups

Table 17 provides a frequency and percentage distribution of the number of trip participants for hunting activity trips from 2010 to 2012. In the majority of cases, participants reported between two and four participants per hunting party (59 percent to 81 percent of trips). Participants rarely went on hunting trips

alone. Solitary trips accounted for just four percent of hunting trips in 2010 and one percent in 2011 and were not reported in 2012. Trips with five or more participants for a hunting party accounted for 38 percent in 2010, 31 percent in 2011, and 19 percent in 2012.

Table 17: Wainwright Number of Trip Participants

Number of Participants	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
1	4 (4%)	1 (1%)	0 (0%)
2	24 (23%)	22 (21%)	34 (26%)
3	23 (22%)	28 (26%)	49 (38%)
4	15 (14%)	22 (21%)	22 (17%)
5-9	19 (17%)	14 (13%)	12 (9%)
10-14	9 (9%)	7 (7%)	4 (3%)
15-19	3 (3%)	7 (7%)	3 (3%)
20 or more	9 (9%)	5 (5%)	5 (4%)
Total	100%	100%	100%
Number of Trips	105	106	129

Stephen R. Braund & Associates, 2013.

Table 18 provides a frequency distribution of hunting party composition by each participant's relationship to the participant for the study years. Other relatives were the most frequently mentioned trip participant and often included cousins and uncles. Participant's children were the second most frequent trip participant in 2010 and 2011; although this changed in 2012 with spouse or significant others becoming the second most frequent trip participant. Siblings followed by friends and other individuals were the least common trip participants.

Table 18: Wainwright Composition of Boat Crew by Relationship

Relationship to Participant	Number of Individuals 2010	Number of Individuals 2011	Number of Individuals 2012
Other Relative	164	172	183
Child	34	34	13
Sibling	26	14	14
Spouse or Significant Other	17	19	25
Other	20	8	17

Stephen R. Braund & Associates, 2013.

Table 19 provides a frequency and percentage distribution of the number of males and females on each of the reported hunting trips. Participants reported sizable variation in the number of males in each boat's crew for both years ranging between one to five males per boat. In all three study years, the largest percentage of trips had two males present followed by trips with three males present. The number of trips with four males present declined in 2012 from 27 percent in the previous study years to only nine percent. This is likely attributed to the lack of fall bowhead whale hunting in which participants often reported four male participants. Participants reported that there were no females present on approximately two-thirds of trips during all study years. The percent of trips with at one female present in the boat increased

in each study year (26 to 36 percent). It was relatively uncommon for two or more females to be present in a boat in any of the study years.

Table 19: Wainwright Number of Males and Females in Boat Crew

	Males			Females		
Number	2010	2011	2012	2010	2011	2012
0	0 (0%)	0 (0%)	0 (0%)	83 (69%)	77 (65%)	77 (58%)
1	14 (12%)	5 (4%)	13 (10%)	31 (26%)	39 (33%)	48 (36%)
2	41 (34%)	46 (39%)	56 (42%)	6 (5%)	1 (1%)	7 (5%)
3	22 (18%)	34 (29%)	49 (37%)	0 (0%)	1 (1%)	0 (0%)
4	32 (27%)	32 (27%)	12 (9%)	0 (0%)	0 (0%)	0 (0%)
5	11 (9%)	1 (1%)	2 (2%)	0 (0%)	0 (0%)	0 (0%)
Total	100%	100%	100%	100%	100%	100%
Number of Trips	120	118	132	120	118	132
Chi-Square Males p=.000; Chi-Square Females p=.145						

Stephen R. Braund & Associates, 2013.

Table 20 provides a summary of hunting party composition by male/female across all trips for the study years. At least one male was present on 100 percent of hunting trips. At least one female was present on 31 percent of trips in 2010, 35 percent of hunting trips in 2011, and 41 percent in 2012.

Table 20: Wainwright Composition of Boat Crew

	Percent of Hunting Activity Trips		
	2010	2011	2012
Male	100%	100%	100%
Female	31%	35%	41%

Stephen R. Braund & Associates, 2013.

3.2.6 Estimated Costs per Trip

Table 21 and Figure 5 provides a frequency and percentage distribution of total cost for hunting activity trips. In general, these trips are relatively of short duration focused on day or overnight trips during weather and ice windows. Costs are related to direct trip expenses and do not include capital costs. While the price of individual trips varied between $0.00 and $2,500.00, 34 percent of trips (2010) to 22 percent (2012) cost less than $100.00. A similar percentage of trips (34-36 percent) cost between $100.00 and $200.00. Participants reported that 28 to 34 percent of trips cost $200.00 or more during the three study years. Two percent of trips in 2010 and 2012 cost more than $1000.00. Trips with the highest costs were those in which supplies were purchased for the season and attributed to one trip (e.g., gear and ammunition), had high "other" costs such as replacing a prop or buying floats, or had high gasoline costs. In general, costs associated with bowhead whaling trips were the highest per trip; costs associated with trips for other marine mammals were less.

Table 21: Wainwright Total Cost by Trip

Total Cost	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
No cost	4 (3%)	10 (9%)	11 (8%)
$1-99	40 (34%)	29 (25%)	29 (22%)
$100-199	42 (35%)	42 (36%)	45 (34%)
$200-299	14 (12%)	19 (16%)	20 (15%)
$300-399	7 (6%)	14 (12%)	11 (8%)
$400-499	5 (4%)	2 (2%)	5 (4%)
$500-999	5 (4%)	1 (1%)	7 (5%)
$1,000 or more	2 (2%)	0 (0%)	3 (2%)
Total	100%	100%	100%
Number of Trips	119	117	131
Chi-Square p=.058			

Stephen R. Braund & Associates, 2013.

Figure 5: Wainwright Total Costs by Trip

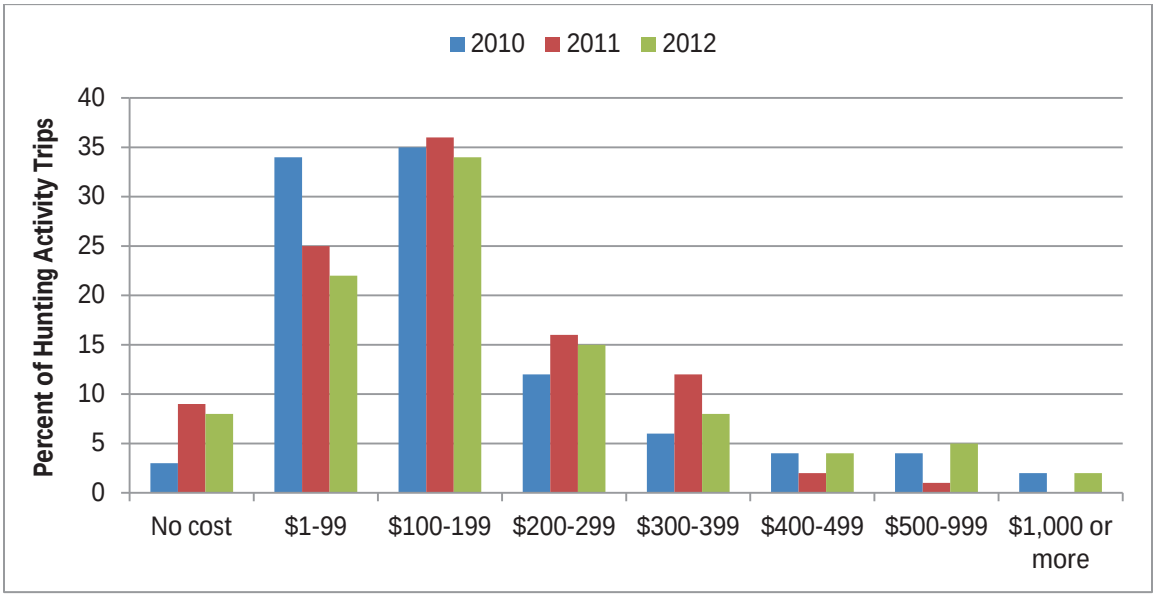


Table 22 provides average (mean) trip cost for hunting activity trips. The average total cost of a hunting activity trip in 2010 was $191.00, with $104.00 spent on gasoline, $25.00 on ammunition, $38.00 on food, and $11.00 on other costs. In 2011, the average cost of a hunting trip declined to $153.00; much of the decline was reported in ammunition. Participants spent an average of $108.00 on gasoline, $7.00 on ammunition, $35.00 on food, and $9.00 on other costs in 2011. Average costs in 2012 were the highest of the three study years at $213.00 a trip. All categories in 2012 cost more on average than the previous two years with the greatest increase reported in food costs at $61.00 per trip.

Table 22: Wainwright Average Trip Costs

Year	Gasoline	Ammunition	Food	Other Costs	Total Costs
2010	$104	$25	$38	$11	$191
2011	$108	$7	$35	$9	$153
2012	$113	$30	$61	$16	$213
ANOVA p=	0.136	0.682	0.004	0.092	0.23

Stephen R. Braund & Associates, 2013.

Table 23 provides a frequency and percentage distribution of hunting activity trips by cost range. Fuel costs ranged from no cost to $100.00 or more per boating trip. In the case of no fuel costs, the participant either traveled with another person or had already purchased fuel during a previous trip. SRB&A also distributed half a drum of fuel (27.5 gallons) to participants as a fuel honoraria that could have been used during offshore trips. The other half drum of fuel was distributed at the end of the field season. Approximately half (46 percent) of trips in both years cost $100.00 or more in fuel, and half of trips (54 percent) cost less than $100.00. The distribution of fuel costs per trip was similar for all three years.

In the majority of cases participants reported that they already had whatever ammunition they needed prior to departing on a hunting trip (Table 23) and this was especially the case in 2011. This is reflected by the fact that participants spent no money on ammunition for 63 percent of trips in 2010 and 2012, and no money on ammunition for 83 percent of trips in 2011. In cases where participants did report purchasing ammunition, the most frequently reported costs were between $25.00 and $49.00 for all three years.

Food expenditures per trip were similar for 2010 and 2011. Fifty-one percent of trips in 2010 and 46 percent of trips in 2011 had no associated food costs; the number of trips with no food costs decreased in 2012 to 37 percent. In these cases, participants typically reported that they brought food they already had in stock for these trips. Approximately 25 percent of trips with associated food purchases were reported to cost between $25.00 and $75.00 during 2010 and 2011 and increased to 41 percent in 2012. In the three study years, between 10 and 20 percent of trips had associated food costs between $100.00 and $200.00.

Participants were asked if they purchased any other supplies prior to embarking on a hunting trip (Table 23). Over three quarters of trips had no additional supply costs. In cases where participants reported that a trip had additional supply costs, they most commonly reported buying either cigarettes, oil for their boats, or parts to repair their boats.

As noted in the preceding paragraphs, the participants did not account for items that were not purchased for a specific trip (i.e., ammunition and food in hand), and thus these items were assigned a cost of $0.00. This is another reason why the reported costs per trip are lower than the actual costs.

Table 23: Wainwright Hunting Activity Costs by Item

Costs	Percent of Hunting Activity Trips											
	Fuel			Ammunition			Food			Other Costs		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
No cost	5 (4%)	10 (9%)	12 (9%)	71 (63%)	93 (83%)	76 (63%)	57 (51%)	51 (46%)	45 (37%)	81 (76%)	90 (82%)	97 (75%)
Under $25	10 (8%)	3 (3%)	3 (2%)	7 (6%)	3 (3%)	11 (9%)	4 (4%)	9 (8%)	8 (7%)	11 (10%)	6 (5%)	14 (11%)
$25-49	15 (13%)	14 (12%)	18 (14%)	16 (14%)	10 (9%)	14 (12%)	15 (13%)	13 (12%)	28 (23%)	8 (8%)	4 (4%)	8 (6%)
$50-74	13 (11%)	14 (12%)	17 (13%)	6 (5%)	4 (4%)	8 (7%)	15 (13%)	13 (12%)	19 (16%)	2 (2%)	10 (9%)	4 (3%)
$75-99	21 (18%)	12 (10%)	9 (7%)	1 (1%)	1 (1%)	0 (0%)	1 (1%)	2 (2%)	2 (2%)	3 (3%)	0%	0 (0%)
$100-$199	43 (36%)	49 (43%)	55 (42%)	9 (8%)	1 (1%)	7 (6%)	17 (15%)	22 (20%)	12 (10%)	1 (1%)	1 (1%)	6 (5%)
$200-299	6 (5%)	10 (9%)	9 (7%)	1 (1%)	0%	3 (2%)	3 (3%)	0%	3 (2%)	0%	0%	0 (0%)
$300-399	2 (2%)	1 (1%)	4 (3%)	1 (1%)	0%	1 (1%)	0%	0%	1 (1%)	0%	0%	1 (1%)
$400-499	1 (1%)	1 (1%)	3 (2%)	0%	0%	0 (0%)	0%	0%	0 (0%)	0%	0%	0 (0%)
$500-999	2 (2%)	0%	1 (1%)	0%	0%	1 (1%)	1 (1%)	0%	1 (1%)	0%	0%	0 (0%)
$1,000 or more	0%	0%	0 (0%)	0%	0%	0 (0%)	0%	0%	2 (2%)	0%	0%	0 (0%)
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of Trips	119	115	131	112	112	121	112	110	121	106	110	130
	Chi-Square p=.254			Chi-Square p=.093			Chi-Square p=.144			Chi-Square p=.067		

Stephen R. Braund & Associates, 2013.

3.3 Hunting Conditions

3.3.1 Weather, Ice Conditions, and Sea States

Table 24 provides a frequency and percentage distribution of hunting activity trips by participant reported weather conditions. Participants reported fair conditions at some point during a majority of their boating trips in all three years. In 2010, participants reported taking 49 percent of trips during clear conditions and 13 percent of trips during partly cloudy conditions. In 2010, participants reported overcast conditions during 35 percent of trips, foggy conditions during 12 percent of trips, and precipitation during three percent of trips. Similar to 2010, participants in 2011 and 2012 reported clear conditions the most frequently (37 and 43 percent respectively) followed by overcast, partly cloudy, foggy, and precipitation conditions.

Table 24: Wainwright Reported Weather Conditions on Hunting Trips

Reported Weather Conditions	Percent of Hunting Activity Trips			
	2010	2011	2012	Chi-Square P
Clear	58 (49%)	42 (37%)	56 (43%)	0.205
Overcast	42 (35%)	38 (34%)	39 (30%)	0.660
Partly Cloudy	16 (13%)	35 (31%)	29 (22%)	0.006
Foggy	14(12%)	11 (10%)	19 (11%)	0.503
Precipitation	4 (3%)	12 (11%)	5 (4%)	0.039
Number of Trips	119	113	130	

Stephen R. Braund & Associates, 2013.

Map 51 through Map 53 show the extent of hunting trips during three different ocean ice conditions: open ice, open water, and ice free. Table 25 provides a frequency and percentage distribution for reported ice conditions during hunting trips.

Table 25: Wainwright Reported Ice Conditions on Hunting Trips

Reported Ice Conditions	Percent of Hunting Activity Trips		
	2010	2011	2012
Ice free	58 (48%)	36 (31%)	16 (12%)
Open water	11 (9%)	57 (48%)	54 (41%)
Open ice	51 (43%)	25 (21%)	62 (47%)
Total	100%	100%	100%
Number of Trips	120	118	132
Chi-Square p=.000			

Stephen R. Braund & Associates, 2013.

Map 51: Hunting Trips During Open Ice, Open Water, and Ice Free Conditions, Wainwright 2010

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! study community

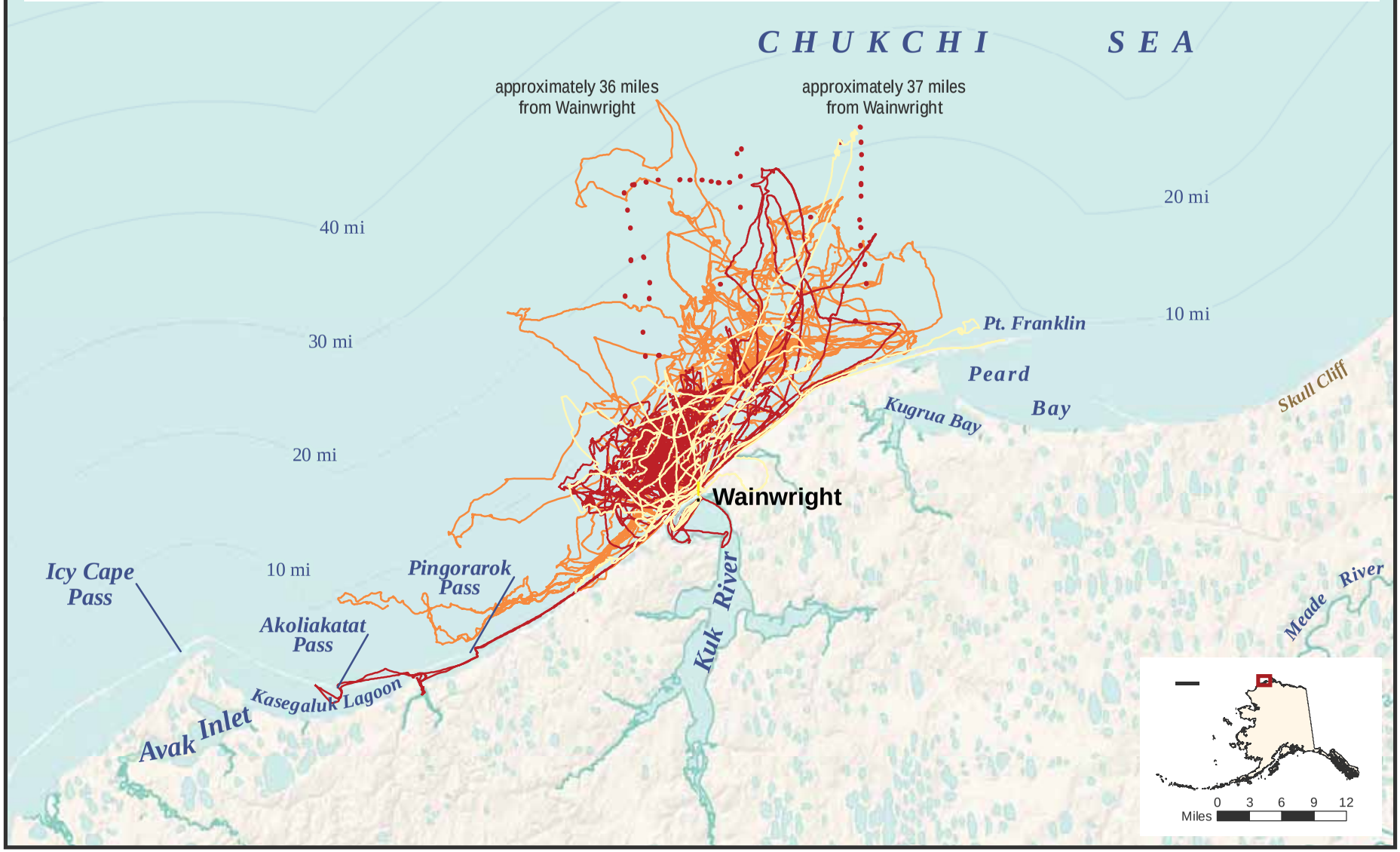
— open ice (many leads and floes not in contact) March thru July —

open water (no shore fast ice and some floating ice) May, June, July

— ice free conditions, July, September and October —

109 boat tracks representing 118 hunting trips, 16 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 52: Hunting Trips During Open Ice, Open Water, and Ice Free Conditions, Wainwright 2011

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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

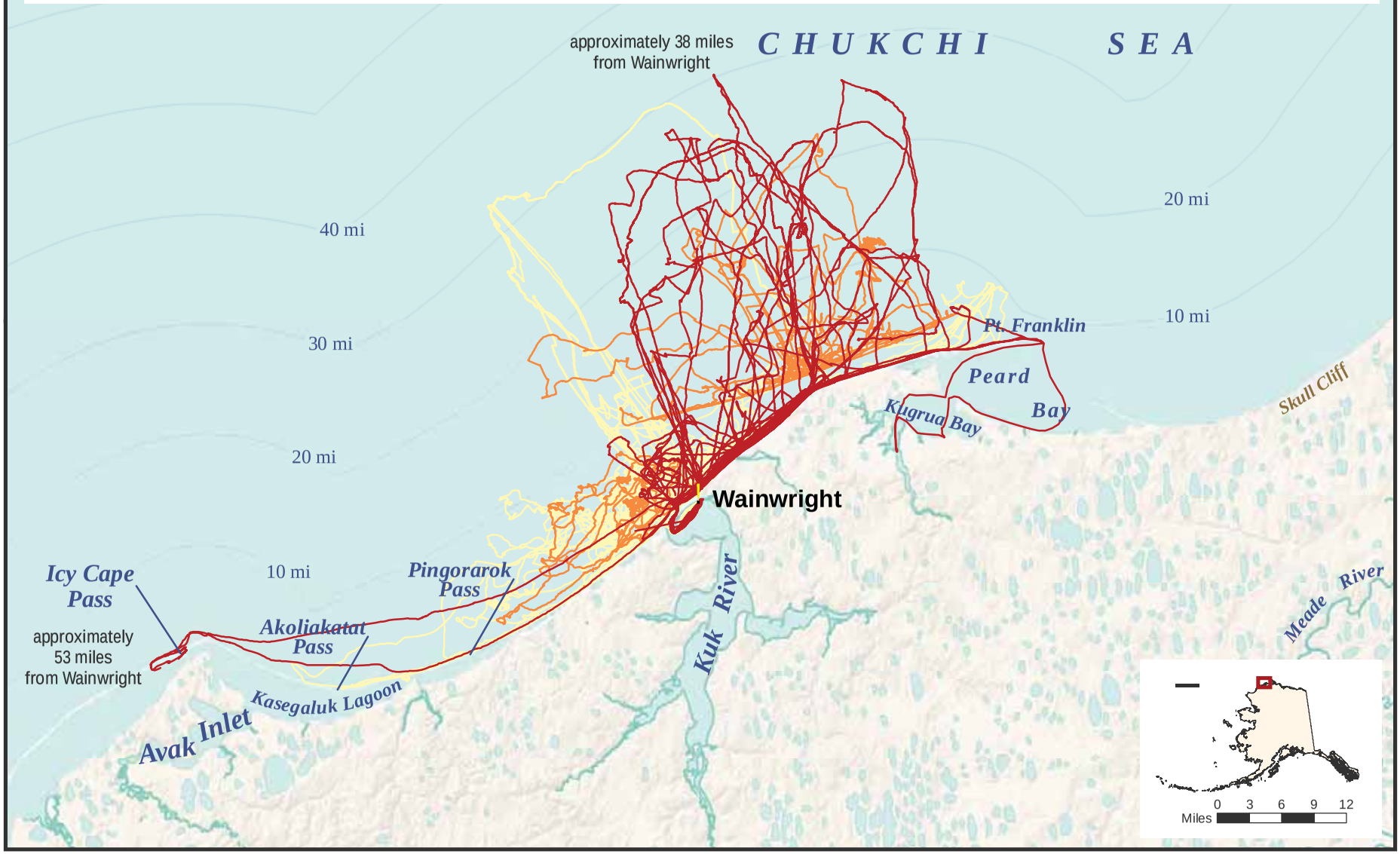
— open ice (many leads and floes not in contact) April-August —

open water (no shore fast ice and some floating ice) June, July, October

— ice free conditions, July-October —

108 boat tracks representing 118 hunting trips, 20 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 53: Hunting Trips During Open Ice, Open Water, and Ice Free Conditions, Wainwright 2012

Stephen R. Braund & Associates
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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

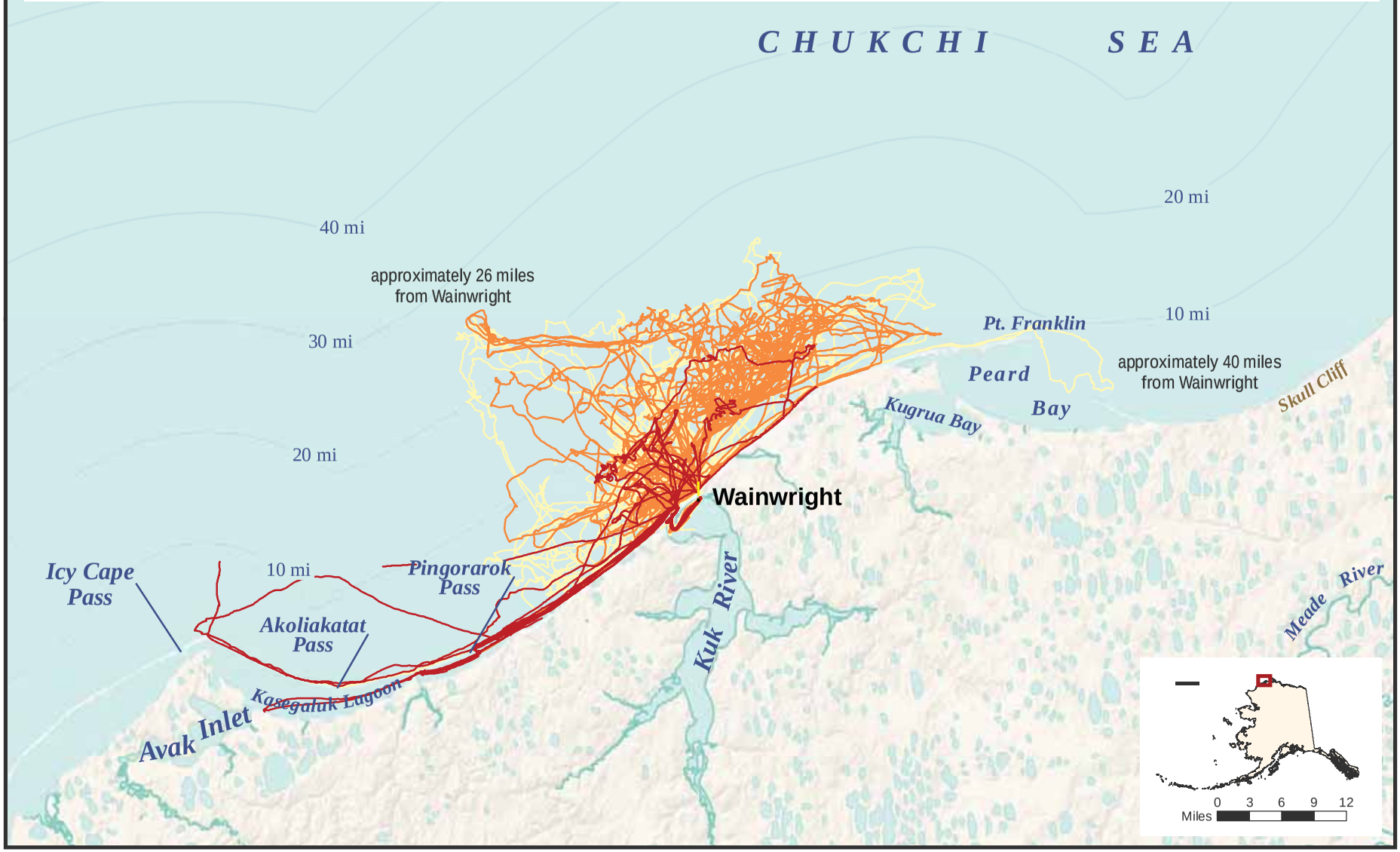
— open ice (many leads and floes not in contact) April thru July —

open water (no shore fast ice and some floating ice) May thru July

— ice free conditions, June thru September —

125 boat tracks representing 132 hunting trips, 16 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



In 2010, participants reported ice free conditions for 48 percent of trips (Table 25) (see Section 2.6.2 for study definitions of ice conditions). Open water conditions were present for nine percent of trips, and open ice conditions were present for 43 percent of trips. GPS tracks indicate that in 2010 participants traveled farther offshore from Wainwright during open ice conditions than during ice free or open water conditions (Map 51). Ice free conditions may allow hunters to travel great distances from Wainwright provided the sea is calm and winds are light, although hunting activities during this time are often focused along the coast. Floating ice provides important habitat for bearded seals and walruses, making it easier for hunters to harvest and process them while those large marine mammals are on the floating ice; it can also constitute a boating hazard that can impede travel, particularly when there is a lot of ice present in the ocean. While hunters commonly target seals and walrus during open water conditions (i.e., on floating/broken ice), participants indicated that 2010 was a somewhat abnormal year for ice conditions. Participants reported that both the shorefast ice and the floating ice went out early and did not return for the duration of the season.

In 2011, participants reported ice free conditions for 31 percent of trips (Table 25). Open water conditions were present for 48 percent of trips, and open ice conditions were present for 21 percent of trips. The increase in the number of open water trips (11 to 57) reflects participants' observations that sea ice was present on the ocean for a much longer period in 2011 than in 2010. GPS tracks from 2011 show that participants traveled farthest from Wainwright during ice free and open water conditions (Map 52). Calmer winds in 2011 allowed participants to travel farther offshore during ice free conditions than they did in 2010. Though participants did not travel as far offshore during open ice conditions as they did when there was open water or no ice present in the ocean, they still traveled up over 20 miles offshore. Although sea ice can be a boating hazard and impediment, it also acts as a buffer against strong currents and high winds and provides access to large marine mammals that have hauled out onto the ice. Hunters can still travel far from shore during such conditions as long as the conditions remain favorable.

In 2012, participants reported yet another variation in percent of trips conducted during the three ice and water conditions. Participants reported the fewest trips (12 percent) during ice free conditions whereas they had previously reported 31 and 48 percent of trips for the same conditions in the previous two years. Participants said that sea ice lingered close to Wainwright much longer in 2012 than in 2010 or 2011. When the ice did finally go out, high winds and frequent precipitation kept participants from traveling offshore. Thus, hunting activities during open ice conditions were the highest of all three study years at 47 percent of trips. Open ice and open water trips were the farthest trips offshore during the 2012 season (Map 53) although ice free trips were the longest in distance at approximately 40 miles from Wainwright in Peard Bay.

In 2012, participants reported yet another variation in percent of trips conducted during the three ice and water conditions. Participants reported the fewest trips (12 percent) during ice free conditions whereas they had previously reported 31 and 48 percent of trips for the same conditions in the previous two years. Participants said that sea ice lingered close to Wainwright much longer in 2012 than in 2010 or 2011. When the ice did finally go out, high winds and frequent precipitation kept participants from traveling offshore. Thus, hunting activities during open ice conditions were the highest of all three study years at 47 percent of trips. Open ice and open water trips were the farthest trips offshore during the 2012 season (Map 53) although ice free trips were the longest in distance at approximately 40 miles from Wainwright in Peard Bay.

In general, GPS tracks from the three study years do not provide a clear pattern regarding distance traveled and/or area covered related to ice conditions (Map 51, Map 52, and Map 53). In 2010, open ice tracks were the farthest offshore and most dispersed; in 2011, ice free tracks were the farthest from shore and most dispersed; in 2012, open water and open ice tracks were the farthest offshore and covered similar extents. As noted above, ice free conditions allow hunters to travel great distances from Wainwright if the sea is calm and winds are light, although hunting activities during this time (August and September) are often focused along the coast or inland for fish and caribou and because many of the

marine mammals have moved out with the receding ice. Thus, trips during ice free conditions rarely extend far offshore except during fall bowhead whaling.

Table 26 provides a frequency and percentage distribution for hunter reported wind speeds during hunting trips. Participants generally preferred hunting when the wind conditions were calm or light, but went boating more often in elevated wind conditions in 2011 than in 2010 or 2012.

Table 26: Wainwright Reported Average Wind Speed on Hunting Trips

Wind Speed	Percent of Hunting Activity Trips		
	2010	2011	2012
Calm	30 (31%)	18 (16%)	38 (29%)
Less than 10mph	19 (20%)	23 (20%)	43 (33%)
10-14mph	27 (28%)	38 (33%)	27 (21%)
15-19mph	16 (16%)	27 (24%)	14 (11%)
20 or more mph	5 (5%)	10 (9%)	8 (6%)
Total	100%	100%	100%
Number of Trips	97	116	130
Chi-Square p=.004			

Stephen R. Braund & Associates, 2013.

Table 27 provides a frequency and percentage distribution of reported wind directions for hunting trips in the three study years. In 2010, participants reported calm conditions (i.e., no wind direction) during 27 percent of trips. Prevailing wind conditions at Wainwright are generally out of the east (Western Regional Climate Center n.d.). When wind was present during a trip, participants reported the prevailing winds came from the northeast (26 percent) and east (26 percent). Participants reported north winds during 12 percent of trips. Participants reported winds from other directions during 10 percent of trips.

In 2011, participants reported calm conditions (i.e., no wind direction) during 16 percent of trips. When wind was present during a trip, participants reported northeast or north northeast winds during 37 percent of trips and east winds during 21 percent of trips. Participants reported north winds during 12 percent of trips. Participants reported winds from other directions during 14 percent of trips.

In 2012, calm conditions were reported for 30 percent of trips, the highest of the three study years. Similar to previous years, project participants reported the next greatest number of trips associated with east and northeast wind directions. Unlike previous years, wind from the west was reported during 13 percent of hunting trips as compared to one percent in 2010 and zero trips in 2011.

Table 27: Wainwright Reported Wind Direction on Hunting Trips

Wind Direction	Percent of Hunting Activity Trips		
	2010	2011	2012
Calm	29 (27%)	19 (16%)	38 (30%)
North	13 (12%)	14 (12%)	10 (8%)
North Northeast	0 (0%)	8 (7%)	0 (0%)
Northeast	28 (26%)	35 (30%)	22 (17%)
East	28 (26%)	24 (21%)	18 (14%)
Southeast	0 (0%)	0 (0%)	6 (5%)

Wind Direction	Percent of Hunting Activity Trips		
	2010	2011	2012
South	2 (2%)	2 (2%)	4 (3%)
South Southwest	2 (2%)	3 (3%)	1 (1%)
Southwest	1 (1%)	1 (1%)	6 (5%)
West	1 (1%)	0 (0%)	17 (13%)
North Northwest	0 (0%)	2 (2%)	0 (0%)
Northwest	4 (4%)	7 (6%)	4 (3%)
Total	100%	100%	100%
Number of Trips	108	116	126
Chi-Square p=.000			

Stephen R. Braund & Associates, 2013.

Table 28 provides a frequency and percentage distribution of the reported water condition during each hunting trip. In some instances, participants reported more than one type of water condition on a given trip (see Section 2.6.2 for study definitions of water conditions). For example, participants could have reported departing during calm conditions but having to return earlier than planned because they encountered rough conditions later in the trip. Participants preferred to go boating under calm water conditions during all study years. Participants reported calm conditions from 52 to 74 percent of trips. Choppy conditions were present during 28 to 46 percent of trips. Participants reported rough conditions during 17 percent of trips in 2010, eight percent of trips in 2011, and five percent in 2012.

Table 28: Wainwright Reported Condition of Water on Hunting Trips

Water Condition	Percent of Hunting Activity Trips		
	2010	2011	2012
Calm	63 (57%)	61 (52%)	96 (74%)
Choppy	38 (34%)	54 (46%)	37 (28)%
Rough	19 (17%)	10 (9%)	7 (5%)
Number of Trips	111	117	132
Chi-Square p=.006			

Stephen R. Braund & Associates, 2013.

Table 29 provides a frequency and percentage distribution of answers to the question, "Did the weather influence your trip?" for all study years. In 2010, participants reported that weather influenced their trip in some way (either positively or negatively) in 39 percent of cases. In 2011, participants reported that weather influenced their trip in some way in 49 percent of cases. Weather influences the fewest number of trips in 2012 (31 percent). Residents described weather influences on hunting trips for each of the study years. The most commonly reported weather influence was wind and accompanying waves. Individuals described the influence of the wind on their offshore hunting activities; in some cases participants reported having to limit their harvest or remove the whaling camp they had set up on shorefast ice because of the potential threat that increased winds posed:

> *It was pretty good when we first take off. The wind changed from the south. Right after we got our* ugruk *[bearded seal] they called us from Wainwright. The wind is picking up. The wind changed from calm to southwest and the wind was picking up. More choppier.*

The waves were kind of big. Four feet maybe. Three feet. We had to go all the way around [through the inlet on the way back] because it was too choppy. (Wainwright Hunter Observation 2012)

Picked up to 15 to 20 knots. The forecast was 30 to 35 knots but it never did hit us. That's what made us go home -- thinking it was going to hit us. (Wainwright Hunter Observation 2011)

Because of the fact that we were out in the open ocean [the wind influenced our hunt]. People have died because of it. The wind did have an effect on the hunt. Because of the wind my uncle said two [walrus] is enough. (Wainwright Hunter Observation 2011)

Broke camp due to deteriorating wind conditions. (Wainwright Hunter Observation 2010)

Ice conditions were noted as influencing a number of trips as well. Often a strong west wind in combination with advancing ice was cited as influencing residents offshore harvest activities. One individual described several hunters needing rescue due to the combination of strong west wind and moving ice saying,

The ocean currents did. The ice is coming in from the south and it's closing the ocean up so it kept us-in the back of our mind, are we going to make it home or not. The ice will close up and you'll have no more water and you'll be stuck out there. That five knot west wind pushed the ice enough to close the water. That's why those guys called for help. (Wainwright Hunter Observation 2012)

Several people also mentioned that the formation of young ice hindered residents travel and influenced their hunt.

Participants noted that favorable visibility helped hunters to see seals and positively influenced the hunt. Others noted fog and poor visibility and precipitation made it more difficult to hunt. One individual described the appearance of fog during a bowhead hunt almost cost the crew their chance for a successful harvest saying, "We lost a whale for a while because it got foggy but when it cleared up we caught it again" (Wainwright Hunter Observation 2011). Strong currents were also mentioned by participants as influencing their hunt, particularly the beluga hunt, and the ability of the hunters to herd beluga into the inlet.

Table 29: Wainwright - Did Weather Influence Hunting Trip

	Percent of Hunting Activity Trips		
Weather Influence Hunt?	2010	2011	2012
No	74 (61%)	60 (51%)	91 (69%)
Yes	47 (39%)	58 (49%)	41 (31%)
Total	100%	100%	100%
Number of Trips	121	118	132
Chi-Square p = .014			

3.3.2 Trip Safety and Access

Table 30 provides a frequency and percentage distribution of answers to six safety and access questions for the three study years. Participants reported that they had difficulty accessing their intended hunting area in 11 to 15 percent of trips during the three study years. In 2010 and 2011 participants cited strong winds and rough seas as the most frequent causes. As one participant described, "Launching the boat was a problem. Launching off the beach with the swells was a problem. Coming in too" (Wainwright Hunter Observation 2010).

Table 30: Wainwright Percentage of Trips with Safety/Access Issues

	Percent of Hunting Activity Trips			
Safety/Access Issues	2010	2011	2012	Chi-Square p=
Did you have any difficulty accessing the hunting area?	17 (14%)	18 (15%)	15 (11%)	0.651
Did anything make your hunting trip less safe?	19 (16%)	22 (19%)	16 (12%)	0.358
Were there any accidents or mishaps on your trip?	5 (4%)	5 (4%)	2 (2%)	0.38
Did you travel farther than usual?	16 (13%)	17 (14%)	14 (11%)	0.649
Did your hunting trip cost more than usual?	17 (14%)	16 (14%)	18 (14%)	0.993
Did any meat spoil?	2 (2%)	1 (1%)	4 (3%)	0.437
Number of Trips	121	118	132	

Stephen R. Braund & Associates, 2013.

Another participant relayed a story of rough ocean conditions influencing his October hunting activity. He said,

> *There was a spot right in here [pointed to a part of the chart approximately 20 miles from shore] that was the choppiest. We just boated to a part where it was smoother. We drove slowly through it until we got to where it was a little smoother. It wasn't my boat so I wasn't going to beat the boat up. I know why some of the guys were telling me that they had never gone that far out at that time of year….. It was all a new experience being out that far in October. I've been out that far in the summer.* (Wainwright Hunter Observation 2011)

In 2012, participants continued to cite strong winds and seas but also had a number of comments related to ice and fog making it difficult to access their hunting areas. Three individuals briefly described these conditions as follows:

> *There was ice. The ice was moving and the wind was coming from the west.* (Wainwright Hunter Observation 2012)

> *We couldn't go out where I wanted to go out because of the fog and the ice. That was kind of frustrating, and I told you the GPS started acting up. I had to hold it a certain way.* (Wainwright Hunter Observation 2012)

Young ice interfered with the hunt so we came back on the land. (Wainwright Hunter Observation 2012)

Participants reported a slightly higher range of trips in which they reported something happened to make the trip less safe (12 to 19 percent). Similar conditions to those that made accessing hunting areas difficult (e.g., strong winds, rough seas, and multi-year and young ice conditions) were the most frequently reported boating hazards during the three study years. One individual described the potential hazards that boat crews face from both the young ice (*siquliaq)* and multiyear ice. He said,

I think it would be siquliaq-*young ice forming. You have to boat over it. It would be [hazardous] if the current would reach the shore. It would pile up. That would make it dangerous. It was always a thought on our minds.* (Wainwright Hunter Observation 2012)

The ice. The big ice out there. It was multiyear ice out there. If that had come in while we were out there we could have been blocked. It did influence us. I made a judgment factor for how long we would be out there. Safety factor. (Wainwright Hunter Observation 2012)

A few participants also reported the presence of young children on their boat as a potential safety concern.

Despite the number of trips in which access was made difficult or conditions became unsafe, Wainwright participants reported few accidents or mishaps during the three study years with accidents occurring on only four percent of trips in 2010 and 2011 and two percent of trips in 2012. Participants provided a broad range of examples from cut or injured fingers to potentially more serious mishaps such as leaking or damaged boats, broken equipment, and an unexploded whaling bomb that required dismantling. Participants described these experiences saying,

I've got to buy me a new VHF. That boating trip messed mine up. On my outboard we had two to three inches of ice [in October]. It was amazing those guys survived that. We couldn't hear them. The other boat was relaying for them. (Wainwright Hunter Observation 2011)

There was one mishap where a boat had tethered his rope too long and they hit a wave and they almost went up over another boat. (Wainwright Hunter Observation 2010)

Our bomb didn't go off from the harpoon. It could have been [a danger to the crew] but we got it out of there and dismantled it. (Wainwright Hunter Observation 2012)

Participants were asked if they had to travel farther than usual during their 2010 through 2012 boating season. They reported traveling farther on 11 to 14 percent of trips. In nearly all cases, participants traveled farther than usual while scouting for whales, walruses, and seals. Farther trips associated with walrus and seal hunting usually attributed the greater distance traveled to lack of nearby ice:

We had no choice because the only ice was up there. (Wainwright Hunter Observation 2011)

When the ice sticks around here I usually stick around here and hunt but I went out ten miles where the ice is. (Wainwright Hunter Observation 2012)

Residents also described several trips in which they traveled farther in search of bowhead whales. One person described an event in which they believed they had to travel farther in search of whales because a Coast Guard boat had diverted the route of the bowhead whale. This person said,

We thought we might see whales out there a little farther than last year. I thought they might be taking another route. Like on the first trip I think they spotted that Coast Guard. They were on that route of the whale from last year. I called around the guys at the

> *Comm[unication] Center in Barrow and AEWC. The ship was on the route of the fall whale.* (Wainwright Hunter Observation 2011)

In all three study years, participants reported 14 percent of trips in which individuals spent more than usual. Longer boating trips caused hunters to spend more money, primarily on fuel supplies. Increasing gas prices and the cost of replacement parts were also given as reasons for increased expenses. Describing increased costs from traveling farther in addition to overall rising gas prices three participants said,

> *Yeah because gas costs a lot. We live paycheck to paycheck. We try to get what we need for the winter. I need a couple more bearded seals.* (Wainwright Hunter Observation 2011)

> *All my hunting trips, yeah. It's pretty expensive. I'm usually stocking up on gas but this year it's hard for me to buy gas since I'm on unemployment.* (Wainwright Hunter Observation 2010)

> *Yeah for the fall hunt because we had to go from the beach here instead of going out from the ice lead. We used more gas that day than any other hunts.* (Wainwright Hunter Observation 2012)

The price for a gallon of gas in Wainwright averaged approximately $7.00 per gallon in 2012. While most participants commented on the effects of high gas prices throughout the season, one participant brought the issue up during an end-of-season review. He said that the high price of gasoline in Wainwright was becoming a hardship:

> *Gas got more expensive than last year. That's a headache right there. Seven dollars and some cents a gallon. I was filling up my tank right now and my snowmachine. Seventy dollars, 10 gallons to fill up my snowmachine.* (Wainwright Hunter Observation October 2012)

Few participants reported any incidences of meat spoilage; reasons for meat spoilage included lack of time to process the meat and a whale not being recovered soon enough before the meat spoiled. Observances of meat spoilage ranged from one to three percent of trips during the study years.

3.3.3 Weather and Whaling

As part of ongoing data collection for the project, the study team established weather stations and collected weather data from secondary sources in Wainwright. The study team used the weather station data to allow correlation with hunting events. The following figures compare wind speed during spring and fall whaling periods in Wainwright. The study team defined a whaling event as the continuous blocks of time that were recorded among participants whaling crews' GPSs while engaged in whaling activities.

Figure 6 through Figure 10 graph wind speed across each of Wainwright's five whaling seasons addressed in this report (2010, 2011, and 2012 spring whaling and 2010 and 2011 fall whaling). Orange squares indicate the average wind speed during whaling periods. In most cases, participants preferred to go whaling during periods of relative calm – generally when winds were 10 miles per hour or less.

Participants occasionally went whaling when winds were more than 10 miles per hour, but did not engage in any whaling activities when the average wind speed was more than 20 miles per hour. Except for one whaling event in late fall of 2010, no fall whaling occurred in conditions with average wind speeds over 10 miles per hour. Spring whaling, on the other hand, had a number of whaling events with wind conditions over 10 miles an hour. This difference is likely attributed to the fact that the sea ice in the spring acts as a buffer on rough ocean conditions whereas the fall whaling is conducted in open water with little to no ice and where ocean conditions are more susceptible to higher winds.

Figure 6: 2010 Wainwright Spring Whaling

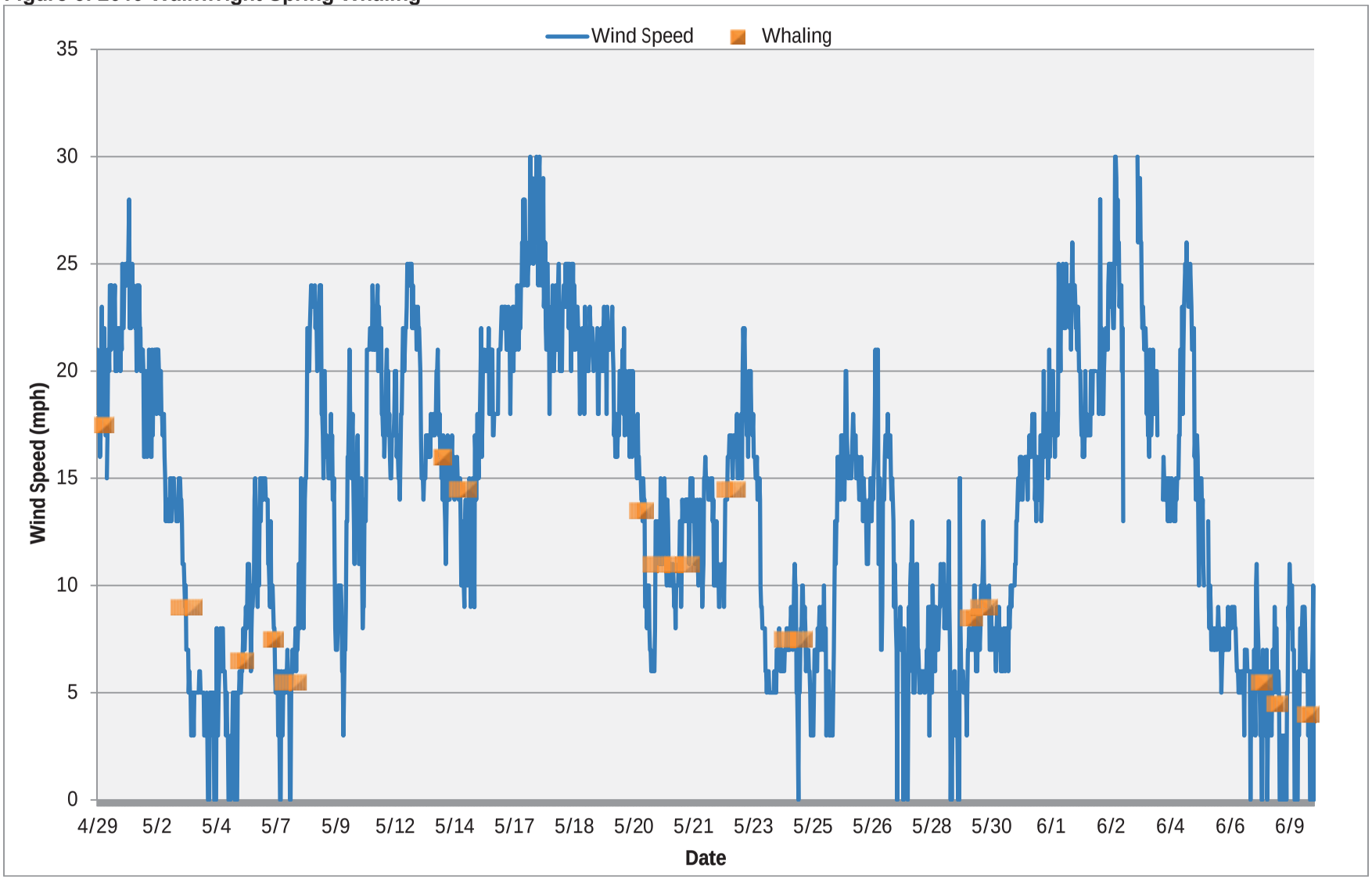


Figure 7: 2010 Wainwright Fall Whaling

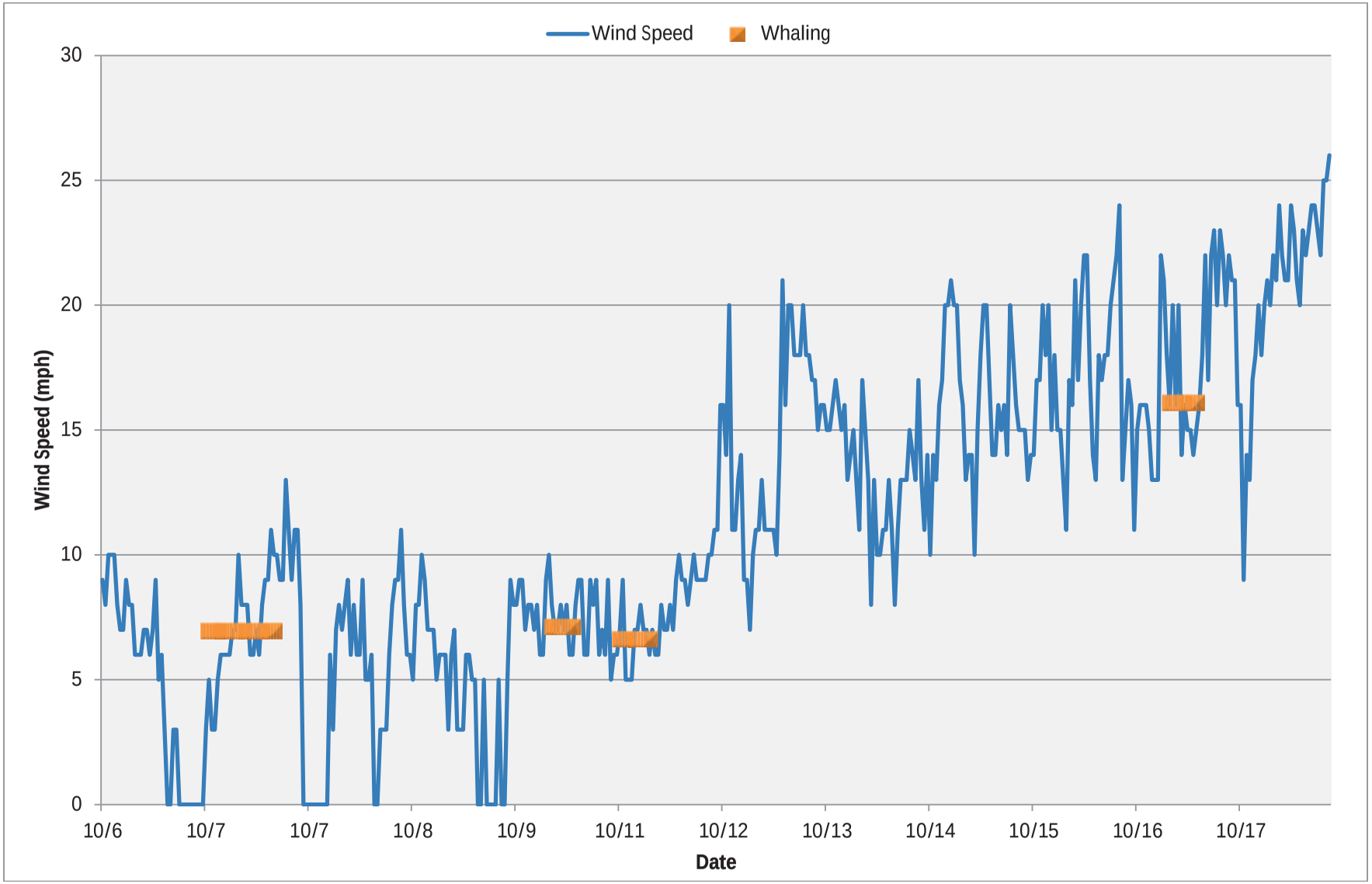


Figure 8: 2011 Wainwright Spring Whaling

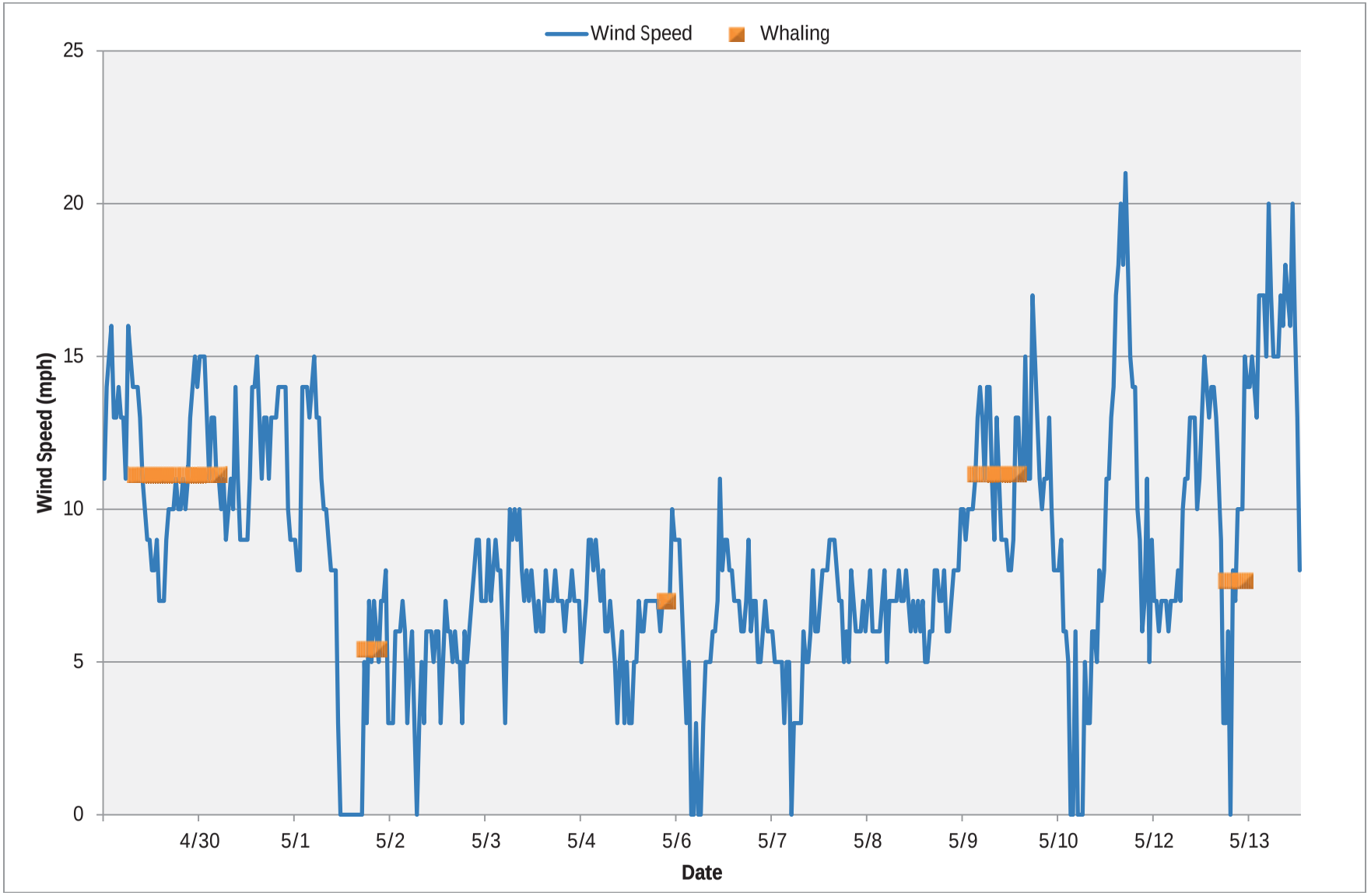


Figure 9: 2011 Wainwright Fall Whaling

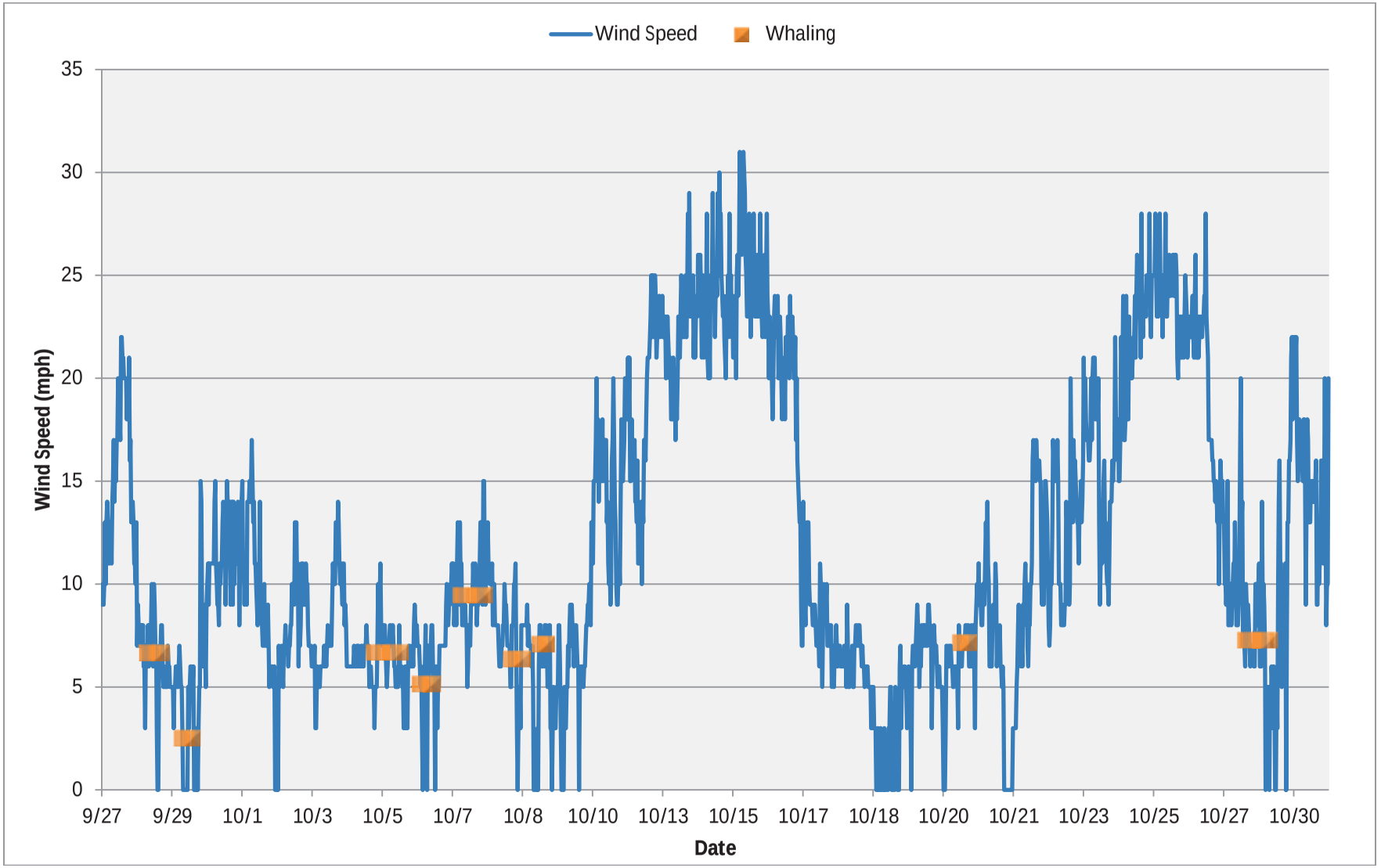
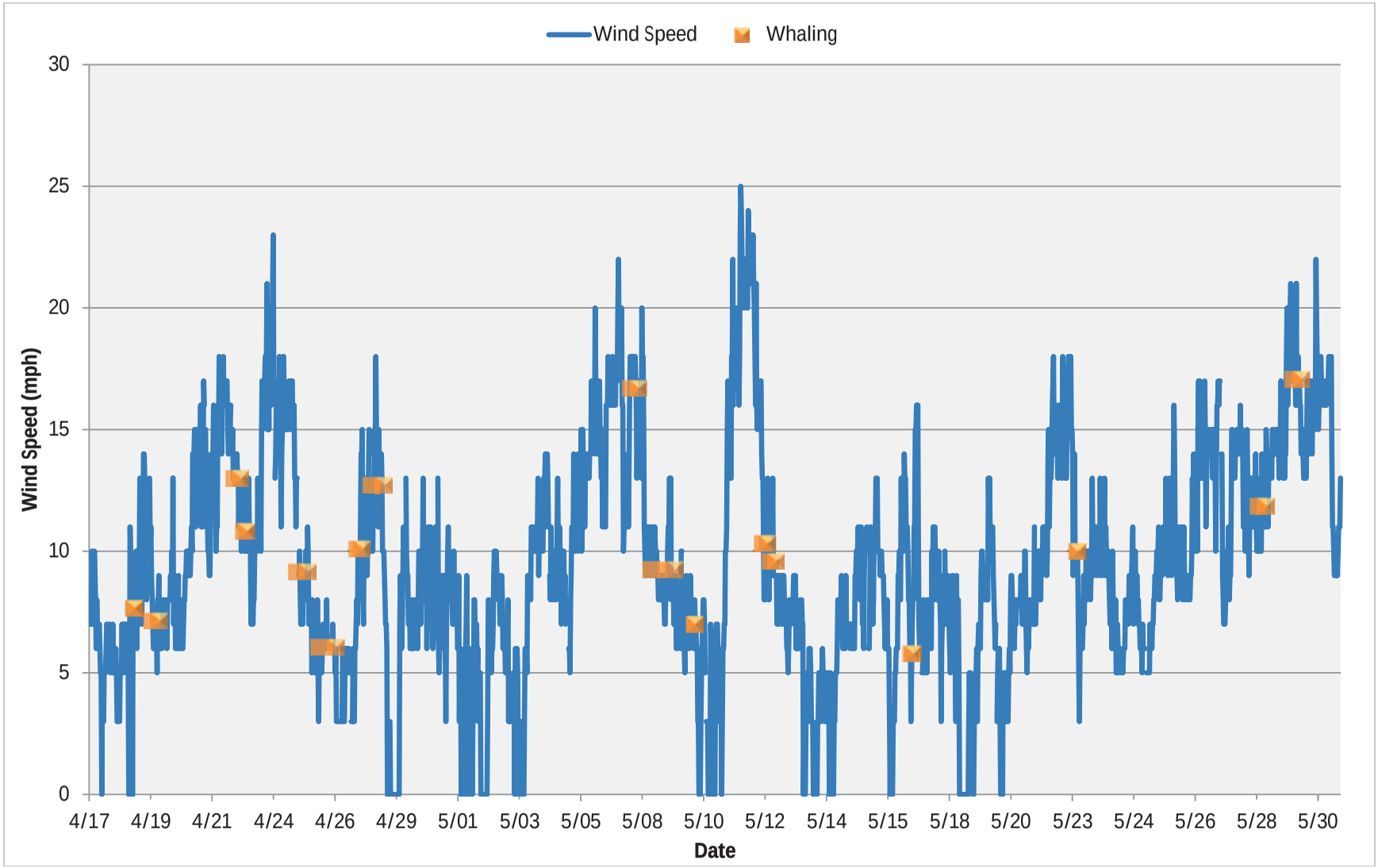


Figure 10: 2012 Wainwright Spring Whaling



3.4 End of 2010 Season Review

In December 2010, the field researcher conducted nine end-of-season reviews in Wainwright. During the first 2011 field trip in March, end-of-season review questions were also asked of participants who were not available in December 2010. The purpose of the end-of-season review was to provide an opportunity for study participants to compare the 2010 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences. The study team also used the end-of-season reviews to determine if any study participants had taken any offshore trips that were not accounted for, noticed any unusual weather or wildlife related observations, to solicit suggestions for subsequent years of the project, and to confirm whether or not they would be willing to participate during the 2011 study year.

3.4.1 Review 2010 Trips and GPS Tracks with Participants

Prior to the December 2010 field trip, the study team tabulated the total number of trips for each Wainwright participant and combined each participant's GPS tracks into a single file. Once in the field, the study team reviewed with each participant how many offshore trips the study team had recorded for that hunter for 2010 and showed each participant his combined GPS track map for the season. Each participant was asked to comment on the accuracy of the offshore trip count and the GPS map.

In most cases, participants indicated that the number of trips recorded was correct and that the map of the participant's tracks looked accurate. Several participants in Wainwright reported that they had forgotten to take their GPS out during the earliest part of the spring whaling season when they were still learning to use them, or that they had used their GPS only to check their location until the field researcher reminded them to keep their GPS on for the duration of offshore trips. In some cases, particularly when a trip had occurred at the beginning of the 2010 boating season, the participant was unable to remember sufficient details from the trip. While the nine Wainwright participants who participated in the end-of-season reviews indicated the number of recorded trips for each individual was correct, these tracks are not representative of the entire community's total amount of offshore subsistence effort. However, during a 2012 community review meeting of Wainwright's 2010 and 2011 hunting tracks, participants did not provide any comments to indicate that the maps were inaccurate.

3.4.2 2010 Boating Season Compared to Previous Seasons

In general, Wainwright participants reported that 2010 was a challenging year for marine mammal harvests. Participants reported that the 2010 boating season was marked by a lack of ice and persistent high winds; both of these factors made boating more difficult and limited the amount of time participants were able to spend offshore, though few residents reported a significant decrease in harvest amounts over previous years. Most participants were able to harvest as many walruses and bearded seals as they needed, as one participant said, "I think it went pretty good. We actually came home with meat and seal oil and walruses, whale, mostly everything we hunt out there" (Wainwright Hunter Observation December 2010). Participants made the following additional comments about the 2010 boating season:

> *For me I think it was a little bit tougher this year, but I was just as successful as I was last year. We had to battle the elements. [We] try to be efficient when we go out there and not goof off.* (Wainwright Hunter Observation December 2010)

> *Last year we were able to get walruses because we were out there early, and the ice didn't blow away. Same with bearded seals. It was the same with last year, but this year the ice blew out earlier.* (Wainwright Hunter Observation December 2010)

Animals were only available during very narrow opportunities because of the weather, the sea state conditions, and the early warming. We not only lost our ocean ice early, we also lost all our beach cover early as well as [losing] all the ice in the inlets early. [There was] no way to really go any farther than 20 miles without dragging a boat with you. But yet the lagoon ice was very thick and did not go out until the middle of July so we couldn't use the boat ramp to launch our heavy boats. All the weather conditions worked against us. We have to adapt to it; it's normal. (Wainwright Hunter Observation March 2011)

When asked about unusual observations in 2010 other than subsistence related observations (see Subsistence Resource Observations below), one participant described the frequency and distribution of offshore vessel activity in 2010. This person reported approximately 40 to 50 vessels passing through the area and that most of the vessels were located more than 20 miles from Wainwright. He said,

I saw more vessels than anybody else did because I can see the track logs, and I know what's going on as far as the observation activities. I'm tracking nine vessels associated with the oil industry, and when I looked at the AIS [automated] radio based tracking system [I saw] 40 to 50 ships that were working out there, from U.S. Navy to Coast Guard to a lot of heavy haul ships heading for Alaska and Canada. Couple cruise ships, light sailing boats. Most of them never came within 20 miles of Wainwright. Unheard and unnoticed. So many times I'd get far out there I'd start seeing them there on the horizon. I'd try to identify it and what in the hell kind of ship is that?

Asked if he had experienced any impacts on his offshore hunting activities from this activity, this person replied, "Not that I can tell, different but normal. I expect every year to be different." (Wainwright Hunter Observation March 2011)

3.4.2.1 Hunting Activities

Harvest Amounts Compared to Past Years. Wainwright participants reported that their 2010 harvest amounts were comparable to other seasons. The community landed two bowhead whales during the spring and harvested the first fall bowhead whale in decades in October. One participant, commenting on the successes of the spring and fall bowhead whale hunt, said,

I think [it was a typical year for whaling]. We got a lot of boating time, which is good, and the whales are there. It's just a matter of, in my opinion, the Lord said you're going only to take two so we only took two, no matter how much we try. The numbers of whales were good; the water was great. The ocean was great during the spring whale hunt. We couldn't ask for a better year. For the fall time [a whaling captain] got a whale in early October. That's a first in about 100 years. (Wainwright Hunter Observation December 2010)

Another participant attributed the successful fall bowhead harvest to a change in fall bowhead whale migration patterns. According to this participant's traditional knowledge, there is an area of upwelling between Wainwright and Barrow that continually brings food to the surface. Bowhead whales use this area to feed in the fall before migrating south. This participant said,

I also made a statement to [community member] when I was working at the Barrow trench about the deep trench that goes from 120 feet in depth to about 800 feet off the continental shelf. When I was there in the middle of summer, I saw seabirds and when I looked in the water there was garbage and sea plants. This area was about 10 miles in diameter. They said this is obviously an upwelling coming up off the trench. [It's a] natural gyre and a gyre bringing food to the surface. I had read a lot of books about whaling. The fall time whaling fleet was always successful; they always managed to get a

few more whales right there. It was a big commercial whaling area 100 years ago. [community member] went up there and sure enough they got into them. [His] crew struck the first whale, but they were blowing everywhere. There must have been 40 whales to the horizon. (Wainwright Hunter Observation March 2011)

According to this participant's traditional knowledge, bowhead whales formerly migrated west toward Wrangell Island after feeding in the trench, but now migrate on a more southerly route that carries them toward Wainwright. Citing global warming influences on the bowhead whale migration, this participant continued:

I think it is a possible sign of the times. If we continue to have global warming influences, we might need to adapt to a fall whaling environment. We didn't see them in the fall in years past; they don't come close to here in the fall. They'd hit the Barrow Arch and head straight to Wrangell Island. I have a feeling that some of them go to Peard Bay and feed in that upwelling. They'll feed there and then take off to Wrangell. [In the past] we'd have to go 50 miles offshore. To get them right there that point where the eddy was observed, that's only 15 miles off the beach from Franklin Point. (Wainwright Hunter Observation March 2011)

Most community members who sought to harvest seals or walruses were able to do so, though six participants said that high winds and a lack of sea ice reduced the number of boating opportunities for the season. Participants who commented on the walrus hunt said that the ice went out too fast and too far, taking the walruses with them. Two participants had the following to say about walrus hunting for the season,

If it was like years previous, we would have had more hunts added on to more waypoints. Like the walrus hunt we missed because the ice went out too far. We couldn't access the ice. If the ice was closer, we would have had access to it, and we would have followed the ice looking for the walrus. This year I actually waited until the fall time…that's when I harvested one. In the beginning of the season, month of July and the first week of August [for walrus hunting]. But the ice was so far out we had no access. Too much east wind, it blew it out and it was gone. (Wainwright Hunter Observation December 2010)

Very few people got walrus this year. The ones that got them were hunting in the open water. I think there were a few caught in June. It was pretty much northeast wind for a month, two months. We had hardly any southwest winds. The berries grew really good though. (Wainwright Hunter Observation December 2010)

Participants also said that unfavorable wind and ice conditions hampered their efforts to harvest bearded seals. Two participants said:

If you look at everybody else's data, there's a one week period in August that everyone got bearded seals. That was it; that's not normal. We usually get them all the time. It's because there's no ice; it was all blown out to sea. Not having no ice. We had no ice, open water for about 200 miles all summer long. It was pretty hard to use the ocean because it was too dangerous. There was that one week period that they had gotten those seals. After that, nothing. When that opening happened I wasn't home so my boat didn't even go out in the ocean. (Wainwright Hunter Observation December 2010)

[Harvest amounts for the year were] about the same; we would have gotten more if we had the ice. The bearded seals sleep on the ice, but we had to look for them in the water. When the ice goes out we go out boating, but you have to look at the ice and the current to see what way the ice was going. I think I was lucky enough to get one one day. (Wainwright Hunter Observation December 2010)

Despite unfavorable wind and weather conditions, one participant said that sealing conditions improved for a two week period in June. Though brief, the window allowed community members a good opportunity to harvest bearded seals:

> *The seals typically come the middle of June, and we're here, we're waiting, people are struggling to get their boats launched because of the soft sand and there's no seals. Wide open water. The conditions were a little choppy, and then one day toward the end of June about the same time I started getting hits on the fish finder then the seals come, and we had—it was an amazing hunting window. Almost two weeks of perfect weather.* (Wainwright Hunter Observation March 2011)

Similar to the hunting activity trips, while participants indicated their harvests were comparable to previous years, not all active community harvesters were in this study and therefore this study did not capture the community-wide subsistence offshore harvest. This study was designed as a GPS subsistence tracking study that also documented harvest amounts for trips reported by study participants. A comprehensive household harvest survey would be required in order to adequately capture total community offshore harvest amounts.

Harvest Locations Compared to Past Years. Participants noted that while harvest locations for the 2010 boating season were typical, many harvests occurred during the less than optimal period when sea ice was not present close to shore (e.g., ice free conditions with no visible ice). Seals, such as bearded seal, and walruses are generally sighted, harvested, and butchered while they are on ice, as opposed to while in the water. The traditional practice of the Iñupiat is to use the floating ice pans as platforms on which hunters can successfully shoot and butcher large marine mammals as opposed to the water, where an animal can sink and where it is difficult to butcher so it is often towed to shore. Lack of sea ice makes it more difficult to spot seals and walruses and adds challenges to the harvesting and butchering process. Three residents summed up their experiences in the following manner:

> *It was pretty much the same, but we had to look for them in the open water. When we've got ice, we'll see more because we'll see them on the ice and in the water.* (Wainwright Hunter Observation December 2010)

> *[My harvest locations were] about the same, yeah, but we could have gotten more if we had the ice. There would have been bearded seals on the ice floes. We had to look for them on the water. As soon as the ice goes out we try to go out boating depending on the weather and the current.* (Wainwright Hunter Observation December 2010)

> *The walrus, like I said, no ice around. They had to shoot them in the open water and drag them to the ground. It wasn't a kill on the ice like it usually is. Same with the bearded seals.* (Wainwright Hunter Observation December 2010)

One participant commented that Wainwright hunters may focus their activities to the north or to the south of the village in any given year, but over many years the aggregated pattern of offshore subsistence hunting is a fan spreading outward from Wainwright in all directions. This participant expressed an exploration and development concern that a data set limited to only a few years may give a false impression about offshore subsistence activities in Wainwright:

> *When we got that whale up north, I indicated that Wainwright is focusing its entire whaling operation to the north. [I told the oil companies that] you are free to make a southern approach, and you will not be interfering with whaling activities. I'm concerned that the oil companies are going to interpret that as Wainwright never goes south. This information is going to indicate where we go out to sea over the course of a few years. Will that be used against us in the future to put boundaries on our hunting areas? I'm concerned just because I did most of my hunting this year in a fan out of Wainwright, but some years it's all to the south and some years it's all to the north. Every year is different.*

I hope we get enough information to really comprehensively blanket the area that we use. (Wainwright Hunter Observation March 2011)

3.4.2.2 Hunting Conditions

3.4.2.2.1 Weather Conditions Compared to Past Years.

When asked to compare weather conditions in 2010 to previous years, participants consistently reported that 2010 was a warm year characterized by strong and persistent winds, mostly easterly winds that took the ice away from Wainwright. Participants noted that the warm conditions experienced in 2010 are part of a trend toward longer summers that has caused a decrease in sea ice over the previous 10 years. One participant said that the summer, in particular, was very windy with persistent winds out of the east. This participant said,

> *Weather conditions, windy coming out of the east. Too much east wind. The wind and the current were so that they took it [the ice pans] out just like that. Sometimes we don't even need wind to take out the ice. Sometimes when the currents switch, it will take it out. We don't need wind at all.* (Wainwright Hunter Observation December 2010)

Another participant said that the high winds narrowed the extent of his boating trips:

> *Windy weather conditions throughout the summer. If we had better weather conditions there would be more waypoints on there extending from Franklin Point to Icy Cape.* (Wainwright Hunter Observation December 2010)

One participant, however, offered a slightly more nuanced view. He agreed that the region has experienced some warming since he was a child, but he suggested that the wind experienced in the community was nothing out of the ordinary and not part of a larger trend. He said,

> *It hasn't changed, I mean weather wise, wind. Each season is different. Some seasons will be calm, some seasons will be windy, some seasons the ice will be in and some seasons the ice will go out early. It's just the early thaw and the late freeze ever since it started warming up. When I was growing up we'd have an early freeze in September and October. In June we'd ride our snowmachines to go down to the blanket toss down the coast.* (Wainwright Hunter Observation December 2010)

3.4.2.2.2 Water and Ice Conditions Compared to Past Years.

When the field researcher asked participants to compare water and ice conditions in 2010 to previous years, participants again stated that the region has undergone significant warming over the past 10 years. Participants consistently reported that break-up is occurring earlier, freeze-up is occurring later, and sea ice is thinner and is less anchored to the coast than in past years. For the most part, residents agreed that 2010 exhibited a continuation of all these trends.

Participants' most significant and persistent concern is the absence of sea ice in general. Sea ice is of enormous importance to spring whaling (stable shorefast ice provides a secure platform for spring whaling camps and leads provide access zones for bowheads), and sealing, and walrus hunting (floating ice pans provide harvest/butchering platforms) because it makes it easier to spot, harvest, and butcher these animals. High winds and warm temperatures force residents to hunt in the open water which can reduce harvests. Three participants commented that the ice went out early in 2010 and one added that the ice did not return until the end of October:

> *There was ice last year* [2009]. *We had access to the ice where we could hunt the bearded seal and the walrus. This previous year* [2010] *we did not have access to that ice. We had to hunt in the open water. If we had ice we'd take it to the ice, and we'd*

butcher there. This year we had to either drag it home or put it in the boat and butcher it on the land. (Wainwright Hunter Observation December 2010)

All I have to say is not like it used to be but it's maybe due to the ice not coming back in. Yeah, no ice coming back; no ice coming in next year. Once it went out in the latter part of June or first part of July, it didn't come in. In the past the ice used to come in the middle part of August and – get beached. That's when people used to haul ice for drinking water. The saline goes down, and the ice gets fresh. And when you look at the pressure ridges on the beach, they're not thick. (Wainwright Hunter Observation December 2010)

The wind I guess, you know, the wind just blew the ice off and it never came back until the end of October, November. (Wainwright Hunter Observation December 2010)

Another participant suggested that the return of the ice at the end of October was a favorable change compared to previous years when ice did not appear until December. This participant said,

We actually got ice this year. I'm happy that's its sticking around. Previous years we had no ice in December. That's actually good for us because it's just safer for our spring hunt. It won't blow out. It will actually stay there. (Wainwright Hunter Observation December 2010)

Two participants added that the absence of sea ice makes the ocean choppier and boating conditions more dangerous. When sea ice isn't present, residents must wait for the weather to calm down before taking their boats out on the water. They said,

With that ice and it's blowing it's going to be calmer, but without the ice it's choppier. When we had the ice come in it was kind of choppy yet we can go out. When it didn't come back in, we just had to wait for calmer weather. Otherwise we would be sticking out closer to the ice floes away from the rough water. We've got the ice. When the ice isn't out there you have to wait for the weather to calm down. (Wainwright Hunter Observation December 2010)

The ice went out early then the [spring and fall] whaling seasons were very windy. That's why we weren't able to get out on the water as much. The fall too. It got windy and we weren't able to launch from the shore. (Wainwright Hunter Observation December 2010)

Participants have noted that when ice is present, it is typically thin or first year ice. There has been a marked reduction in the quantity of multiyear ice in recent years. As one participant provided the following observation:

Yeah, because it was so thin. The shorefast ice was so thin. The thickest ice I saw was three to four feet thick. Where the lead edge might have been [out in front of town] and that was like piled up ice and a pressure ridge... The rest was pretty much thin. (Wainwright Hunter Observation December 2010)

Three participants offered retrospective views of break-up, freeze-up and ice conditions near Wainwright. Each of these participants said that ice is present in Wainwright for a shorter period of time now than in past years. These participants said:

Ten years ago it was a little bit different but not anymore. Late freeze-up. Late freeze-up even on land maybe affecting the migration of the caribou somewhat. (Wainwright Hunter Observation December 2010)

For me, I really never thought about it. I just started taking it seriously. The ice going out earlier. Especially in the winter time it goes out in January, sometimes it goes out in

February. Then I start worrying about [spring whaling]. (Wainwright Hunter Observation December 2010)

Ten years ago we've got videos of July 4 activity. Twenty years ago and you see still see shorefast ice. In the late 90s that's when you started to see the change – I did anyway. The 2000s were up and down years, and then that change started. Freeze-up was like a month later… the lagoon. It was raining here just a couple weeks ago. November it was raining. Rain like actual rain. It was something else. (Wainwright Hunter Observation December 2010)

3.4.3 Subsistence Resource Observations

Although not the primary purpose of the project, participants were asked to share their observations of animals they observed and harvested while boating. Specifically, the field researcher asked participants to comment on the health, behavior, abundance, and distribution of animals. Though weather and ice conditions carried walruses and seals away from the coast, the consensus among participants was that animals were abundant and healthy throughout the year even though they weren't easy to access from Wainwright. As one participant said,

I guess the bearded seal were pretty much – people were landing so I guess they were plentiful. People who got the walrus got them when they were coming back in the fall time. The bearded seal my boys caught was okay. The whales they caught were okay. The belugas they caught were good. (Wainwright Hunter Observation December 2010)

One participant, commenting on the bearded seals, added that the bearded seals near the shore were quite small. This participant did not realize there were larger seals present near Wainwright until he traveled 40 miles from shore on a work related activity. He suggested that the larger, more mature seals were better able to navigate the deeper water 40 miles from shore,

The seals we were getting were small, six to eight feet, young seals, but when I was working 40 miles offshore in water depths between 300 and 400 feet I'm counting huge "bucket heads" [local name for very large bearded seals] bearded seals working in deep water. I had no idea that they were out there that far in that deep water. Probably out that far because there's feed out there. There were no small ones out there. These were big animals, eight to 10 footers. (Wainwright Hunter Observation March 2011)

In addition to the end-of-season subsistence resource observations, participants made observations of unusual wildlife health, behavior, abundance, and distribution during the regular field discussions. During one discussion, a participant noted observing a high abundance of small seals located in the 30 feet deep water and attributed their abundance in the area to a strong salmon run. Another hunter commented on the unusual occurrence of bearded seal along the shorefast ice and attributed their distribution to the lack of ice in the ocean. One hunter reported a similar observation of unusual distribution of walrus along the beach, saying,

More than usual, they're coming up on the beach. They never used to do that. Nowadays they're swimming; we look for swimming ones. I was happy we at least got to get one to put in our [ice] cellar. (Wainwright Hunter Observation 2010)

With regard to seals and gray whales, one individual reported a lack of these animals particularly between Pt. Belcher and Atunik (see Map 1) and although unsure of the reason, indicated hunting pressure may have been a cause for the lack of spotted seals. He said,

The lack of animals, especially between Pt. Belcher and Atunik is usually loaded with seals and gray whales this year. I'm getting the same word from the people working the ships offshore. Seahorse Islands at this time of year is usually full of kaseluks*, spotted*

seals. No. There were quite a few boats and families subsisting at Peard Bay. I don't know if it was hunting pressure... (Wainwright Hunter Observation 2010)

Other unusual wildlife observations included unusual migratory behavior of gray whales and bowhead, low abundance of eiders, an unhealthy eider (i.e., foul smelling) due to an attached radio transmitter, injured bearded seal, and late run of salmon. Regarding the gray whales, the participant indicated that gray whales were sighted in October and usually they have moved out of the area in September. Regarding the bowhead, one participant noted they were holding up in a broken ice area in April rather than moving out into open water.

3.4.4 Continued Participation in Project

During the end-of-season reviews participants were asked if they were interested in participating in the project during the 2011 boating season. All participants who consented to the end-of-season reviews expressed interest in being a participant in 2011. Each study participants was also asked if they knew of any other active subsistence harvesters that might be interested in the study. Three additional names were received and attempts to contact these individuals prior to the start of the 2011 boating season were made.

3.4.5 Project Suggestions and Feedback

The study team asked participants to share any suggestions they had for the COMIDA project. All participants said they were pleased with the project. Several participants commented that the GPS units have been helpful because they aid in navigating and recording locations where participants had previously been, and one participant said that the GPS units and the weather station aided the search and rescue volunteers. Participants had the following to say about the COMIDA study:

I think you guys are doing pretty good. We get to log where we're hunting, and we can actually have a say where all our hunting grounds are. You guys are actually logging them. That's good for us hunters. (Wainwright Hunter Observation December 2010)

I have been enjoying the GPS; my brother went out and marked it on the GPS, and I went out and followed it and it went right to the carcass. They are really accurate. (Wainwright Hunter Observation December 2010)

Most people here like the handheld stuff. There's a handful of us that turn it on and it never turns off until we leave that snowmachine or that boat. We just like marking where we are and comparing where we are for the day when we call each other on the phone. We do that quite often in the family. I think the GPS that you guys provided are doing the job. A lot more people are using them than before. (Wainwright Hunter Observation December 2010)

I really like the way you guys are running it. Really engaged. I've worked with a lot of research options, and you're one of the more well engaged operations with the village. (Wainwright Hunter Observation March 2011)

3.5 End of 2011 Season Reviews

In November 2011, the field researcher conducted 10 end-of-season reviews in Wainwright (out of the 22 active 2011 study participants). As in 2010, the purpose of the end-of-season reviews was to provide an opportunity for study participants to compare the 2011 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences. In 2011, the field researcher did not review each participant's subsistence tracks and information at the end of the season because these data were reviewed during the trip summary questions. End-of-season reviews were also used to determine if any study participants had noticed any unusual weather or wildlife related

observations, to solicit suggestions for possible subsequent years of the project, and to confirm whether or not they would be willing to participate if the study continued into 2012.

3.5.1 2011 Boating Season Compared to Previous Seasons

Wainwright participants reported that 2011 was a good year for marine mammal harvests. A strip of landfast ice remained in front of the community long after most of the ocean ice had melted or floated out to sea. The ice provided a place for them to butcher harvested animals. Participants also reported that marine mammals were plentiful this year; most participants were able to harvest as many walruses and bearded seals as they needed. Wainwright whalers harvested a fall bowhead whale for the second time in as many years. Participants made the following general comments about the 2011 boating season:

> *It was a good season [compared to previous seasons]. We harvested many animals. The fall whaling season was successful again. We got a lot of food home to people and shared it throughout the community. It was a good year.* (Wainwright Hunter Observation November 2011)

> *This year was pretty good. I got stocked up in my freezer. I gave a whole bunch to my relatives; I think a little bit more than I did last year. Turned out pretty good. I think this was the most I've been active. It was a good year, this year.* (Wainwright Hunter Observation November 2011)

> *The hunting was pretty good this year. We harvested another whale and you know it was unbelievable again to land a whale fall time.* (Wainwright Hunter Observation November 2011)

> *Good. For me it was good. I got walrus, I got eider ducks, I got geese, I got bearded seals, I got* natchiqs *[ringed seal], I got polar bears, I got beluga, I got whales. We get caribou. For me and my family the season was awesome. Even with the lack of ice a lot better than last year. The ice stayed longer than it did the last couple of years so that made it a lot more successful for everybody.* (Wainwright Hunter Observation November 2011)

3.5.1.1 Hunting Activities

Harvest Amounts Compared to Past Years. Most Wainwright participants reported that their harvest amounts in 2011 were similar to previous years. When asked how the 2011 boating season compared to all the boating seasons they had knowledge of in Wainwright, some long term residents suggested that 2011 marked a return to more normal harvest amounts. Participants said that they were able to harvest the bearded seals they needed, though a few participants added that they were unable to harvest any walruses this year. Wainwright also harvested a fall bowhead whale in October which several participants cited as a significant component of the overall success of the season. Participants made the following general comments about their harvest amounts for the 2011 season:

> *Good. Not poor and not rich but good. Pretty average, yes.* (Wainwright Hunter Observation November 2011)

> *Yeah, it was a good season. Yeah [I was able to harvest what we needed]. [If] my other friends want help I'll go out with them or I'll take them if they want to get some. I'll help my friends; one wanted to get a bearded seal and I helped him. I think I got four [bearded seals] this year.* (Wainwright Hunter Observation November 2011)

> *That's usually about what I get [one bearded seal and one walrus]. I would have got more walrus but I don't [have] dogs anymore. Used to get quite a bit when we had quite a bit of dogs. It got a little easier; we only got one dog. Now we get one just to eat it. They [the dogs] just died of old age. I never got a walrus in a few years. I finally got one*

but my uncles would get some. This is the year I finally went out and got one. (Wainwright Hunter Observation November 2011)

Wainwright successfully harvested a bowhead whale in the fall. This was the second successful fall bowhead whale harvest in as many years. Wainwright participants reported that, prior to 2010, Wainwright whalers had not harvested a fall bowhead whale in at least 70 years. Two participants commented that they still consider a fall bowhead whale harvest to be an atypical event. They said,

> *No. It wasn't typical [because of the fall whale Wainwright harvested] I rarely hunt seals, just bearded seals. I just landed two with my boy and my son-in-law.* (Wainwright Hunter Observation November 2011)

> *It was a pretty good year. It was unbelievable to see a whale in the fall time. My first trip I seen it with my own eyes. There were how many more popping up. Two at a time, one at a time. It was amazing to see a whale up close. I was the harpooner. I usually let the young ones do it but I had to.* (Wainwright Hunter Observation November 2011)

One participant added that the meat from the bowhead whale was a significant reason for the overall success of the season and provided food for the entire village. He said,

> *This year was another successful year because they landed another fall whale. It helps out the entire village because of the meat supply.* (Wainwright Hunter Observation November 2011)

Two participants reported that they were able to harvest what they needed for the season, but added that they did not harvest any walruses in 2011. One of these participants reported that unfavorable ice conditions had prevented him from harvesting walruses. Participants prefer to harvest walruses when sea ice is present. Sea ice makes it easier and safer to harvest walruses and provides a platform for butchering that prevents sand from mixing into the meat. This participant reported that he had not harvested any walruses for several years due to the persistent lack of sea ice during the walrus hunting season:

> *We've harvested our caribou, our bearded seal, our whales. The only difference is the ice is gone all the time for walrus. I haven't gotten walrus for three or four years.* (Wainwright Hunter Observation November 2011)

Another participant commented that he also had not harvested any walruses this year. Instead, he relied on other community members who had successfully harvested walruses to get the walrus meat he needed:

> *Yeah I got everything I needed but like I said the bearded seal came from my bother in law. I didn't get walrus. The walrus I do have is from the people that got some.* (Wainwright Hunter Observation November 2011)

During the January 2012 community review meeting about the 2010 and 2011 seasons, one individual noted that the lack of sea ice has led to a decreased harvest and that when marine mammals are sighted in open water the hunters have to act quickly to harvest them or risk losing them. He said,

> *The lack of ice not being close to our village. In the past we used to harvest more than that when the ice used to be closer. When we do go out when they're swimming. We've got to be fast to harpoon them.* (Wainwright Community Review Meeting January 2012)

Harvest Locations Compared to Past Years. In general, participants reported that marine mammals were more abundant in 2011 than in 2010. The greater abundance of marine mammals reduced the amount of time hunters had to spend looking for them and allowed hunters to harvest them closer to shore. A strip of landfast ice remained anchored to the shore in front of Wainwright for several weeks after the main body of pack ice had floated out to sea. This strip of ice provided seal habitat and provided hunters with a platform for harvesting and butchering the animals. One participant compared harvest

locations in 2010 and 2011 by sharing his experiences with hunting bearded seals across both years. He said,

> *Last year I went all the way to Peard Bay. This year we got them right out here. So it was a pretty good year for bearded seal for us. We got eight of them so it was pretty good. I gave the skins to a whaling captain in Barrow. He helped me for blanket toss*[1]*. He gave me his boat so I got him fresh [skins] and sent them this year.* (Wainwright Hunter Observation November 2011)

One participant explained that the strip of landfast ice in front of Wainwright provided him with a convenient place to hunt, especially after the main body of pack ice retreated to sea. This participant said,

> *Like I said we were hunting on that landfast ice out there. That pack ice was gone. It was either hunt on that or in the open water. Usually when ice is round you pull it up on the ice and use it as a platform for butchering the animal. You don't need to bring the bones back. If you wanted you could bring the whole animal.* (Wainwright Hunter Observation November 2011)

During the 2012 community review meeting, one community member discussed the differences in hunting conditions that occurred between 2010 and 2011 saying,

> *Our weather conditions on the ocean have been dramatically different. In 2010 we had wide open water. In 2011 we had a pressure ridge one mile offshore that was from Icy Cape to Barrow all the way to July. It was great. Who knows what 2012 is going to bring us.* (Wainwright Community Review Meeting January 2012)

Once the strip of landfast ice melted away, Wainwright hunters had no access to sea ice for the rest of the boating season. The main body of pack ice retreated from Wainwright during the spring in both 2010 and 2011 and did not return until very late in the fall. As the season progressed, the lack of sea ice made it more difficult for hunters to harvest bearded seals and walruses. One participant reported traveling as far as Franklin Point to reach a group of bearded seals resting on some remaining ice floes:

> *If the ice was in we could've gotten more. It's hard to see the bearded seals when you're in the waves. It's better to harvest them sooner. The sooner [earlier in the season] we get them, but it's a hot season. We don't want the blubber to render into seal oil [because it turned rancid in the heat]. It gets strong. And the walruses weren't that… we just had…we harvested one that was swimming. We harvested five of them out on an ice floe farther in front of Franklin Point. It got rough on us so we just got what we could get at.* (Wainwright Hunter Observation November 2011)

Lack of sea ice also influences Wainwright's fall whaling practices. Sea ice did not begin to appear until the very end of October in 2011; this allowed whaling crews to launch their boats later in the season than in years past and permitted them to travel farther from shore provided winds were light and the ocean was reasonably calm. Participants reported traveling farther offshore in search of bowhead whales than they did in 2010, in some cases journeying up to 40 miles from Wainwright. Two participants attributed this change to the location of the whales this year. They said,

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[1]The blanket toss occurs during the spring whaling festival of *Nalukataq* that celebrates successful bowhead harvests. During this event, all the whaling captains and their crews who have captured bowhead whales during the previous season present themselves and portions of their catch on a designated ground where the entire community gathers. Each captain and crew provide *maktak* for the assembled community and the blanket toss is conducted as part of thanks to the whales as well as enjoyment of the people. For further information regarding *Nalukataq* see Spencer 1976.

We noticed that the whales were a little bit farther out this year. (Wainwright Hunter Observation November 2011)

As soon as Barrow gets the quota they stop and [the whales] get close to Wainwright. They were still farther out, and we had to use a bigger boat to drag [the whale] in. (Wainwright Hunter Observation November 2011)

3.5.1.2 Hunting Conditions

3.5.1.2.1 Weather Conditions Compared to Past Years.

Nearly all Wainwright participants reported that 2011 was a warm and windy year. Participants also reported high winds and warm temperatures in 2010; however, the strong, persistent winds and constant warm temperatures that characterized the 2010 boating season were less intense during the 2011 boating season. Participants reported that intermittent periods of calm weather and cool temperatures allowed them greater access to offshore subsistence resources in 2011. Four participants reported that the winds were very high in 2011, but all of them said that they still managed to harvest what they needed during the season's short periods of relative calm:

The weather has been windy quite a bit this year, more than other years. I just find pockets in the weather when I can go out, at least for an hour or two, then come back. Just check Weatherbug, find out when the wind is going to shift, that's my time to go out. Just choppy, that's it. (Wainwright Hunter Observation November 2011)

I thought it was strange we got the wind a little bit earlier than normal. Our fall weather it seemed like it came earlier and then it calmed down. Usually we have all these fall storms but we didn't get that until later, until October. I thought that was strange. It was a little bit different. Between the winds that's when we were able to get out there and go whaling. The ice not being there, it makes it…it just makes you think about the weather that much more because there's no ice there to break the waves. (Wainwright Hunter Observation November 2011)

There was a little bit more wind. [The wind affected hunting a] little bit. We just stayed home until we got good weather again. (Wainwright Hunter Observation November 2011)

This year was kind of a little windy and choppy. Last year was pretty good. The crews never went back out right after we landed the fall whale last year. It got windy, it got calm the same day we were cutting the whale, and then the wind picked up again. (Wainwright Hunter Observation November 2011)

One participant suggested that a decrease in the amount of south wind this season as compared to previous seasons allowed him to go hunting more than he did last year. He said,

We had less south wind than previous years and the ocean was calm enough to go out and hunt every other day. Not like last year. (Wainwright Hunter Observation November 2011)

Another participant also commented that there was less south wind this year as compared to previous years. This participant said that southwest winds are responsible for bringing sea ice to shore during a February storm and contributed to the pressure ridges of ice that were piled in front of Wainwright at the start of the spring whaling season. This participant added that the southwest winds did not return at all after the February storm:

Hardly any southwest wind. I don't think we had any really good southwest winds. The only one was in February. It brought all that ice in. It was way back in February after

> kivgiq *[mid-winter Iñupiaq festival]. It was what brought all that rough ice. Spring, fall, summer. I never noticed any southwest wind. Barely. It usually brings the ice in. Just one thing I've noticed over the years. It hasn't been recently. We would always look for those August, September storms out of the southwest. We don't get those anymore. The winds are always blowing out of the east, northeast.* (Wainwright Hunter Observation November 2011)

One participant said that winds are more unpredictable now than they were in the past. When wind conditions are unpredictable, it makes boating trips more hazardous for the crews that are out on the water. Nearly all of the boats used for subsistence in Wainwright are open skiffs. Rough conditions can capsize a boat, and heavy spray mixed with subfreezing temperatures can cause heavy icing and hypothermia. One participant commenting on the fall bowhead harvest made the following observations,

> *It's unpredictable nowadays. Sometimes we wait and wait for the wind to die down before we go out boating. The last time they brought the whale in those boaters were really wet. Well [the ice] is not as thick as it used to be. We hope that the ice doesn't break off when the wind [comes in] from the northeast.* (Wainwright Hunter Observation November 2011)

Several participants commented that the 2011 boating season was abnormally warm. Persistent warm weather was also a defining characteristic of the 2010 boating season and was a frequent topic of conversation throughout the year. One participant pointed out that the warm conditions are now affecting the ability of residents to process their catch in a traditional manner without it turning rancid:

> *It was good but it was a harder season this time. [Our] seal oil fermented and it got kind of strong. I guess we should've put them in the cellar when we got done. I guess the weather was too strong. What's that word? Rancid. It was too hot. Seems like it's getting hotter every year when we harvest. I mean it's [seal oil] good but we let it stay out too long it gets rancid.* (Wainwright Hunter Observation November 2011)

Another participant suggested that the onset of break-up now begins a month early and the onset of freeze-up now begins a month late as compared to when he was a youth in Wainwright:

> *We've just got to get used to the early thaw and late freeze-up. This crazy weather around here. I think we should just put in the daylight savings month instead of one hour. We get one month behind and it'll be back to normal.* (Wainwright Hunter Observation November 2011)

3.5.1.2.2 Water and Ice Conditions Compared to Past Years

When asked to compare water and ice conditions in 2011 to previous years, participants again stated that the region has undergone significant warming over the past 10 years. Participants consistently reported that break-up is occurring earlier, freeze-up is occurring later, and sea ice is thinner and is less anchored to the coast than in past years. Residents noted that the sea ice remained close to Wainwright for a longer period of time in 2011 than it has for the past five years, but added that the sea ice did not return after the strip of landfast ice in front of the community melted in the spring.

Participants noted three significant features that characterized the water and ice conditions in 2011. First, a February storm pushed the sea ice against the shore and built up pressure ridges along the beach. Wainwright whalers reported that the pressure ridges added to the amount of labor and time they had to spend breaking trail for spring whaling and made it difficult to haul harvested whales onto the ice. As two participants stated:

I don't know. I wasn't out there in the spring time, but the spring time ice conditions were horrid. They had a hard time finding places to land the whale. Yeah it was worse than the other years. (Wainwright Hunter Observation November 2011)

The ice conditions sucked. The pressure ridges made it difficult to get out to the water at the beginning of the season. The pressure ridges at the open lead – we had to do a lot of chopping so we could get the whale up. (Wainwright Hunter Observation June 2011)

Another participant added that the presence of the pressure ridges had a major impact on where spring whaling crews set up camp because the ridges block access to the lead and limit access:

Windy. I don't think that's unusual though. West wind all winter long. Pressure ridges are a lot more than usual. That was a big factor in where we went. (Wainwright Hunter Observation June 2011)

Second, a strip of landfast ice, likely anchored to the shoreline during February's storm, remained in front of Wainwright for several weeks after the main body of pack ice drifted out to sea. The presence of the landfast ice made it easier for participants to harvest and butcher their catch. Participants shared their experiences as follows:

It was a little more harvested this year than last year. On top of it all we got to harvest walrus on the ice this year. The ice hung around longer than last year. (Wainwright Hunter Observation November 2011)

I was happy to see some ice you know when the ice broke up, I was happy to see some ice stick around longer than last year. I mean the last few years before this when the ice went it just went and never came back. This year some ice stayed behind and actually some ice did come in front of town about 10, 15 miles out. That was nice because we had something to butcher on instead of bringing back our catch to butcher on the tundra where the mosquitoes were. There wasn't much ice. There wasn't much floating ice. When the ice first took off it was ridged up on the shallows here. It didn't leave. It stayed put. As the rest of the ice left we had a little stretch of ice along the coast. That was good to see. (Wainwright Hunter Observation November 2011)

Well [the presence of the ice made] butchering easier. I know the ice provided some break, you know, wind break. It kept a certain area of the water calmer than the rest. It stuck around longer only in a little area. The tide didn't come up high enough to haul it away. We had some pretty big pressure ridges here in the winter. (Wainwright Hunter Observation November 2011)

I caught just as many bearded seals this year as I did last year. Just having the ice there made a world of difference. (Wainwright Hunter Observation November 2011)

Third, once the strip of landfast ice in front of the community melted away, participants reported that the sea ice did not return again until the very end of the boating season. The lack of sea ice during summer made it difficult for participants to harvest walruses and bearded seals because they were forced to hunt in the open water. Two participants summed up some of the challenges associated with hunting in the open water as follows:

After whaling the ice went out and all we had was that landfast ice that was stuck there. I didn't harvest any walruses. Some people were lucky enough – the ones that hunted in the open water. I didn't have time to do that because I was working night shift. Hunting in the open water, you've got to have several whole days. A day because you've got to harvest them and then cut them somehow in the open water. That's quite a bit of work. (Wainwright Hunter Observation November 2011)

> *Once [the ice] came in it just went out and that was during the World Eskimo Indian Olympics [in July]. And my nephew was at the Olympics when we could see the ice. Real calm. [The ocean was] somewhat [calmer] than last year but not that much. Without the ice it's kind of rough out there so we had to limit our hunt because of the waves. The ice not coming back in August too [is] causing more erosion.* (Wainwright Hunter Observation November 2011)

Another participant suggested that the extra weeks with sea ice late in the spring constituted only a minor departure from a long-term trend towards less sea ice:

> *It's been the same the past five years because of the lack of ice, but the ice did stay a few weeks longer spring summer time frame but after that it became like any other five year period between now and then.* (Wainwright Hunter Observation November 2011)

A third participant added that the lack of summer sea ice is also slowing the formation of sea ice in the fall. He said,

> *Seems like it's getting to a point where there is no ice. Maybe due to the fact that the main pack ice is farther out and not as close as it used to be. That's why we get a late freeze up. You can see it's starting to freeze up but when the wind gets going it blows out. The ice is not as solid as it used to be.* (Wainwright Hunter Observation November 2011)

One participant pointed out, however, that extra weeks without sea ice in the fall provide additional boating opportunities for whaling crews. Once the ice comes in, whalers can no longer launch their boats into the water with ease. This participant said,

> *Because this is new to us it didn't work out the way we thought it was going to work out this year. If the ice hadn't come in we could've still been whaling a couple weeks ago. We would've been whaling a week after he caught that whale but to launch boats with the ice as it is now would be pretty difficult.* (Wainwright Hunter Observation November 2011)

One participant shared some sea ice observations by comparing present conditions to conditions as far back as the 1980s. This participant said that the amount of ice present on the surface of the ocean is unchanged since the 1980s, but added that the ice is thinner than it used to be. This participant had the following to say about sea ice changes in Wainwright over the past several decades:

> *Ice is staying around longer than normal for the last five years but it's about normal for the past 20 years. It's about normal for what it was in the 80s. I remember seeing them go out there late June with snowmachines. Looking at last five years the ice is out there longer, but a longer study [from] 80s to today it's about average. Ice is thinner than it was back in the 80s. Not thick ice. Our ice is thinner from what I'm told. It's thinner but staying longer this year.*

3.5.2 Subsistence Resource Observations

Although not the primary purpose of the project, participants were asked at the end of the season to share their observations of animals they sighted and harvested while boating. Specifically, the field researcher asked participants to comment on the health, behavior, abundance, and distribution of animals they encountered while traveling offshore. To gather more timely observations the study team also asked the same questions during trip summaries in 2011 which resulted in a greater number of observations than in 2010. In 2011, the broad consensus among Wainwright participants was that most of the animals were abundant and healthy throughout the year. As one participant said, "No they're pretty healthy, everything, caribous, whales" (Wainwright Hunter Observation November 2011).

3.5.2.1 Health of Animals

All participants who reported on the health of local wildlife commented on seals. While some individuals reported healthy seals, a number of participant comments focused on seeing sick bearded and ringed seal during the 2011 season. A few observations of unhealthy seals concerned natural injuries, however, a number of observations also focused on sick or diseased seals. Regarding the healthy seals, two participants said,

> *The animals we saw looked healthy. They were just as cautious to see us out there as they were in the summer. They didn't want us to get close like they do in the summer.* (Wainwright Hunter Observation November 2011)

> *We were surprised to see huge bearded seals out there [in the ocean]. It might be the time of year. When we saw a large bearded seal dive we had to wait to see if it wasn't a whale because it was so huge.* (Wainwright Hunter Observation October 2011)

Most participants who commented on seal health, however, reported seeing sick bearded or ringed seals at some point during the boating season. Two participants reported seeing immobilized newborn ringed seals hauled out on the beach or the ice:

> *The ringed seals, yeah, they were on the ice. One of them the mother must have left it. We went all the way up to it, and it just stayed on the ice. I think that one was a pup. That was unusual. Usually they die in the water. We waited around to see if the mother was going to show up but it never showed up. I don't know if it left it or it something got the mother. That was a baby bearded seal.* (Wainwright Hunter Observation August 2011)

> *They're* natchiqs*. They were newborns. The ones that were born this spring. Six, seven of them. They [the seals] wouldn't even move. They wouldn't even move away. No ice I guess for them to climb up. Maybe they're getting sick from the food they're eating.* (Wainwright Hunter Observation July 2011)

Several participants reported that the seals appeared to be weak or sick. One participant also commented that many of them had lesions on their skin. Two participants said:

> *The seals that came onto the beach later in the summer… we ran into more sickly seals that came into the beach trying to rest. Most of them had skin lesions or tumors. Like tumors on their backs and that was pretty odd for us to see them like that…the ringed seals.* (Wainwright Hunter Observation November 2011)

> *The* natchiqs*. They were [sick] and there was a lot obtained on the beach all the way to Franklin Point and back. When you go up to a seal, they'll turn around and go for the water. They were so tired you'd go up and touch them, and they'd just look at you. A few had scars and discoloration on their skin. Their feet were cut up.…That was August time frame, September. September we focused upriver so we don't really know [how the seals were doing] in September. All of this was by four-wheeler up and down the coast. Most everyone you ask about four-wheeler rides they're going to tell you about the seals.* (Wainwright Hunter Observation November 2011)

NOAA launched an investigation into the reports of sick seals after local hunters and the North Slope Borough Division of Wildlife Management first observed the sick animals in July and August 2011. As of March 2012, NOAA had not yet determined the cause of the sickness (NOAA 2012).

Several observations of sick or injured seals were related to natural injuries or natural causes. One participant observed that some of the spotted seals had broken arms, though he didn't know the cause of the injuries. He said,

There were some with broken arms [spotted seals]. You just go right up to it, and you could tell it was broken. We couldn't tell why it was broken. It could have been from the waves slamming them, it could have been attacks, it could have been anything. I wouldn't know what to say on that. (Wainwright Hunter Observation November 2011)

Two participants said that they had seen sick or injured bearded seals while boating. Both participants attributed the poor health of the seals they saw to natural causes:

I honestly believe [the sick bearded seal] didn't have its mother. It had almost no fat on it compared to the one that had its mother. Could have lost its mother from a walrus or a polar bear. I have no idea how. It didn't have a mother in my opinion. (Wainwright Hunter Observation July 2011)

Bearded seal that we [shot], the eye was out of the socket. One of my uncles said it might have gotten caught on the ice or crushed on the ice. The blubber was only about an inch and a half but it was still good. The meat was good. (Wainwright Hunter Observation July 2011)

One participant, offering a retrospective look at seal encounters over his boating years, said that he had noticed a decline in the abundance and health of the seals near Wainwright:

I'm seeing, compared to all the years I've been out there, I'm seeing that the numbers are decreasing and then also noticed that they're more slender and not as large as they used to be. We see large ones once in a while, but you'd have to go just over the horizon which is about 12 miles. To me my first thought was they're not getting enough food. When we were growing up we would see them they'd be much plumper. The seals were much rounder. They seem healthy. They're more slender. I haven't noticed any unusual growth on them or anything like that. (Wainwright Hunter Observation August 2011)

3.5.2.2 Distribution

In general participants made few observations regarding anomalous distribution of marine mammals in 2011. Several participants reported that large numbers of spotted seals began hauling out on the beaches near Wainwright late in the summer. One participant noticed an increase in the number of seals hauled out on the beach in 2011 as compared to previous years and shared his observation. He said,

There were more seals on the beach than previous years. Everything else looked normal to me. All the other animals we harvested were all healthy. We harvested everything from them. (Wainwright Hunter Observation November 2011)

Three participants shared walrus observations. Two participants said that they didn't see any walruses this year, but both suggested that this might have been the result of the participants' timing rather than the result of something affecting the behavior of the walruses. These participants said,

I didn't see anything unusual [with the animals] other than me not seeing any walruses this year, but that was just my timing. (Wainwright Hunter Observation November 2011)

I didn't see any walruses this year, but then again I was late. When they made the call saying the walruses were out there, I didn't see one walrus. This was all summer. I know people have caught walrus out there. I did harvest some walrus from a walrus we found floating on a piece of ice that was still warm. That's the only way I harvested my walrus this year. I was able to salvage some of the walrus meat. And like I did last year, I did some harvest. I distributed harvest to some of the people I normally distribute. It's just something I like to do with my wife every year. They're elderly. (Wainwright Hunter Observation November 2011)

A third participant observed thousands of walruses migrating south along the coast in the fall. This participant said that they appeared to be healthy:

> *We got to watch the thousands of walruses go back. That was awesome. They kept on going from Franklin Point past Wainwright. Healthy bunch [of walruses]. [We were at] Point Belcher just watching for four hours. We even left before the end of them showed up. Only about a mile off the beach following their leader.* (Wainwright Hunter Observation November 2011)

One participant reported an anomalous observation related to the distribution of wildlife during the trip summary sessions. This participant said that the bowhead whales were farther from the shore during the spring hunt than in years past and suggested that the width of the open lead may have been a factor in their distance from shore. This participant said,

> *They were farther out. The lead was open. It's not like it used to be long time ago. You used to be able to see the whales from whaling camp. It's been windy [windier in recent years].* (Wainwright Hunter Observation June 2011)

Two participants shared observations of whales rarely seen near Wainwright. They said,

> *First time I've ever seen a minke whale. [It was] probably lost, looking for food.* (Wainwright Hunter Observation July 2011)

> *We went on a trip with [individual] and he saw a killer whale. This was on a trip up north in his boat.* (Wainwright Hunter Observation August 2011)

3.5.2.3 Abundance

When asked about animal abundance, participants commented on the whales, seals, and walruses they had seen while boating; in some cases participants indicated a change in local abundance but were not clear if there was a greater change in population levels. Two participants said that they had seen more bowhead whales in the spring than they had seen in 2010. One participant didn't offer an explanation for the increase, but another said that the number of bowhead whale sightings was higher when the open lead in front of Wainwright was narrow. These participants said,

> *More whales than last year. Not sure why.* (Wainwright Hunter Observation June 2011)

> *Before the lead got wide open we'd see lots of them. When the ice came out we didn't see much because the lead was wide open. Better than last year. Last year we only got two whales and the year before we got one.* (Wainwright Hunter Observation June 2011)

One participant said that he saw more whales in the fall of 2011 than he did in the fall of 2010. He did not offer an explanation for the increase.

Three participants commented on the local seal population. Two of these participants said that they had noticed an increase in the seal population. One participant said that the seal population in 2011 was higher than it had been in 2010. The other participant suggested that lingering sea ice might have been a factor that influenced the increase in the seal population. These two participants shared their observations as follows:

> *There were large bearded seals out there. I don't know if that's unusual, but there were a few large bearded seals out there. Maybe more than I've seen during* ugruk *season. I don't know why [there were so many].* (Wainwright Hunter Observation November 2011)

> *More bearded seals than last year thanks to the ice conditions.* (Wainwright Hunter Observation June 2011)

A third participant provided a more retrospective look at the seal population and said that the seal numbers have declined over the past 15 years:

> *The numbers, I could say for sure that the seals have dropped down significantly more like 15 years. They seem like they've been dropping. That's my observation.* (Wainwright Hunter Observation August 2011)

One participant reported that walruses were not very abundant this year. This participant suggested that sea ice conditions did not provide adequate habitat to sustain a local walrus population. Even though Wainwright had a stretch of shorefast ice that lingered in front of the community until July, there was no sea ice farther from town where the walruses prefer to haul out. This participant said,

> *The walrus numbers are kind of low this year. Not too many places for them to haul out on. Not much ice. When we usually see walrus in front of town they're about 12 miles out. The ice we saw this year was too close to town I think.* (Wainwright Hunter Observation July 2011)

Although participants rarely mentioned gray whales during sessions, one participant said that he had noticed a decline in their numbers which he attributed to lack of sea ice. This participant said,

> *I notice there are not many gray whales around these days. No idea other than I don't know. The ice is always gone.* (Wainwright Hunter Observation November 2011)

3.5.2.4 Behavior

During trip summary questions and end-of-season reviews, a total of three participants reported unusual wildlife behavior. One participant reported seeing walruses hauling out on an ice floe elevated high above the water. This participant said that walruses typically haul out on low ice floes. This participant added that the walruses must have been on the high ice floe because that was the only sea ice present at the time. He said,

> *The ice they were on was not the regular ice floe we usually hunt them on. The ice was high. That was the only ice they could get on.* (Wainwright Hunter Observation July 2011)

Two participants reported occurrences of tame animals while hunting offshore. These participants said:

> *Bearded seals were swimming toward us. They usually don't do that.* (Wainwright Hunter Observation July 2011)

> *The only thing about that whale was it kept going in circles like it was waiting for us. Like those old timers say, the whale waits for you when it wants to give itself up.* (Wainwright Hunter Observation November 2011)

3.5.3 Project Suggestions and Feedback

Before concluding each end-of-season review, the study team reminded each participant that 2011 was the last year of the COMIDA study (the study team subsequently received an extension from BOEM to continue the study for 2012). Participants were asked to share any thoughts or suggestions they had about the COMIDA project. All participants said they were pleased with the project, but several participants were surprised that the study was ending just as Wainwright was starting to harvest fall whales. Two participants had the following to say about the end of the COMIDA study:

> *I think it should continue because I understand this is the last year for it. We need it to continue as we're now seeing we have to go farther for the whales. The ice is continuing to not come in when it should. To show the world where we actually hunt we need to continue this project because the world wants to see scientific data and not traditional*

knowledge. I believe our people are willing to work with the scientific world to make this possible. We used to say we go here, here, here and they're like yeah right. Now we're going to work with you to mitigate issues if oil and gas and is to continue. That's my thought of this project. It's a very, very important project of baseline studies. If there is a catastrophe we can prove to them what it cost, how much we went, how much we share. With the best of our ability put a dollar amount to the loss when there is no true dollar amount for losing a piece of our culture. (Wainwright Hunter Observation November 2011)

Love to see SRB&A do an update and throw the question to the community should we continue this project. I think Wainwright will support that. I'm hoping Point Lay will support that too. (Wainwright Hunter Observation November 2011)

You've only been here two years, and we just started going out fall whaling. (Wainwright Hunter Observation November 2011)

One of the most frequent suggestions received was that the study should include terrestrial subsistence trips as well. As one participant pointed out, any offshore development near Wainwright is likely to have terrestrial components as well:

[Adding inland trips to the study] would help us out if they decide to make a pipeline it will help us divert them from our main hunting grounds. We'll actually have a record of where we're at and what we're hunting and where the migrations are. (Wainwright Hunter Observation November 2011)

Finally, one participant commented that Shell Oil should do more to help out local subsistence hunters since they stand to make a lot of money from their operations in the vicinity of Wainwright. This participant said,

Actually [name withheld says], when we have our coffee breaks, if Shell plans on coming out, these guys they're looking at making a lot of money. They should at least provide the whaling community with cold water immersion suits so if they do fall in the water at least they do have some time to be rescued. That's just peanuts. It wouldn't cost them too much money. Whaling captains, they spend a lot of money to put a crew out in the spring time. To have Shell or Conoco purchase these PPEs [Personal Protective Equipment], we would feel much safer out there. They stand to make a lot of money. I think we said, we talked to each other. We didn't ask for much and they're coming in anyway. If you don't ask you won't get an answer. (Wainwright Hunter Observation November 2011)

3.6 End of 2012 Season Reviews

In November 2012, the field researcher conducted eight end-of-season reviews in Wainwright out of the 17 active 2012 study participants). As in the previous study years, the purpose of the end-of-season reviews was to provide an opportunity for study participants to compare the 2012 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences. In 2012, the field researcher did not review each participant's subsistence tracks and information at the end of the season because these data were reviewed during the trip summary questions. End-of-season reviews were also used to determine if any study participants had noticed any unusual weather or wildlife related observations, to solicit suggestions for possible subsequent years of the project, and to confirm whether or not they would be willing to participate if the study continued into 2013.

3.6.1 2012 Boating Season Compared to Previous Seasons

The consensus among Wainwright participants was that 2012 was the most productive of the three study years. Wainwright successfully landed four bowhead whales in the spring. Most participants said that the presence of sea ice into the summer allowed them to harvest seals, bearded seals, and walruses with greater ease in 2012 than in 2010 or 2011. Three participants who had lived in Wainwright for many years said that 2012 was the most productive year in recent memory, comparable to conditions in the 1980s. These participants said,

> *Of all the years, I think this is the most successful year I've had so far. Although it was windy from the north, we could travel out to the ice because it wasn't too bad.* (Wainwright Hunter Observation October 2012)

> *Last year and this year were just like when I was younger. The ice was there; the weather was good; the animals were all over the place.* (Wainwright Hunter Observation October 2012)

> *It was like I was young again back in the [19]80s when I go boating with my dad. It was good; animals all over.* (Wainwright Hunter Observation October 2012)

Favorable offshore boating conditions ended in August. High winds and persistent rain began shortly after the sea ice retreated in August and continued for the duration of the open water season. Most participants hunt inland caribou in August and September regardless of offshore conditions, so rough seas have less of an impact on participants' boating activities during these months. Wainwright chose not to go fall whaling in 2012 in part due to unsafe boating conditions, but also because of the success of the spring whaling season and the fact that the community had only a single bowhead strike remaining for the fall. Wainwright chose to donate its last strike to another community.

3.6.1.1 Hunting Activities

Harvest Amounts Compared to Past Years. All participants who shared their observations of the 2012 season said that harvest amounts were the same or higher in 2012 than in 2010 or 2011. Participants cited the presence of sea ice for several extra weeks in the spring as the most likely reason for the increase in the number of animals harvested in 2012. Sea ice provides habitat for seals and walruses, so its presence near Wainwright allows hunters to travel shorter distances to hunt these animals. Participants made the following comments about the presence of sea ice and its impact on hunting activities:

> *This summer was actually more animals harvested than previous years since the ice hung around. In other words, our summer was bountiful.* (Wainwright Hunter Observation August 2012)

> *The only thing I'll say is it's been successful this year more than last year. The animals seem to be a lot closer this year. Travelling has been good. The ice that's been nearby stayed for a while and it's been a lot better for us this year than it has before. Last year the ice went out pretty quick, and this year it stuck around quite a while for us to get the seals and walrus on the ice.* (Wainwright Hunter Observation October 2012)

> *This year was better than the years before. The ice lingered a little bit longer than last year or the other year. Within the last five years it stayed a little bit longer [this year]. We got to hunt walruses.* (Wainwright Hunter Observation October 2012)

> *We had a really bountiful year. I got two bearded seals. Try to look for walrus but they were too far inside the ice. There was a lot of ice. I haven't seen this much ice in seven or eight years. Maybe it's Act of God. It made the animals stay; it's good. This year was 10 times better. Ice brings the animals in. And the seas are calm [because of the ice].* (Wainwright Hunter Observation October 2012)

One participant added that the season's success was community-wide. According to this participant, everyone in the community who made the effort to go boating returned with something to show for their effort:

> *The bearded seals went up because the ice stayed. Everybody was coming home with two or three at a time. Really good.* (Wainwright Hunter Observation October 2012)

Another participant said that his success for the year had allowed him to put a sizable quantity of his harvest into storage. He said,

> *I've already had to empty out my freezer and put them down in the cellar. My freezer is full again. I might have to empty out one more time. It's a good thing about storage, if you get too much you can always get more.* (Wainwright Hunter Observation October 2012)

Wainwright's 2012 beluga harvest was notable for both its level of organization and its success. Beluga hunts generally involve one to a few boats; at most, one or two belugas are harvested at a time. Community beluga harvest counts totaled less than 10 in 2010 and 2011. In 2012, the community of Wainwright held a community beluga hunt. Approximately 40 people participated in the hunt and the community harvested about 30 belugas. One participant told the study team that the 2012 harvest was similar to what he remembered from the 1990s. This participant added that the community sometimes used beluga meat to supplement a poor bearded seal and walrus harvest.

> *Well, the most we got was back in the 90s I think was 48. That was back in the late 90s. Just something we haven't had for a long time.* (Wainwright Hunter Observation October 2012)

Harvest Locations Compared to Past Years. The presence of sea ice allowed participants to hunt walruses on the ice with more success than in past years. Hunters prefer to hunt walruses on sea ice for three major reasons. First, shooting a walrus that is hauled out on an ice floe minimizes the risk that the walrus will sink into the ocean before it is harvested. Second, the ice provides a platform upon which to butcher the walrus as opposed to the difficult job of butchering a large marine mammal in the water or having to haul it to shore. Third, butchering a walrus on sea ice prevents sand and other debris from getting into the meat. Participants who harvested walruses shared the following about their harvest locations in 2012 as compared to past years:

> *We used to cut up walruses on the beach and right now we hunt walrus on the summer, cut them on the ice. That was good, nice and clean. We get to have meat. The last two years we've been hunting on walrus not on ice, only when they've been migrating down south. That's the only time we could get walrus.* (Wainwright Hunter Observation October 2012)

> *This is the first time we ever landed walruses on ice and the first time we have ice. This year is unusual. First time we ever had ice. How many years we never had ice. It's unusual for us to have ice almost until August. People are hunting walruses and* ugruks*.* (Wainwright Hunter Observation July 2012)

> *We had more ice this year. Get to hunt walrus, get to hunt* ugruk*. First time we get to hunt walrus on the ice. First time ever in two years. We've been getting fall walruses last two years.* (Wainwright Hunter Observation October 2012)

3.6.1.2 Hunting Conditions

3.6.1.2.1 Weather Conditions Compared to Past Years

Wainwright participants characterized the 2012 boating season as warm, wet, and windy. As in 2010 and 2011, participants reported above average temperatures in 2012. Although the sea ice lingered for a few extra weeks, the ocean did not begin to freeze until October. When asked how the weather compared to past years, two participants said,

> *Just a lot warmer than usual, that's about it. Warmer, lot of rain. Usually [the ice] is already forming out there. You can still go boating.* (Wainwright Hunter Observation October 2012)

> *Back in the 90s we used to get a lot of bearded seals and the ice used to stay a little longer. I'd be frozen by now. It was still cold like back in the 90s and the 80s. The ocean would have been frozen about the middle of last month. Last week when I went out caribou hunting I was sweating like crazy because it was so warm.* (Wainwright Hunter Observation October 2012)

The weather turned wet and windy in August and remained that way through October. Wainwright participants had finished the majority of their offshore boating activities for the year by August, but high winds did contribute to the community's decision to not hold a fall bowhead whale hunt. Three participants had the following to say about the weather's role in the cancelled fall bowhead whale hunt:

> *[The swells] have been high since September. They went out for a couple days before the wind picked up. The whaling captains only had 18 foot boats. They were using their crew members' 20 foot boats. No whaling captain owns any canopy covered boat. Once you start towing it takes 12, 13 hours to get home. One time in the spring we towed our whale 36 hours against the current. Once the current comes from the south that gets to be like six, seven miles an hour.* (Wainwright Hunter Observation October 2012)

> *Fall time has been windy ever since September, first part of October it started and never quit. We never did go out [fall whaling]. It's been too rough. Our boats are too small. We need 24 footer boats. It's been bad for us. It's been very bad for us to go fall whaling this year. We never did go out.* (Wainwright Hunter Observation October 2012)

> *Summer's been a windy one. Fall season has been windy too with the open water. Too much open water. The ice is too far out. We didn't get to go fall whaling and fall walrus hunting. It was too rough. Nobody has been out in the ocean. It's been too rough.* (Wainwright Hunter Observation October 2012)

One participant, however, remarked that the damp conditions made it easier to harvest caribou because the resulting mosquitoes pushed them to the coast. He said,

> *Yeah, there was a lot of rain. If anything it made it better for the caribou. It made them hang around. After it rains is when the bugs really come out.* (Wainwright Hunter Observation October 2012)

3.6.1.2.2 Water and Ice Conditions Compared to Past Years

Wainwright participants encountered sea ice during offshore boating trips until the first week of August. This was different from conditions in 2010 and to a lesser extent in 2011 when the ice retreated from the shore over a month earlier in the year than in 2012. The presence of sea ice for so many extra weeks in the summer made it easier for locals to access and harvest marine mammals. Participants made the following comments about sea ice conditions during the 2012 boating season:

> *Finally, we're having ice [for the first time] in years. Usually it's just gone. It's been how many years. We finally have ice, and I finally get to see walrus on the ice.* (Wainwright Hunter Observation July 2012)

> *Probably what was most unusual was that we had ice stay so close to our shoreline so late in the season. It's unusual in the last five years.* (Wainwright Hunter Observation October 2012)

> *This would be a normal year like eight years ago, but from that point until now the ice hasn't really stayed like it did this year.* (Wainwright Hunter Observation October 2012)

One participant said that the sea ice was keeping bearded seals out of the water and close to shore. This participant suggested that he thought the sea ice was providing good habitat for the seals:

> *That's unusual—the first time I noticed this ice being close to Wainwright. It's keeping them out of the water. They're feeding too. After they feed, they go on the ice to rest. They float with the ice.* (Wainwright Hunter Observation July 2012)

Another participant added that the presence of ice so close to shore made it easier to bring his catch back to town. This participant said, "It's a lot easier when the ice sticks around. Don't have to bring them all the way back" (Wainwright Hunter Observation July 2012).

Wildlife Disturbance form Air and Watercraft The 2012 study year was the first year the study team added a specific query to the trip summary questions that addressed the presence of unusual aircraft and watercraft near the community. While the question did not directly address the issue of subsistence interference from aircraft and watercraft, participants were candid and forthright when they thought the presence of these crafts had impacted subsistence harvests.

Five Wainwright participants noticed and commented on the U.S. Coast Guard's increased presence in the Chukchi Sea. Two of these participants said that, though the Coast Guard was easily visible from shore, their activities caused little to no interference to subsistence activities:

> *We ran into Coast Guard out there about 10 miles out cutting through the ice. I don't think we saw any more ships. Just the Coast Guard was the only ship we saw. We saw that plane that's flying, the one that's doing the grid. We saw them about eight miles out. They flew right over us.* (Wainwright Hunter Observation August 2012)

> *Just when was it? Sunday. Coast Guard ship, and I don't know what that big blue ship was, the one hanging out here yesterday. We didn't mind them. They were working their way north and they came back south later that evening. I think they ran into too much ice and turned around.* (Wainwright Hunter Observation July 2012)

Three participants shared a different experience, however:

> *Actually yesterday, the day we got that bearded seal [21st] that ship was going straight through the ice pack even though it could have gone offshore. That morning we saw lots of walruses on the ice. They all went in the water because that ship was around – the one that went straight through the ice. It kind of got me mad because I wanted to catch a walrus. That ship had the U.S. Coast Guard sign on it.* (Wainwright Hunter Observation July 2012)

> *The U.S. Coast Guard was out there on Sunday. They were actually out there yesterday. We were trying to hunt spotted seal and [with] this Coast Guard boat [I] was afraid to pick up a rifle after that. I felt like there were some eyeballs watching us. I don't know if they interfered – we just felt uncomfortable. We were close at one point. We could see people walking around on deck.* (Wainwright Hunter Observation July 2012)

On that last trip my nephew was telling me, it might have been a Coast Guard helicopter overhead. They're just active up here now. I guess they're planning to stay for the whole summer until the ships leave the Arctic waters and then they'll head back south to Kodiak. They're flying their C-130 here. Recently my nephew was telling me they were flying above the walrus herds. Here we were trying to harvest the walruses. (Wainwright Hunter Observation July 2012)

Two participants said that they had noticed an overall increase in the level of offshore activity in 2012. These participants said,

I've seen more but not unusual. Unusual means I didn't know it was doing or where it was going. I just see more human activity out there than usual. (Wainwright Hunter Observation August 2012)

There was more ship activity this fall than any other falls. (Wainwright Hunter Observation October 2012)

3.6.2 Subsistence Resource Observations

3.6.2.1 Health

In general, participants said that the animals they saw and the animals they harvested during the 2012 boating season were healthy. Few participants reported seeing or harvesting sick animals. The presence of sea ice for much of the summer provided seals and walruses with habitat that was not available to them in 2010 and 2011, and the seal sickness that Wainwright participants reported to the North Slope Borough in 2011 did not appear to be present in 2012. Two participants said that they didn't see any sick seals at all in 2012. These participants had the following to say about the 2012 season,

I haven't seen [sick animals] this year. I guess it all depends on where the ice is. They have no place to rest; they end up washing up on the beach. We haven't seen any. Usually we'll find them up north by Point Franklin or by Icy Cape. We don't go that far that time of the year. (Wainwright Hunter Observation October 2012)

I didn't see any sick seals this year, or the ones that I caught weren't sick. I've got a picture of one. (Wainwright Hunter Observation October 2012)

Three participants did report seeing sick walruses and bearded seals in 2012, but neither said that the sickness was anything out of the ordinary or to be concerned about:

We caught one sick bearded seal. It had severe hair loss on the flipper and white spots on the lung when we opened it up. It was on one of the trips. We didn't even bring the GPS. We just sunk it in the ocean, took pictures and sent them out. (Wainwright Hunter Observation August 2012)

Just a lot of sick bearded seals I've noticed. I think that's been going around. (Wainwright Hunter Observation July 2012)

We saw a few sick walruses and a few sick bearded seals but most of them were all healthy. (Wainwright Hunter Observation October 2012)

3.6.2.2 Distribution

It is not uncommon for a few participants to report seeing species that are infrequent visitors to the Wainwright area during the summer. The 2012 study year was no different in this regard, with participants reporting the following unusual wildlife sightings of pilot, orca, gray, and minke whales during the boating season:

We saw a pilot whale out there. That's something we don't see. (Wainwright Hunter Observation July 2012)

They say there were two killer whales but we only saw one when we went up north. I think they're keeping the walruses inside the ice. (Wainwright Hunter Observation July 2012)

I heard they've been sighting gray whales too not far out. (Wainwright Hunter Observation July 2012)

Minke whales, been a year that we've seen them. (Wainwright Hunter Observation August 2012)

3.6.2.3 Abundance

Most Wainwright participants said that animals were more abundant in 2012 than in other recent years. The relative abundance of animals in 2012 appeared to be due to the presence of sea ice for several extra weeks in the summer. These extra weeks of sea ice seemed to benefit the walrus population the most. Three participants had the following to say about the increase in the abundance of this species during the year,

More this year than years before – walrus anyway. Or maybe the migration. It's more along the U.S. coast than along the Siberian coast. We've got a lot of walruses this year. Maybe last year they migrate more the Siberian coast, because when you look up fish and game that walrus herds [were in] Siberia last year. They get a lot more walrus harvests. (Wainwright Hunter Observation July 2012)

The ice is hanging around this year as opposed to no ice last year. I know it would be helpful for the walruses. There's a lot of walruses this year. (Wainwright Hunter Observation July 2012)

Yeah, unusually for us. We don't see walruses. Only when they migrate south is when we get walruses. Right now we're harvesting walruses on the ice. (Wainwright Hunter Observation July 2012)

Three individuals commented on the abundance of seals in 2012. One person noted there were more ringed seals and attributed the increase to fewer people hunting them. Two participants said that there were fewer bearded seals on the ocean as compared to other recent years. These participants said,

The distribution is far and few between [bearded seals]. Less than usual. No idea [why the numbers are down]. (Wainwright Hunter Observation June 2012)

This summer we never see any seals. The year before they refused to go in the water [last year], but this year we never see that kind of seals. They all look healthy. Once you see them they run out and get back in the water. (Wainwright Hunter Observation October 2012)

Despite a potential decline as observed by the above comments from the two participants, study participants reported over 50 bearded seal harvests, the highest of the three study years.

One of the most unusual features of the 2012 boating season was the large number of cetaceans other than bowhead whales reported in the ocean near Wainwright. Multiple participants reported seeing large numbers of gray whales just off the coast. Two participants reported seeing killer whales, and a single participant reported seeing a Minke whale. These participants shared the following observations:

There's a lot of gray whales out there. There seems to be more gray whales out there than I've seen in the past. You see a lot of gray whales but there just seem to be a lot of

gray whales out there. I want to say I've seen more gray whales this year than I've seen in past boating trips. (Wainwright Hunter Observation July 2012)

The only thing I noticed is we're seeing a lot more Minke whales and killer whales this year. Yeah there was some out here this summer chasing baby gray whales. Got to watch a live show this summer. They got that baby gray whale. (Wainwright Hunter Observation October 2012)

High number of gray whales. There was a very, very high number of gray whales. We just saw quite a bit more this year, I mean literally. I mean it's like the numbers doubled. They might have had a good breeding year and they finally showed up with their babies. This is a good sign it means the ocean is healthy when you see an abundance of animals. Not that we can't manage them, it's just unusual. Numbers literally doubled. (Wainwright Hunter Observation October 2012)

One participant said that he had seen more spectacled eiders this year, a good sign because they are an endangered species. He said,

Looks like there's more than usual. Even some of the endangered species, some of those eider ducks, there are a lot of those too. I think it might be the spectacled [that's endangered]. We're seeing a lot more of those. (Wainwright Hunter Observation October 2012)

3.6.2.4 Behavior

Most of the time, participants reported unusual animal behavior as a consequence of human activities such as vessel traffic and aircraft (see Section 3.1.7.2.3 Safety and Access). This section contains observations of unusual behavior related to natural causes.

Several participants reported the presence of a large iceberg frozen inside the shorefast ice during the spring bowhead whale hunt. The iceberg provided hunters with a conspicuous landmark for navigation. One participant observed that migrating bowhead whales appeared to be using a large iceberg as a navigation marker:

Maybe a little bit closer [the whales]. That big iceberg was there. It wasn't diverting them. It seemed they were using it for a marker or something because they were coming out on the floating ice. That's where they come out on the north side. Maybe they thought it was part of the landfast ice or something. Maybe they thought it was shorefast ice. They might have thought it was attached but I don't know. (Wainwright Hunter Observation June 2012)

Another participant said that he observed killer whales attacking gray whales just offshore from Wainwright. Participants do not hunt either species, but do share incidents with the study team involving non-subsistence species when they are unusual or otherwise notable. This participant said,

Right about that time, the first of July, I remember the day after I got bearded seal, and I got nothing. The place was empty. There were killer whales out there, and they were hitting the gray whales pretty hard. We watched a killer whale attacking a gray whale for an hour. It's the first time I've observed killer whales. (Wainwright Hunter Observation October 2012)

3.6.3 Project Suggestions and Feedback

All 2012 participants said they would continue to participate in the study if the study continued for additional years. When asked what the study team could do better in the future, participants said they needed up to date GPS units and requested additional fuel vouchers to offset the high cost of gasoline.

Most participants have GPS units that by the 2012 study year were three years old. Some GPS units are starting to wear out due to heavy use, and the technology has become obsolete. There is also a feeling among some study participants that the amount of fuel the vouchers provide is not commensurate with the amount of time participants spend recording tracks and meeting the field researcher to download tracks and report hunter observations. Three participants shared the following suggestions:

> *Maybe high end GPS. There's quite a few; I don't know if any of the people got the GPS and didn't get the GPS.* (Wainwright Hunter Observation October 2012)

> *If you start to do it again you need to update the GPSs. The ones we're currently using are obsolete. If you're going to do it again you're going to need more gas vouchers.* (Wainwright Hunter Observation October 2012)

> *We need better GPSs and more gas. I believe we're going to have more boating time again. As much information as we share, I believe we're going to need more gas for that.* (Wainwright Hunter Observation October 2012)

CHAPTER 4: POINT LAY

The community of Point Lay is located on the coast of the North Slope, south of the Kokolik River mouth (Map 1). The current community is located near the old village site called *Kali* (Impact Assessment Inc [IAI] 1989b). According to the U.S. Census Bureau (1884), the earliest reported population at Point Lay was 30 residents in 1880. Neakok et al. (1985) notes that in the early 1900s, Icy Cape and Point Lay "vied as the region's major population center" and reports that Point Lay eventually became the primary settlement between Point Hope and Wainwright by the early 1930s. People from Icy Cape to the north and from Kuchiak to the south resettled at Point Lay in 1930, after the school was moved there. Point Lay's population peaked during the 1930s to 132 people in 1938 (United States Department of the Interior, Bureau of Indian Affairs 1938). After the Icy Cape school closed in 1926 (IAI 1989a), many more people moved to Point Lay and the population grew from 70 residents in 1933 to its peak pre-World War II population of 145 residents in 1940. The population of Point Lay remained relatively low from the 1940s through the 1970s, at times consisting of only one couple. Residents with family ties to the area began returning to Point Lay in the 1970s when the North Slope Borough and Arctic Slope Regional Corporation encouraged resettlement (IAI 1989a). By 1974, the North Slope Borough School District had established a school in the old school house at Point Lay (IAI 1989a). Over the 20 years between 1972 and 1992, the community was moved and essentially rebuilt twice. The moves were from the barrier islands to nearby higher ground, with more room for community expansion and easier access to fresh water.

According to the U.S. Census Bureau, 189 individuals resided in Point Lay in 2010, 88 percent of whom were Alaska Native (U.S. Census Bureau 2010). Residents of Point Lay rely heavily on their yearly harvests of subsistence resources including beluga, seal, walrus, caribou, and fish. Since 2008, Point Lay residents resumed bowhead whaling harvest activities and, when harvested as in 2009 and 2011, bowhead contribute substantially to the overall community harvest. For additional information and comprehensive discussion of Point Lay's offshore and onshore subsistence activities, the reader is referred to earlier subsistence studies conducted in these communities including Schneider and Bennett 1979, IAI 1989a, and George and Fuller 1997.

4.1 Study Participants

In Point Lay, a total of 10, 15, and 13 participants provided tracks throughout the three respective study years (2010, 2011, and 2012). Table 31 provides a frequency distribution of the status of study participants at the close of the three seasons. In 2010, seven participants did not go out at all during the season, with four of these reporting problems with their boats. Two participants moved out of Point Lay early in the season. In 2011, there were three participants who did not go out at all during the season and one who reported observations but did not bring his GPS during hunting trips; the remaining 15 all participated in the study and provided hunting tracks. Of the 2012 Point Lay participants, the field researcher obtained tracks and recorded observations from 13 individuals. Four did not go boating all season and one forgot to bring his GPS on boating trips.

Table 31: Status of Point Lay Participants at Close of Season

Status	Number of Participants		
	2010	2011	2012
Obtained Tracks and Reported Observations	10	15	13
Reported Observations but Obtained No Tracks	1	1	
Boat Was Down All Season	4		
Did not Go Boating All Season	3	3	4
Moved Out of Community	2		
Did not Bring GPS on Boating Trips			1
Total	20	19	18

Stephen R. Braund & Associates, 2013.

Table 32 provides a frequency and percentage distribution of Point Lay participants by age, including participants who did not submit GPS tracks or meet with the study team during the 2010 through 2012 boating seasons. In all three study years, the age group with the greatest number of participants shifted. In 2010, there were eight participants between 40 and 49 years of age (35 percent), making this the largest age cohort among Point Lay participants. In 2011, however, the largest age group was represented by individuals between 20 and 29 years of age. The shift in the percentage of participants toward a younger population in 2011 resulted from five older participants in the 40-49 age range leaving the study; the actual number of participants in the younger age categories (i.e., five people aged 20 to 29) remained the same. In 2012, the distribution of participants shifted again with the previous largest age group in 2011 (20-29 age range) dropping from five to two individuals, and the largest age group represented by the 30-39 age range (five participants).

Table 32: Age of Participants in Point Lay

Age	2010		2011		2012	
	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants
20-29	5	22%	5	29%	2	13%
30-39	4	17%	4	24%	5	31%
40-49	8	35%	3	18%	4	25%
50-59	4	17%	4	24%	2	13%
60 and over	2	9%	1	6%	3	19%
Total	23	100%	17	100%	16	100%

Stephen R. Braund & Associates, 2013.

Point Lay is a relatively recent settlement on the North Slope. Though several families occupied the area near Point Lay as early as the 1880s, the modern village of Point Lay dates from the 1970s (Alaska Department of Commerce, Community, and Economic Development, Division of Community and

Regional Affairs n.d.). Point Lay's newness relative to other North Slope villages is reflected in the fact that the majority of participants were born in another North Slope community.

Table 33 provides a frequency and percentage distribution of the number of years participants have lived in Point Lay. The majority of participants in all three study years (65-77 percent) had lived in Point Lay for more than 20 years. Several individuals reported having lived in Point Lay between 11 and 19 years. In 2010, two participants had lived in Point Lay less than 10 years; these two participants had left the study by 2011.

Table 33: Years of Residence in Point Lay

Years in Point Lay	2010		2011		2012	
	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants	Number of Participants	Percent of Participants
0-5 years	1	4%	0	0%	0	0%
6-10 years	1	4%	0	0%	0	0%
11-19 years	5	22%	6	35%	4	24%
20 plus years	16	70%	11	65%	13	77%
Total	23	100%	17	100%	17	100.0%

Stephen R. Braund & Associates, 2013.

Table 34 lists all vessels in Point Lay involved in the study. One participant reported owning three boats plus an Argo (amphibious vehicle); three participants reported owning two boats; and all other participants reported owning one boat. Lund manufactured the aluminum skiffs, the majority of the boats involved in the study. Vessels ranged in length from 14 to 21 feet, although the majority of vessels were 18 feet long. There was considerable variation in outboard motor horsepower, ranging from six to 115.

Table 34: Point Lay Vessels Involved in the Study 2010-2012

Participant	Vessel Type	Vessel Length (ft.)	HP Motor
1	Lund	18	40
2	Crestliner	18	50
2	Lund	16	30
2	G3 John	18	50
2	Argo (8 wheeler)		6
3	Klamath	18	70
3	G3	14	15
4	Lund	18	60
5	Ocean Pro	19	90
6	Lund	18	60
7	Lund	18	40
8	Lund	18	50
9	Lund	16	30
10	Lund	18	60
11	Lund	18	75
11	Lund	18	88
12	River Runner	18	30

Participant	Vessel Type	Vessel Length (ft.)	HP Motor
13		18	28
14	Lund	18	40
15	Lund	18	45
16	Ocean Pro	19	90
17	Lund	16	40
18	Lund	21	90
19	Lund	18	50
20	Lund	16	40
21	Lund	18	50
22	Alumaweld	19	115
22	Lund	18	28
23	Lund	18	40

Stephen R. Braund & Associates, 2013.

4.2 Hunting Activity Details

This section describes the offshore hunting patterns of Point Lay residents during the 2010, 2011, and 2012 boating seasons. The field researcher used GPS tracks obtained from participants, as well as the results of hunter observations associated with each hunting trip, to summarize offshore subsistence activities. The tables, graphs, and maps included throughout this section contain the results of this summary and provide information on the location, duration, and timing of hunting activities, the number and composition of hunting parties, and the estimated costs per trip.

Point Lay residents recorded 89 offshore trips during the 2010 season; 114 offshore trips from the 2011 season; and 139 offshore trips in 2012. Table 35 lists the breakdown of these trips. For 2010, 57 tracks are hunting trips taken in a boat, 16 are offshore snowmachine trips to hunting areas (e.g., bowhead whaling camp), and 16 are offshore trips that do not fit into either category (e.g., not a hunting trip, or trips with no purpose ascertained). Four of the 57 hunting trips and one of the snowmachine trips did not have associated GPS tracks. One trip had multiple participants recording the same trip resulting in 52 unique boat tracks for 2010. For 2011, 70 tracks are hunting trips taken in a boat, 33 are offshore snowmachine trips to hunting areas (e.g., bowhead whaling camp), and 11 are offshore trips that do not fit into either category. Eight trips had multiple participants recording the same trip resulting in 62 unique boat tracks recorded for 2011. In 2012, project participants reported 117 hunting activity trips, 5 other trips with no hunting purpose, and 17 snowmachine trips. Five trips had multiple participants recording the same trip resulting in 112 unique boat tracks recorded for 2012.

Table 35: Point Lay Trip Summary

Trip Type	2010	2011	2012
Hunting Activity Trips (Unique Boat Tracks)	57 (52)*	70 (62)	117 (112)
Other Trips (no hunting purpose)	16	11	5
Snowmachine Trip to Hunting Area	16	33	17
Total Trips	89	114	139
*Four of the 57 hunting activity trips in 2010 do not have associated GPS track data			

Stephen R. Braund & Associates, 2013.

At the close of the 2011 boating season, the field researcher compiled and totaled the number of trips and harvests without corresponding GPS tracks for the entire boating season in Point Lay. Point Lay participants reported between 13 to 18 snowmachine trips to hunting areas and 28 to 30 hunting activity trips without corresponding GPS tracks for the year. Participants reported harvesting between two to three bearded seal, one spotted seal, one walrus, and seven eider ducks that were not accounted for because participants did not bring GPS units on these trips.

During trip summary questions in 2012, Point Lay participants reported completing a total of 14 trips without a GPS in 2012. Nine of these trips were for bowhead whale, three were for bearded seal, and two were for beluga whale. Participants reported harvesting two bearded seals and one spotted seal during hunting activity trips completed without a GPS.

The remainder of tables and maps for Point Lay 2010, 2011, and 2012 offshore hunting activities are based on the hunting activity trips and boat tracks for those years. In some instances, participants did not provide or could not remember the answer to each question asked of them and thus the total number of trips for each data table may be less than 57 for 2010, 70 for 2011, or 117 in 2012. For example, Table 51 lists wind direction for 50 trips in 2010. In this case, participants did not provide a wind direction for the other seven hunting activity trips. As discussed above in the methods, the maps show the unique boat tracks (i.e., duplicate tracks removed from trips with multiple participants recording the same track) that represent the hunting activity trips.

4.2.1 Location of Hunting Activities

Map 54 through Map 56 show all tracks and waypoints provided by Point Lay participants for the 2010 field season (April through September), 2011 field season (April through October), and 2012 field season (April through October). Although the majority of tracks are associated with offshore hunting activities, the map also includes snowmachine tracks associated with breaking trail or traveling to and from whaling camp, as well as tracks associated with other offshore activities such as search and rescue trips.

Participants' GPS tracks from 2010 extend along the Chukchi Sea coast from Point Hope north to Wainwright, and offshore up to approximately 10 miles. However, in the majority of cases, participants traveled no farther north than Utukok Pass and no farther south than Omalik Lagoon. Participants who traveled to Point Hope or Wainwright reported that such trips were infrequent, involved visiting relatives or friends, and necessitated an overnight stay in the host community. The 2011 GPS tracks extend from Cape Beaufort in the south to Icy Cape Pass in the north. The majority of tracks follow the barrier islands or the coast inside Kasegaluk Lagoon. Point Lay 2012 tracks are similar in distribution to 2011 extending from Icy Cape in the north to Omalik Lagoon in the south except for one trip to Cape Thompson. Offshore trips in 2011 and 2012 extend no farther than 20 miles into the Chukchi Sea.

Cross symbols on Map 54 through Map 56 indicate the location of waypoints collected or added during the downloading of the GPS data. Waypoints typically mark harvest locations or animal sightings, but may indicate anything the participant thought was noteworthy, such as whaling camp sites, locations of fish nets, and coastal landmarks. The majority of waypoints from the three study years are located in or offshore from Kasegaluk Lagoon between Kuchiak Creek and Utukok Pass, as well as near Icy Cape. Participants marked waypoints up to 10 miles offshore in 2010 and up to 20 miles offshore in 2011 and 2012, reflecting the greater distance they traveled offshore in 2011 and 2012 as compared to 2010. Point Lay participants marked relatively few waypoints for their harvests and wildlife sightings. It became apparent that the participants did not mark all of the waypoints for harvest, and thus the waypoint data in this report do not reflect the complete harvest or wildlife sightings. The low number of waypoints reflects the difficulty participants reported with recording waypoints at the time an animal is harvested due to the many actions that must be taken to quickly and efficiently harvest and butcher the resource.

Map 54: All Tracks and All Waypoints, Point Lay 2010 (April-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

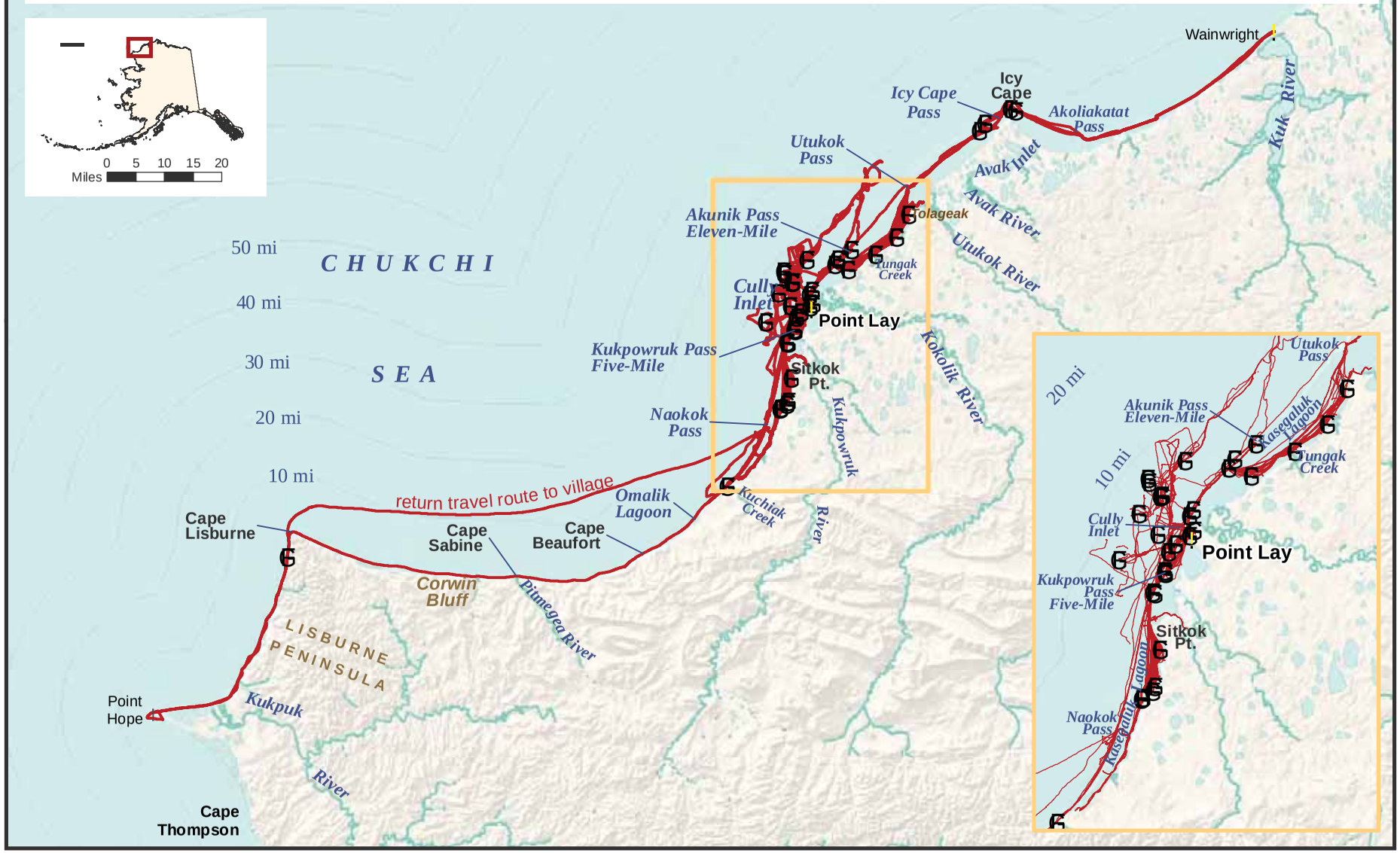
! study community

! other community

all waypoints including strike/harvest sites and other observations (38 points, 7 respondents)

all tracks including hunting, snowmachine and other tracks (83 tracks, 10 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 55: All Tracks and All Waypoints, Point Lay 2011 (April-October)

Stephen R. Braund & Associates
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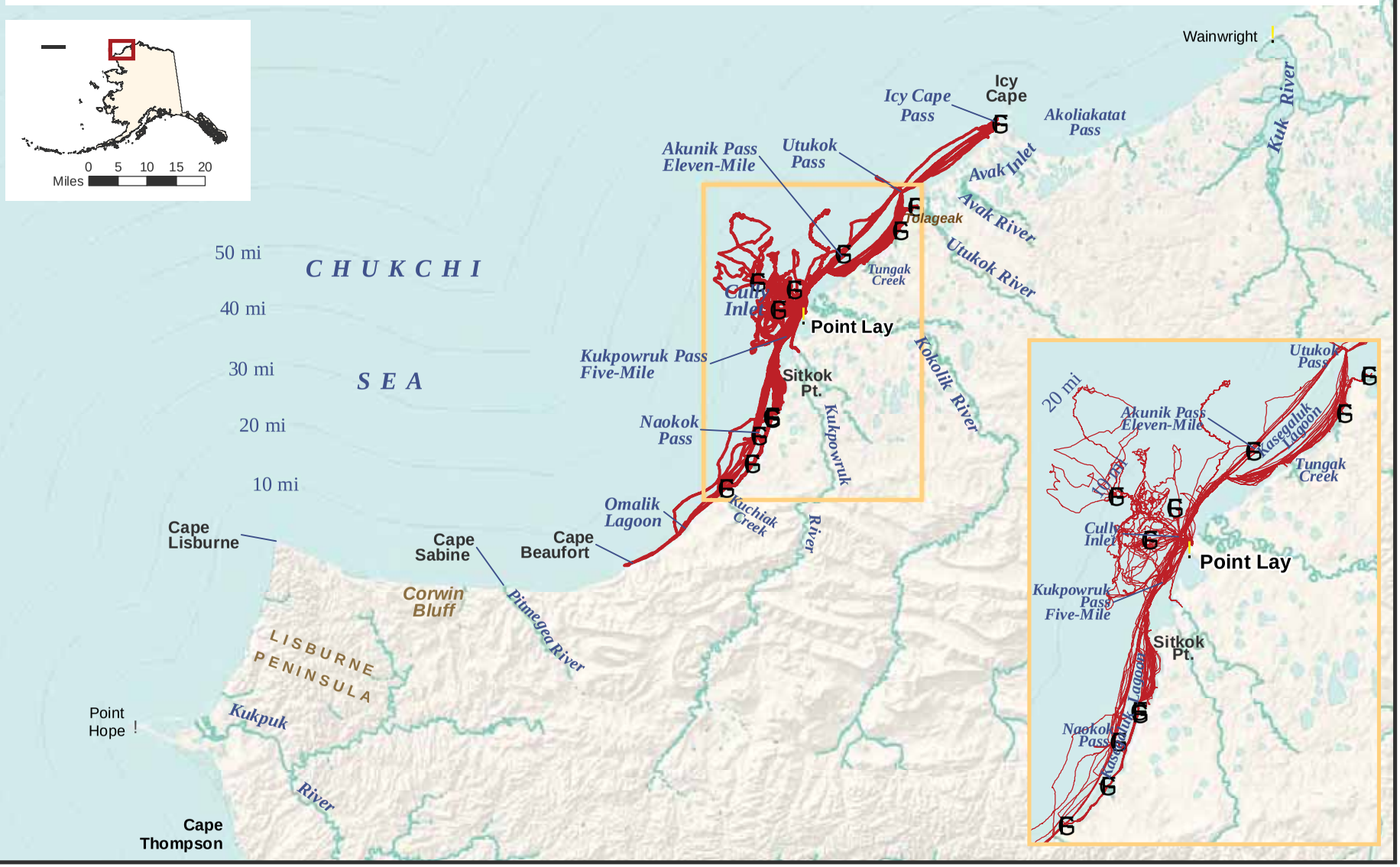
! study community

! other community

all waypoints including strike/harvest sites and other observations (12 points, 7 respondents)

all tracks including hunting, snowmachine and other tracks (106 tracks, 15 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 56: All Tracks and All Waypoints, Point Lay 2012 (April-October)

Stephen R. Braund & Associates
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(907) 276-8222 srba@alaska.net

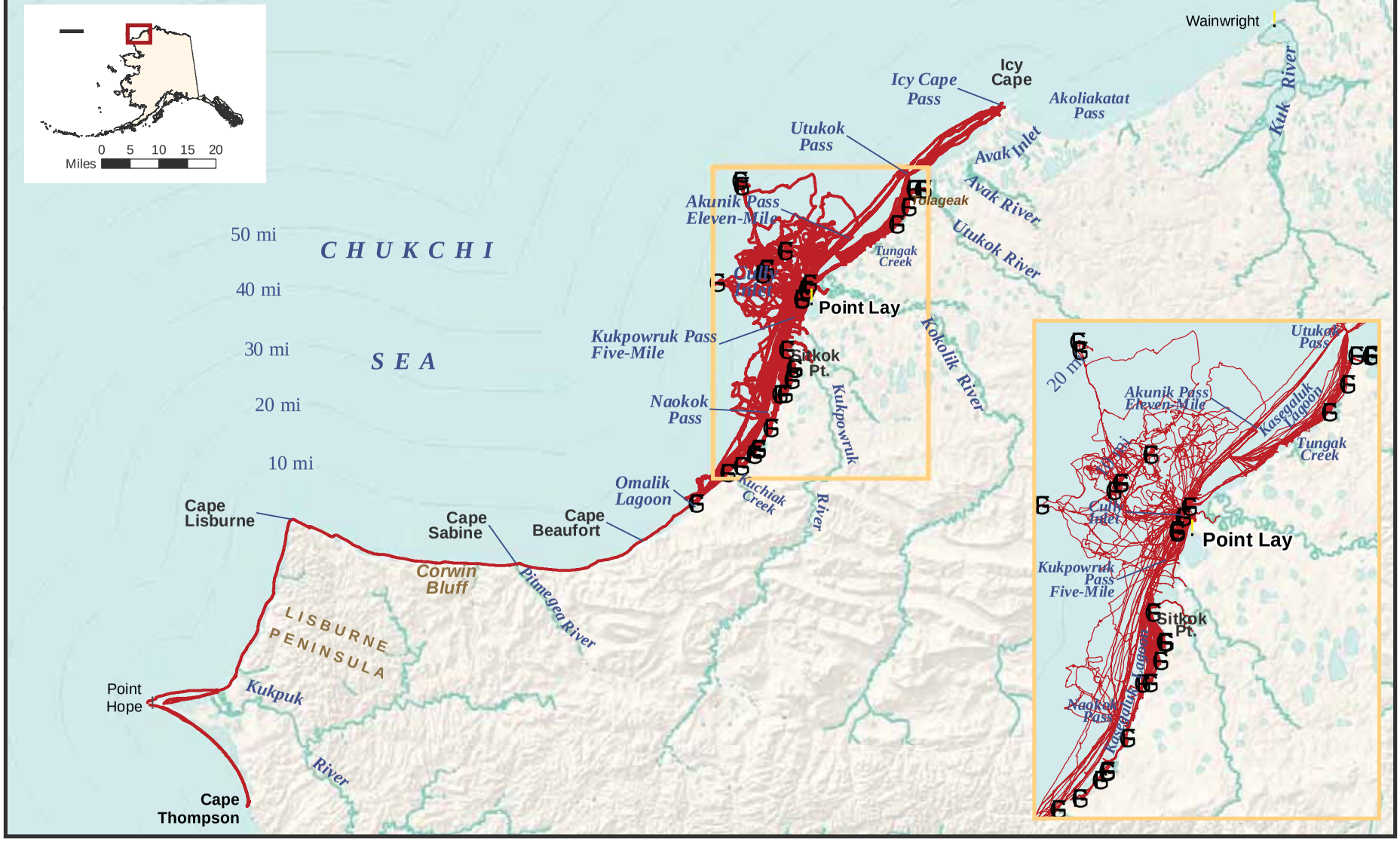
! study community

! other community

all waypoints including strike/harvest sites and other observations (29 points, 8 respondents)

all tracks including hunting, snowmachine and other tracks (134 tracks, 13 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Point Lay hunting tracks (not including snowmachine tracks to hunting areas or non-hunting tracks) for all resources are depicted on Map 57 through Map 59. In a few cases, participants reported that subsistence was not the main purpose of a trip. These trips were included if the participant indicated that subsistence-related activities (e.g., scouting for animals, opportunistic harvests) occurred during the trip. In 2010, hunting tracks extended from Point Hope in the south to Wainwright in the north, with the heaviest concentration of tracks in and around Kasegaluk Lagoon from its southernmost point north to Utukok Pass. This map shows Point Lay residents traveling throughout Kasegaluk Lagoon and offshore from Kasegaluk Lagoon at a distance of up to approximately 10 miles for bearded seal. In 2011 and 2012, study participants in Point Lay recorded similar extents of hunting trips north to Icy Cape and south to Omalik Lagoon. Many hunting trips were conducted along the barrier islands or in Kasegaluk Lagoon. In a few cases, participants traveled up to 22 miles offshore during spring bowhead whaling.

Map 60 through Map 62 show snowmachine tracks and boat tracks not associated with hunting. Snowmachine tracks are associated with breaking trail, checking on leads in the ice, or traveling to and from whaling camp. Boating trips not associated with hunting include search and rescue trips, recreational trips, walrus and caribou tagging trips in which the study participant was working in other scientific studies, testing outboard motor, or taking boats to other communities. In some cases, the field researcher was unable to ascertain the purpose of a trip for a number of reasons. Sometimes participants did not recall the specific purpose of the trip. Participants also occasionally reported that tracks on their GPS did not belong to them. In these cases, participants usually explained that they had loaned their GPS to a non-study participant (e.g., participant's son). The field researcher attempted to contact non-study participants with known tracks whenever possible, but recorded the trip purpose as "not ascertained" if contact was not made.

The following sections describe the locations of Point Lay participants' hunting activities by subsistence resource, season, and ocean ice conditions. These sections only include information associated with offshore hunting activity trips.

4.2.1.1 Seal Hunting Tracks

Point Lay 2010 through 2012 seal hunting tracks and harvest/strike waypoints are shown on Map 63 through Map 65. During the three study years, participants reported the majority of seal hunting tracks to the west of the community up to approximately 15 miles from shore. In all three years the farthest south that residents reported hunting seals was Omalik Lagoon, whereas the northern extent varied each year from Wainwright, Icy Cape, or Utukok Pass. The majority of tracks were identified for bearded seal, although spotted and ringed seal were also mentioned by participants. Several participants reported hunting multiple seal species simultaneously. June, July, and September were common months of seal hunting among all three years with April and August also mentioned in 2010. The seal hunting tracks represented on the three maps were recorded by five, seven, and eight participants respectively for the 2010, 2011, and 2012 years.

4.2.1.2 Bowhead Whale Hunting Tracks

In 2008, Point Lay became the 11th Alaska whaling community to resume traditional bowhead whaling, landing its first whale in over 70 years, in 2009 (Suydam, George, Rosa, Person, Hanns, and Sheffield 2009; SRB&A 2008). During all three study seasons, Point Lay residents engaged in spring whaling activities during April and May. While all whaling activity occurred during the spring for the 2010-2012 study years, the study team learned in 2009 during the pre-field planning for this project that Point Lay also attempted to harvest bowheads in the autumn of 2009. However, Point Lay participants have indicated that it is more difficult to go fall whaling, particularly if Kasegaluk Lagoon freezes. Also, Point

Map 57: Hunting Tracks, Point Lay 2010 (April-September)

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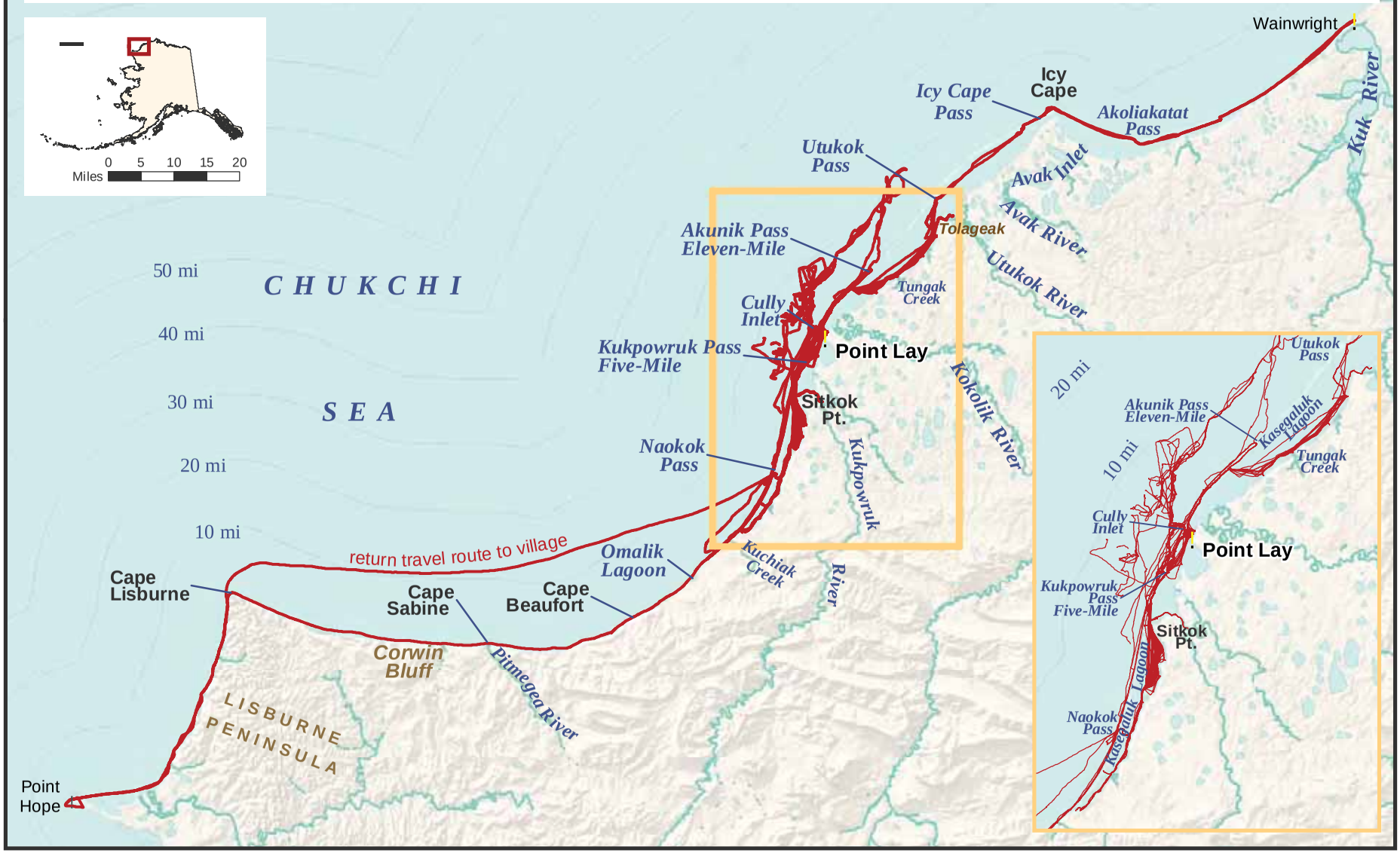
(907) 276-8222 srba@alaska.net

! study community
! other community

hunting tracks
(52 boat tracks representing 53 hunting trips, 10 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 58: Hunting Tracks, Point Lay 2011 (May-October)

Stephen R. Braund & Associates
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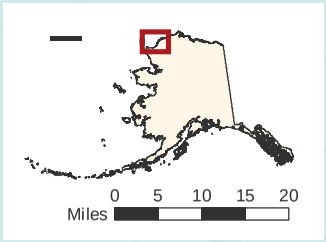
(907) 276-8222 srba@alaska.net

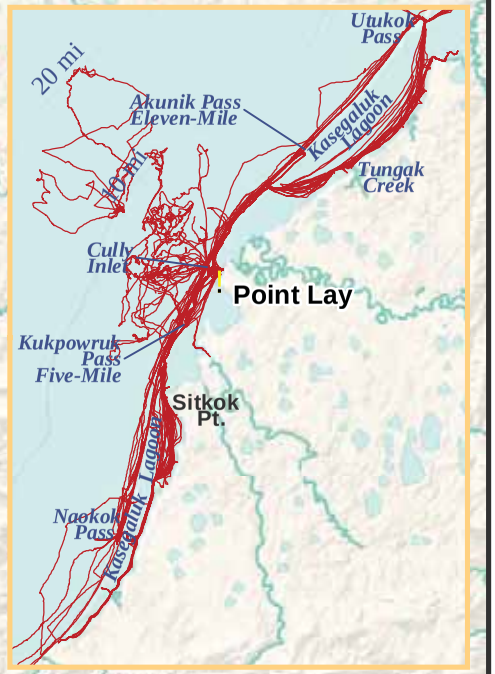
! study community
! other community

hunting tracks
(62 boat tracks representing 70 hunting trips, 13 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Kuk River
Utukok Pass
Avak Inlet
Avak River
Utukok River
Akunik Pass
Eleven-Mile
Tolageak
Tungak Creek
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Kokolik River
50 mi
40 mi
30 mi
20 mi
10 mi
C H U K C H I
S E A
Sitkok Pt.
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
L I S B U R N E
P E N I N S U L A
Point Hope !



Map 59: Hunting Tracks, Point Lay 2012 (April-October)

Stephen R. Braund & Associates
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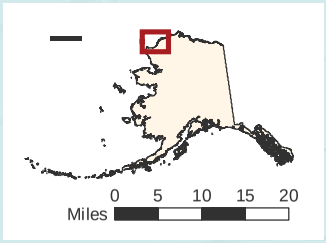
(907) 276-8222 srba@alaska.net

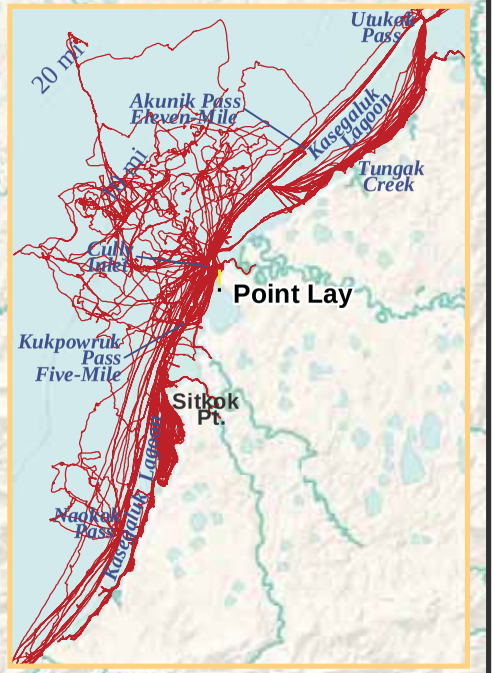
! study community
! other community

hunting tracks
(112 boat tracks representing 117 hunting trips, 12 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Kuk River
Utukok Pass
Avak Inlet
Avak River
Utukok River
Akunik Pass
Eleven-Mile
Tolageak
Tungak Creek
Culp Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Kokolik River
Sitkok Pt.
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River
50 mi
40 mi
30 mi
20 mi
10 mi
C H U K C H I
S E A
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
L I S B U R N E
P E N I N S U L A
Point Hope !



Map 60: Snowmachine Tracks and Other Tracks, Point Lay 2010 (April-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

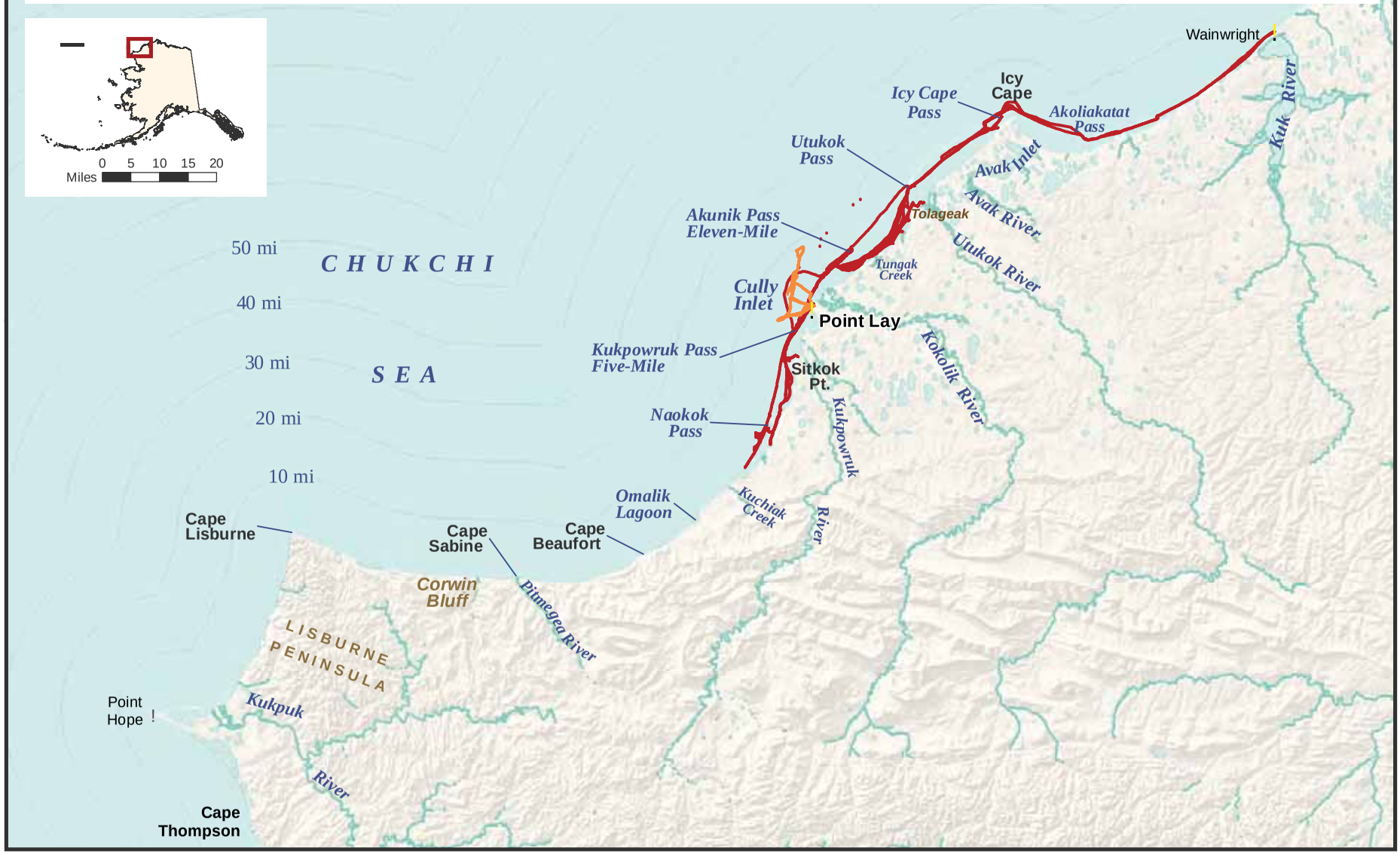
! study community

! other community

snowmachine tracks (15 tracks, 3 respondents)

other tracks (16 tracks, 6 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 61: Snowmachine Tracks and Other Tracks, Point Lay 2011 (April-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

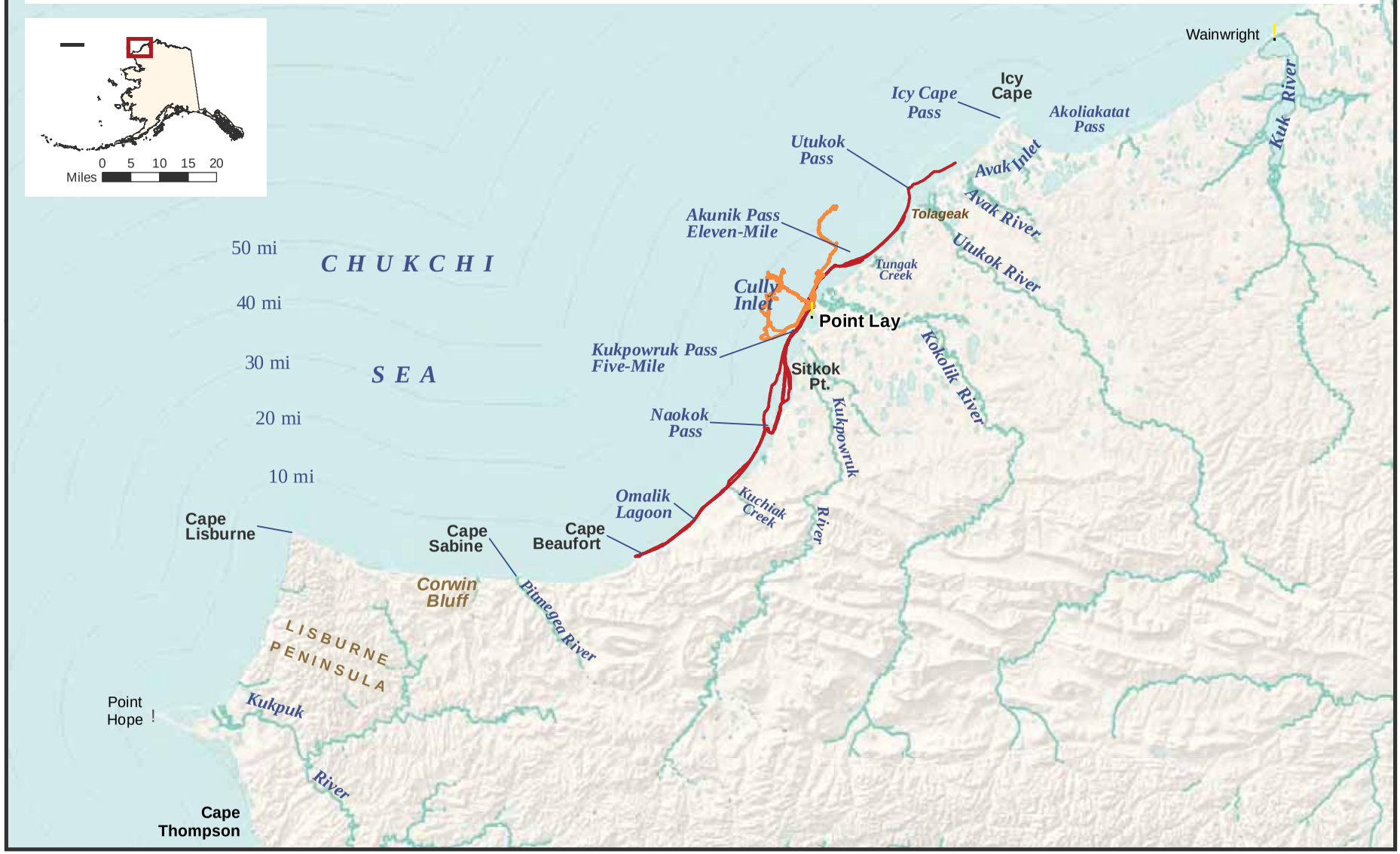
! study community

! other community

snowmachine tracks (33 tracks, 7 respondents)

other tracks (11 tracks, 4 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 62: Snowmachine Tracks and Other Tracks, Point Lay 2012 (April-May and August-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

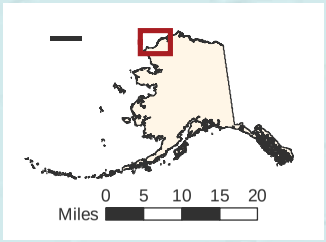
! study community

! other community

snowmachine tracks (17 tracks, 5 respondents)

other tracks (5 tracks, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Kuk River
Utukok Pass
Avak Inlet
Avak River
Tolageak
Akunik Pass
Eleven-Mile
Utukok River
Tungak Creek
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Kokolik River
Sitkok Pt.
Kukpowruk River
Naokok Pass
Omalik Lagoon
Kuchiak Creek
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
LISBURNE PENINSULA
Point Hope
Kukpuk River
Cape Thompson
50 mi
40 mi
30 mi
20 mi
10 mi
CHUKCHI SEA

Map 63: Seal Hunting Tracks, Point Lay 2010 (April and June-September)

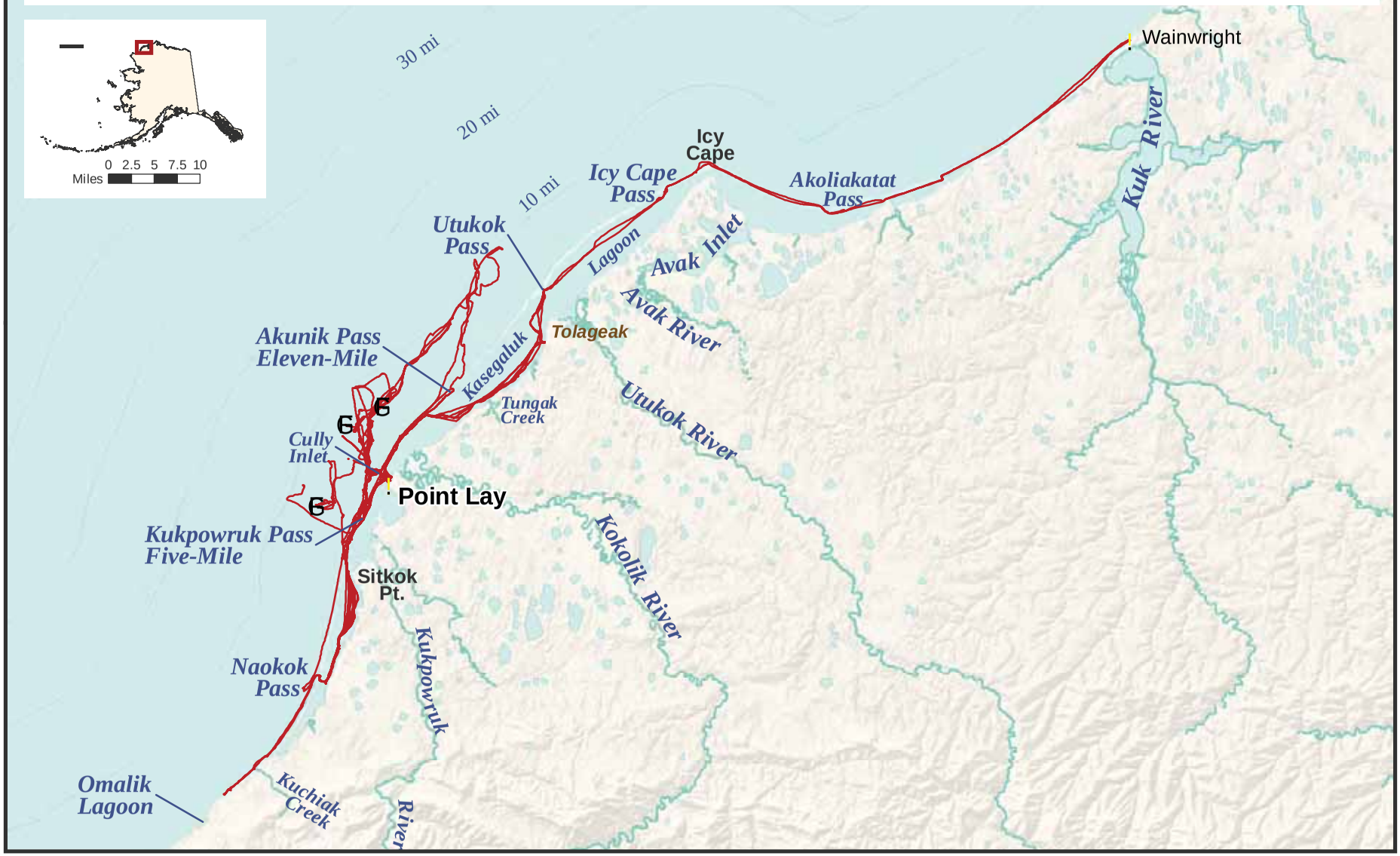
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

bearded and spotted seal hunting tracks
(22 boat tracks representing 22 hunting trips, 5 respondents)

G seal harvest sites (3 points, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 64: Seal Hunting Tracks, Point Lay 2011 (June-July and September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

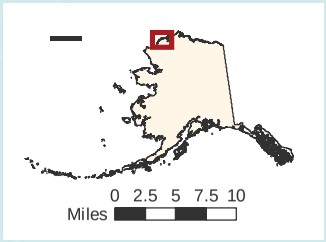
! study community

bearded, ringed, spotted, and unspecified seal hunting tracks
(21 boat tracks representing 21 hunting activity trips, 7 respondents)

G seal harvest sites (3 points, 3 respondents)

* seal strike site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



30 mi
20 mi
10 mi
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Wainwright
Kuk River
Utukok Pass
Lagoon
Avak Inlet
Avak River
Akunik Pass
Eleven-Mile
Tolageak
Kasegaluk
Tungak Creek
Utukok River
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Sitkok Pt.
Kokolik River
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River

Map 65: Seal Hunting Tracks, Point Lay 2012 (June-July and September)

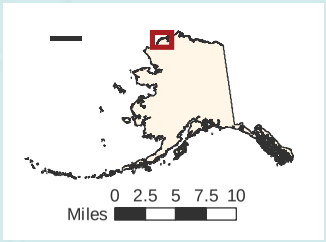
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

bearded and spotted seal hunting tracks
(28 boat tracks representing 29 hunting trips, 8 respondents)

G seal harvest site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



30 mi
20 mi
10 mi
Icy Cape
Icy Cape Pass
Akoliakatat Pass
! Wainwright
Kuk River
Utukok Pass
Lagoon
Avak Inlet
Avak River
Akunik Pass
Eleven-Mile
Kasegaluk
Tolageak
Tungak Creek
Utukok River
Cutlip Inlet
G
Point Lay
Kukpowruk Pass
Five-Mile
Sitkok Pt.
Kokolik River
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River

Lay had a quota of one bowhead whale per year, and if they harvest a whale in the spring, they do not try to harvest one in the fall.

Map 66 through Map 68 show bowhead whaling tracks, harvest/strike waypoints, and associated snowmachine tracks for the three study years. In 2010, three primary snowmachine trails are evident on Map 66 and extend to a lead located approximately five miles offshore from the barrier islands. In 2011, a series of snowmachine tracks extend directly from Point Lay to a lead located approximately 10 miles offshore from the community. Participants also broke a series of trails south to Kukpowruk Pass that also end at the lead, and a third series of trails north approximately 20 miles from Point Lay. In 2012, Point Lay participants recorded one primary snowmachine trail directly west of the community that led to a lead approximately 10 miles offshore.

During the three study years, three to five participants reported bowhead whaling tracks. In 2010, the lead was approximately five miles offshore directly west of the community and bowhead whale hunting activities occur within that lead in an area extending from 10 miles south and 10 miles north of Point Lay. Ice and weather conditions prevented Point Lay from being able to harvest a bowhead during 2010.

In 2011, all bowhead whaling trips occurred in May, with the associated trail breaking to whaling camps occurring in April and May. Participants indicated that the location of whaling activities change from year to year and 2011 and 2012 whaling tracks show such a change from the previous 2010 season. During these two study years, bowhead whaling occurred farther west of the community in leads from 10 to 20 miles offshore. Residents reported that in past years whaling activities may have occurred as far north as Utukok Pass.

Although Point Lay residents attempted to harvest a bowhead whale in 2010, they were unsuccessful (Suydam et al. 2010). Point Lay successfully harvested a bowhead whale in the spring of 2011 (Suydam et al. 2011); however, there is no track associated with this harvest because the crew forgot to bring their GPS on the harvest trip. Point Lay also harvested a whale in the spring of 2012 (Suydam et al. 2012). This harvest location is depicted on Map 68.

4.2.1.3 Walrus Hunting

During the January 2012 community review meeting, Point Lay residents reported that the community also participates in walrus hunting, primarily during the month of June. During the 2010 and 2011 study seasons, no Point Lay participant reported a walrus hunting track or harvest. During the meeting, one participant said that he had gone walrus hunting but had forgotten to turn on his GPS. One meeting attendee said that the community had not seen walrus on the ice in five to six years. In 2012, participants reported three trips for walrus hunting. These trips are all located within Kasegaluk Lagoon and extend north of the community to Icy Cape Pass (Map 69).

4.2.1.4 Beluga Whale Hunting Tracks

Beluga hunting tracks and harvest waypoints are depicted on Map 70 through Map 72. Point Lay residents undertake an annual beluga harvest in June or July each year. Similar to Wainwright hunters, the Point Lay annual beluga hunt is a communal activity. To locate the beluga, several scouts will head out from the community sticking close to the shoreline areas looking for the herd migrating along the coast. Once participants locate the beluga pod, they herd the pod into Kasegaluk Lagoon directly in front of Point Lay for easier harvest in shallow waters. Usually, the community will herd them through Five-Mile or Eleven-Mile Pass. The general herding route as well as the community harvest site were identified during the November 2013 community review meeting and are shown on Map 70 through Map 72. In 2010, five GPS tracks from three individuals indicate that participants traveled between Omalik Lagoon and Tolageak while scouting for beluga. In 2011, eight participants recorded 13 tracks while hunting or scouting for beluga (Map 71). During 2011 participants traveled adjacent to the barrier islands from Omalik Lagoon to Icy Cape Pass while scouting for beluga. Ten participants hunted in a similar extent in

Map 66: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Point Lay 2010 (April-May)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

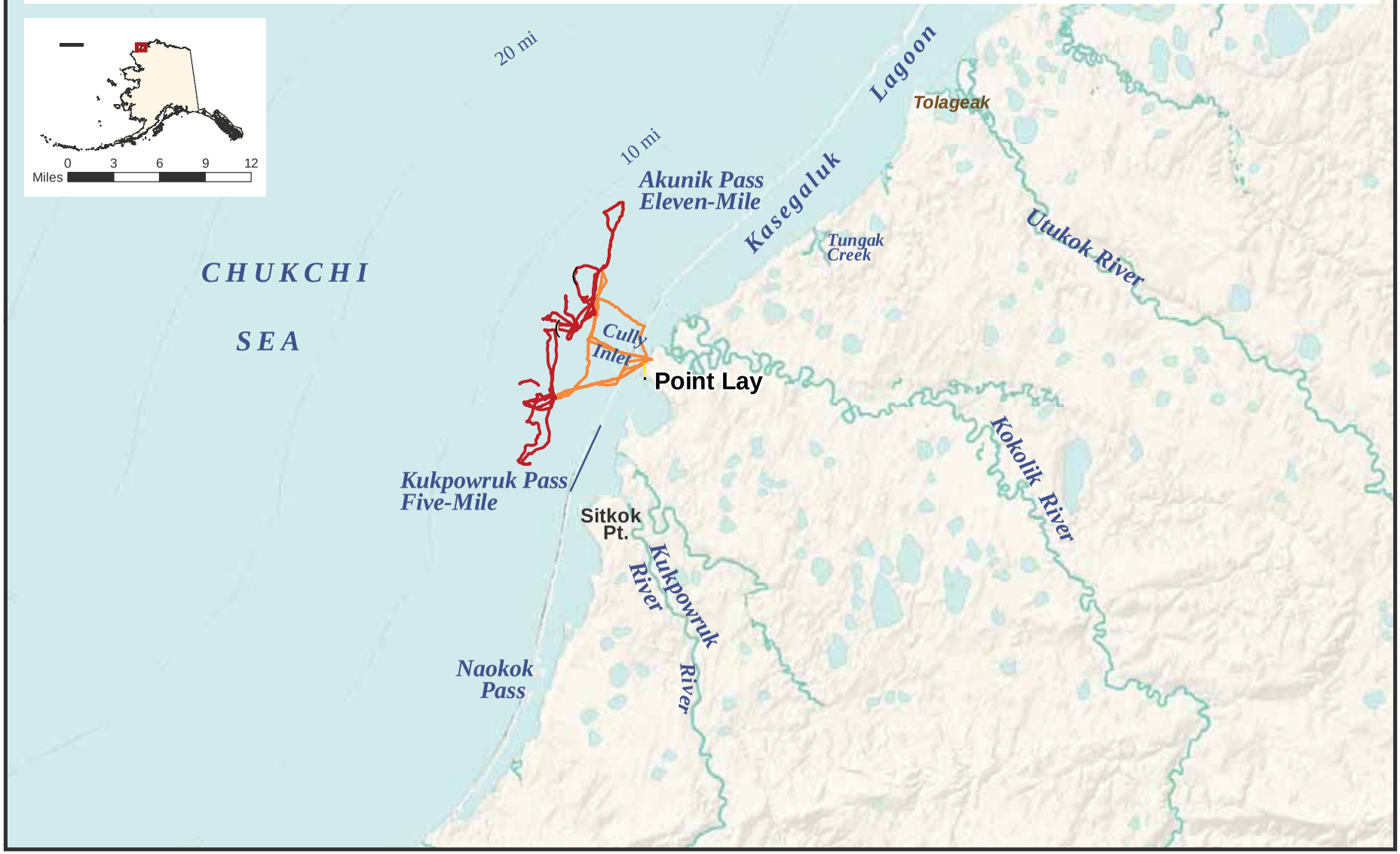
! study community

snowmachine tracks (15 tracks, 3 respondents)

bowhead whaling tracks (7 boat tracks representing 7 hunting trips, 3 respondents)

(bowhead sightings

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 67: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Point Lay 2011 (April-May)

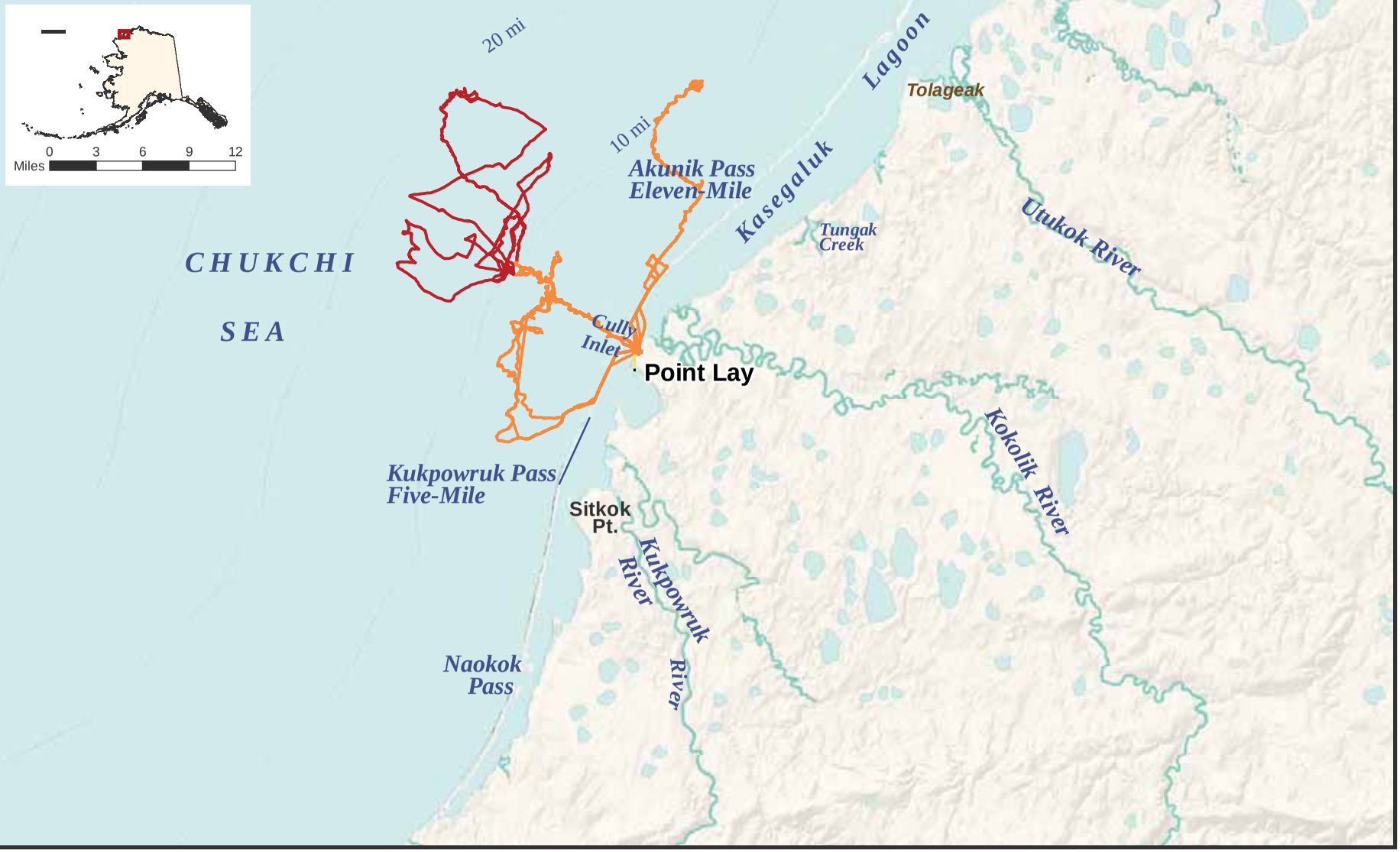
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

snowmachine tracks (33 tracks, 7 respondents)

bowhead whaling tracks (4 boat tracks representing 8 hunting trips, 5 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 68: Bowhead Whaling Tracks and Associated Snowmachine Tracks, Point Lay 2012 (April-May)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

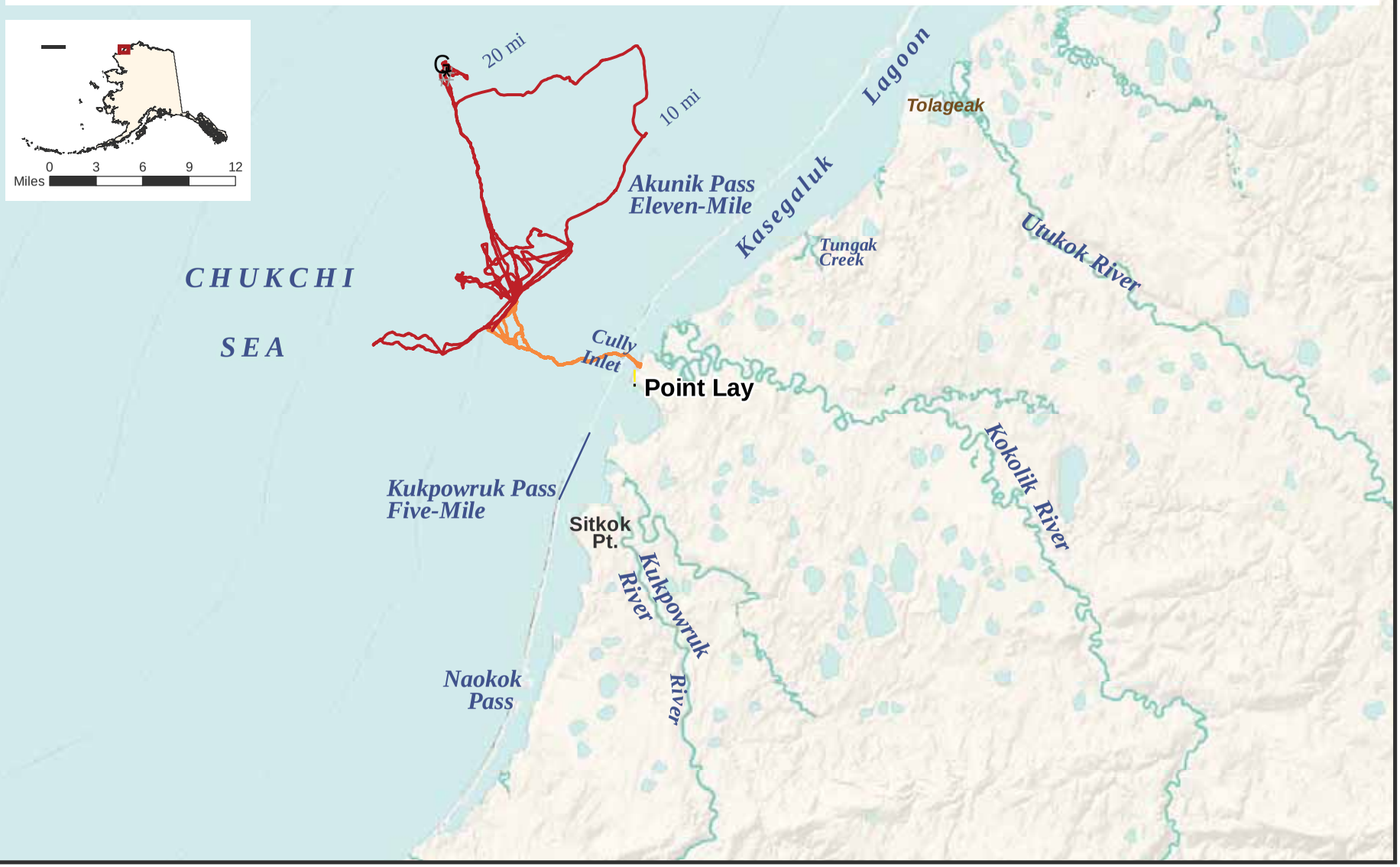
snowmachine tracks (17 tracks, 5 respondents)

bowhead whaling tracks (8 boat tracks representing 9 hunting trips, 4 respondents)

G bowhead harvest site (1 point, 1 respondent)

bowhead strike site (1 point, 1 respondent)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 69: Walrus Hunting Tracks, Point Lay 2012 (September-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

walrus hunting tracks
(3 boat tracks representing 3 hunting trips, 2 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

Map 70: Beluga Hunting Tracks, Point Lay 2010 (June-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

beluga hunting tracks (5 boat tracks representing 5 hunting trips, 3 respondents)

successful beluga herding route (2013 community review meeting)

G beluga harvest site (1 point, 1 respondent)

community beluga harvest site (22 belugas harvested, 2013 community review meeting)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

Map 71: Beluga Hunting Tracks, Point Lay 2011 (June-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

beluga hunting tracks (13 boat tracks representing 16 hunting trips, 8 respondents)

successful beluga herding route (2013 community review meeting)

community beluga harvest site (23 belugas harvested, 2013 community review meeting)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

Map 72: Beluga Hunting Tracks, Point Lay 2012 (June-July)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

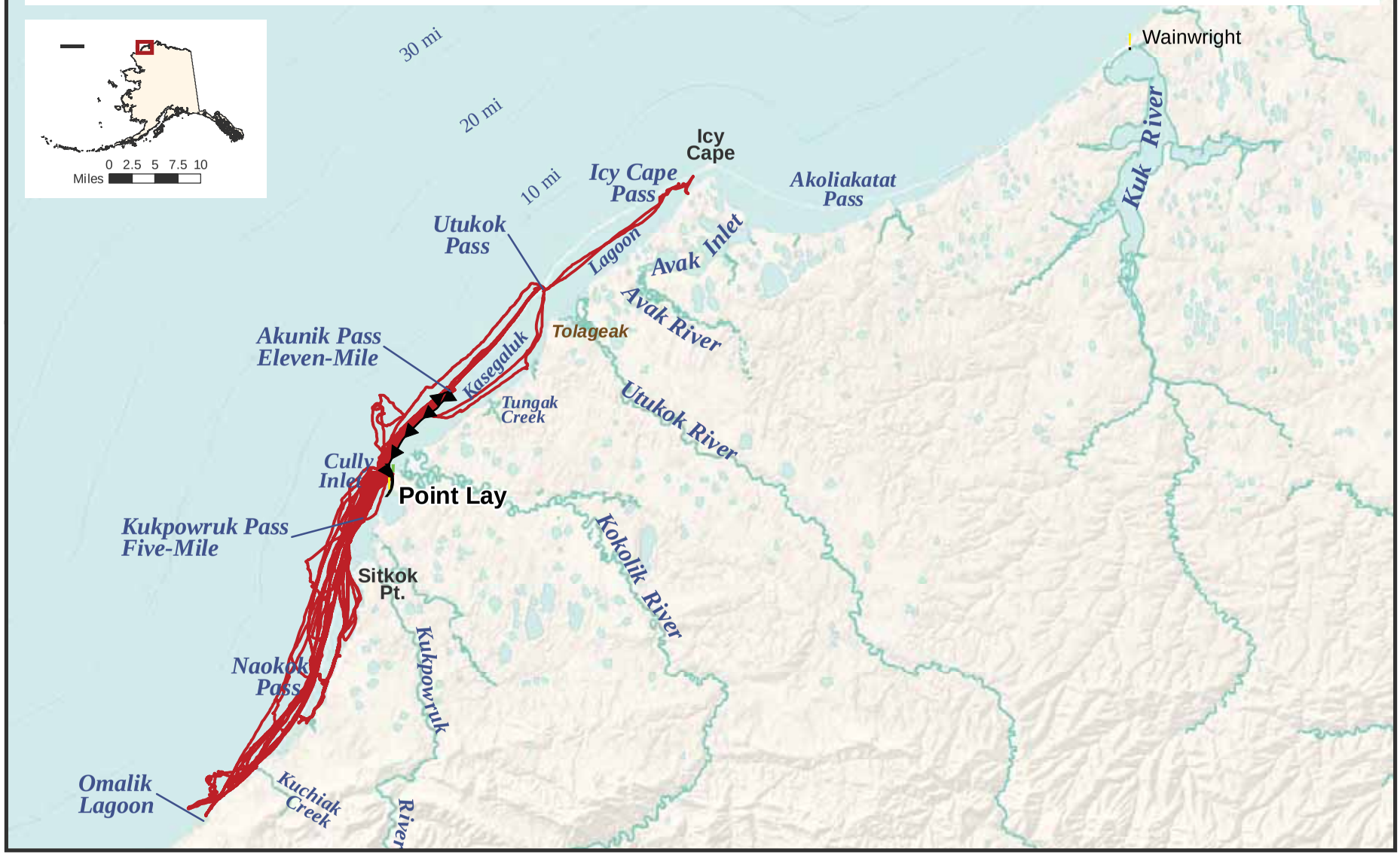
! study community

beluga hunting tracks (24 boat tracks representing 24 hunting trips, 10 respondents)

successful beluga herding route (2013 community review meeting)

community beluga harvest site (14 belugas harvested, 2013 community review meeting)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



2012 to that of their 2011 beluga hunting areas which were primarily located in Kasegaluk Lagoon between Icy Cape and Omalik Lagoon (Map 72). In all three study years, participants' beluga hunting activities generally occurred within a few miles from shore, primarily within Kasegaluk Lagoon.

4.2.1.5 Caribou Hunting Tracks

Although marine mammals are the primary focus of the study, the study team collected information for other offshore subsistence activities. Map 73 through Map 75 show where participants traveled offshore and harvest waypoints while hunting caribou from the coast in the three study years. During all three study years, Point Lay's offshore caribou hunting activities occurred primarily within Kasegaluk Lagoon from the southernmost point of the lagoon north to Icy Cape Pass. Tracks are also present just outside the lagoon on the ocean side of the barrier islands, where caribou can sometimes be found. Caribou hunting along the coast occurred from June through October with the months of July, August, and September being the three months present in all three study years. In 2010, one participant also reported scouting for caribou along the coast during a trip to Point Hope; the return trip was located up to 15 miles from shore and, while shown on Map 73, was not associated with caribou hunting. Point Lay hunters also search for and harvest caribou inland; these activities are not addressed in this study.

4.2.1.6 Waterfowl and Egg Hunting Tracks

Participants recorded very few waterfowl and egg hunting tracks and harvest waypoints during the three study years; all tracks associated with these activities are shown on (Map 76). In 2010, one participant reported egg harvesting inside Kasegaluk Lagoon. In 2011, one participant reported harvesting eiders in May and June. Both trips occurred immediately outside Cully Inlet, 10 miles or less from Point Lay. While eiders were harvested, they were not a targeted species. The participant was hunting bowhead whales in May and bearded seal in June when he harvested the eiders. In 2012, participants searched for eggs in Kasegaluk Lagoon and reported targeting eiders in an area 10 to 20 miles offshore, again during spring bowhead whaling activities.

4.2.1.7 Fish and Berry Harvesting Tracks

Map 77 through Map 79 show fish and berry harvesting tracks for 2010, 2011, and 2012. The 2010 and 2011 tracks show that participants travelled south through Kasegaluk Lagoon towards Naokok Pass via boat during June through August in 2010 and July through September in 2011 to reach their berry picking and fishing areas either on the mainland or on the barrier islands. One participant traveled south of Naokok Pass to pick berries in 2010. In 2012, residents' berry picking activities continued in a similar pattern to 2010 and 2011 and were all located south of Point Lay inside Kasegaluk Lagoon. Unlike 2010 and 2011, participants reported fishing tracks extending north of the community in Kasegaluk Lagoon towards Utukok River. Fishing tracks also extended to the southern terminus of Kasegaluk Lagoon. These 2012 activities occurred in July and August. Participants reported fishing activities for several species of salmon, herring/smelt, and trout.

4.2.1.8 Wildlife Sightings

Map 80 shows the 17 locations of wildlife sightings as recorded by five Point Lay participants during offshore trips or added during the downloading of the GPS data in 2010. Participants reported the majority of their recorded wildlife sightings for walrus, caribou, and bowhead. Point Lay participants also reported single observations of spotted seal, bearded seal, loon, moose, and bear during their offshore hunting trips. Following the 2010 field season the wildlife sighting information was reviewed with the community of Point Lay. Residents indicated that the maps were not accurate in reporting all wildlife sightings and that it was not practical for participants to try and mark a waypoint for all wildlife sightings. Thus, wildlife sightings were removed from the data collection efforts in 2011 and 2012.

Map 73: Caribou Hunting Tracks, Point Lay 2010 (July-September)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

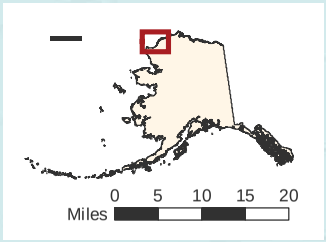
caribou hunting tracks (18 boat tracks representing 19 hunting trips, 5 respondents)

G caribou harvest sites (2 points, 1 respondent)

(caribou sightings

* during the caribou hunting trip to Point Hope a respondent harvested a Dall sheep*

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Utukok River

Akunik Pass Eleven-Mile

Tolageak

G

Tungak Creek

Cully Inlet

! Point Lay

Kukpowruk Pass Five-Mile

Sitkok Pt.

Kokolik River

Naokok Pass

Kukpowruk River

50 mi

40 mi

30 mi

20 mi

10 mi

C H U K C H I

S E A

return travel route to village

Omalik Lagoon

Kuchiak Creek

Cape Lisburne

Cape Sabine

Cape Beaufort

Corwin Bluff

Pitmegea River

L I S B U R N E P E N I N S U L A

Point Hope

Map 74: Caribou Hunting Tracks, Point Lay 2011 (July-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

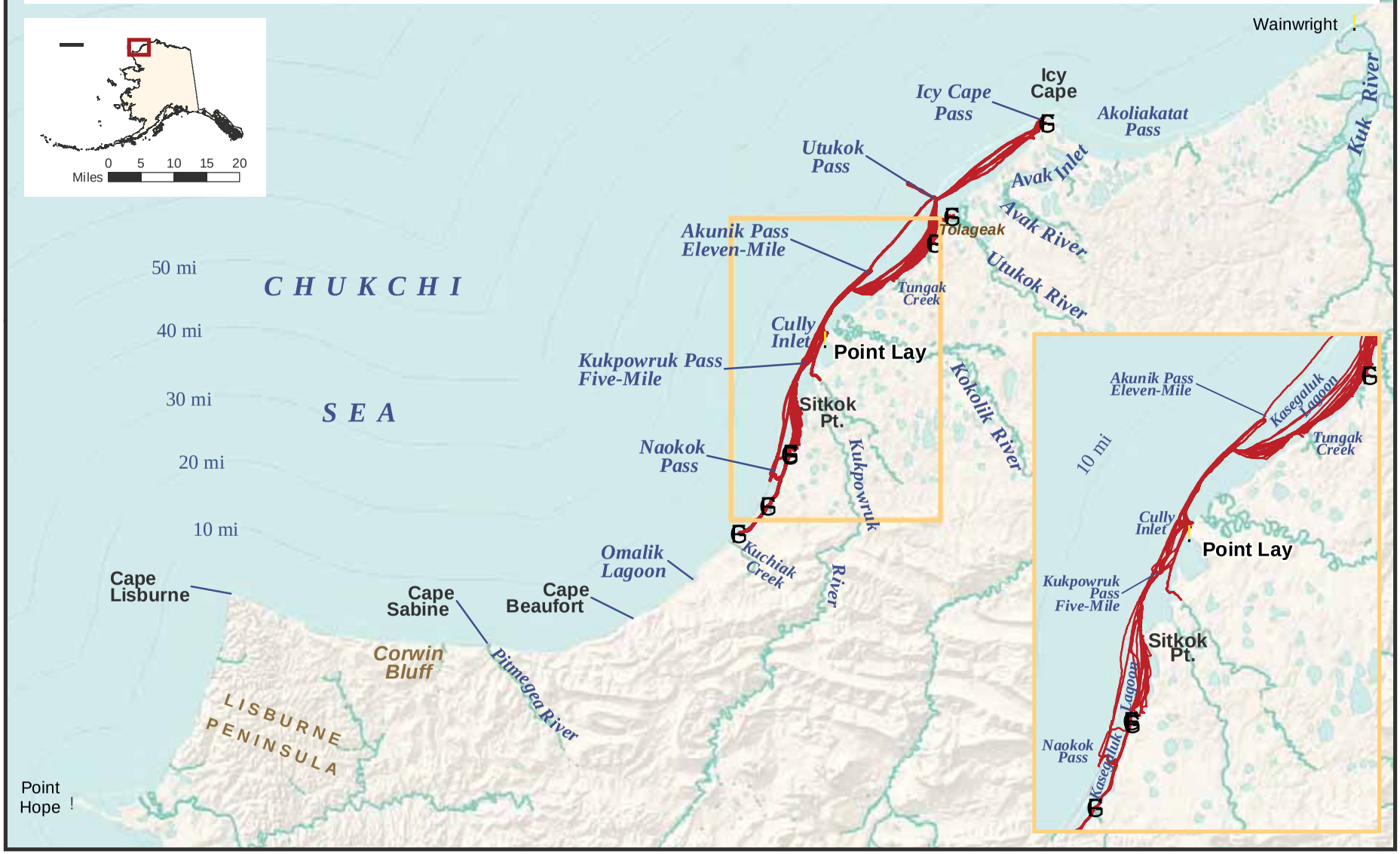
! study community

! other community

caribou hunting tracks
(23 boat tracks representing 23 hunting trips, 8 respondents)

G caribou harvest sites (7 points, 5 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 75: Caribou Hunting Tracks, Point Lay 2012 (June-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

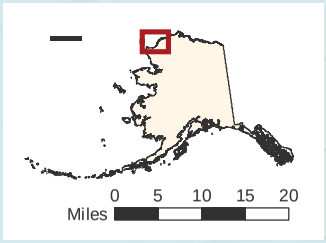
! study community

! other community

caribou hunting tracks
(43 boat tracks representing 47 hunting trips, 10 respondents)

G caribou harvest sites (16 points, 6 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Tolageak

Akunik Pass Eleven-Mile

Utukok River

Tungak Creek

Cully Inlet

Point Lay

Kukpowruk Pass Five-Mile

Sitkok Pt.

Kokolik River

Naokok Pass

Kukpowruk River

50 mi

40 mi

30 mi

20 mi

10 mi

CHUKCHI SEA

Omalik Lagoon

Kuchiak Creek

Cape Lisburne

Cape Sabine

Cape Beaufort

Corwin Bluff

Pitmegea River

LISBURNE PENINSULA

Point Hope !

Map 76: Waterfowl Hunting and Egg Harvest Tracks, Point Lay 2010-2012 (April-June)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

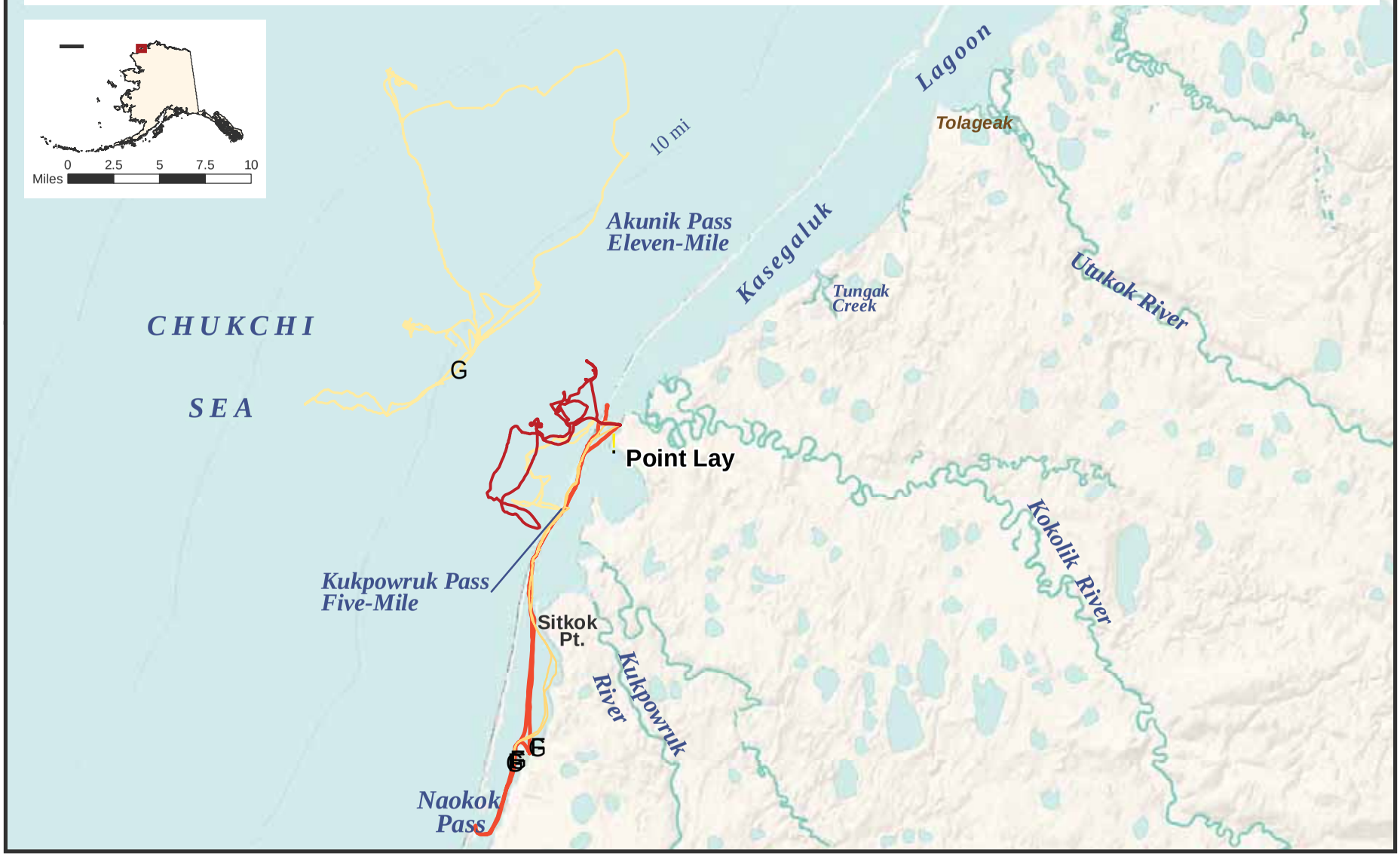
egg track (2010) waterfowl track (2011) egg track (2012) waterfowl track (2012)

! study community

(8 boat tracks representing 9 hunting trips, 3 respondents)

G harvest sites (4 points, 3 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 77: Fishing and Berry Harvest Tracks, Point Lay 2010 (June-August)

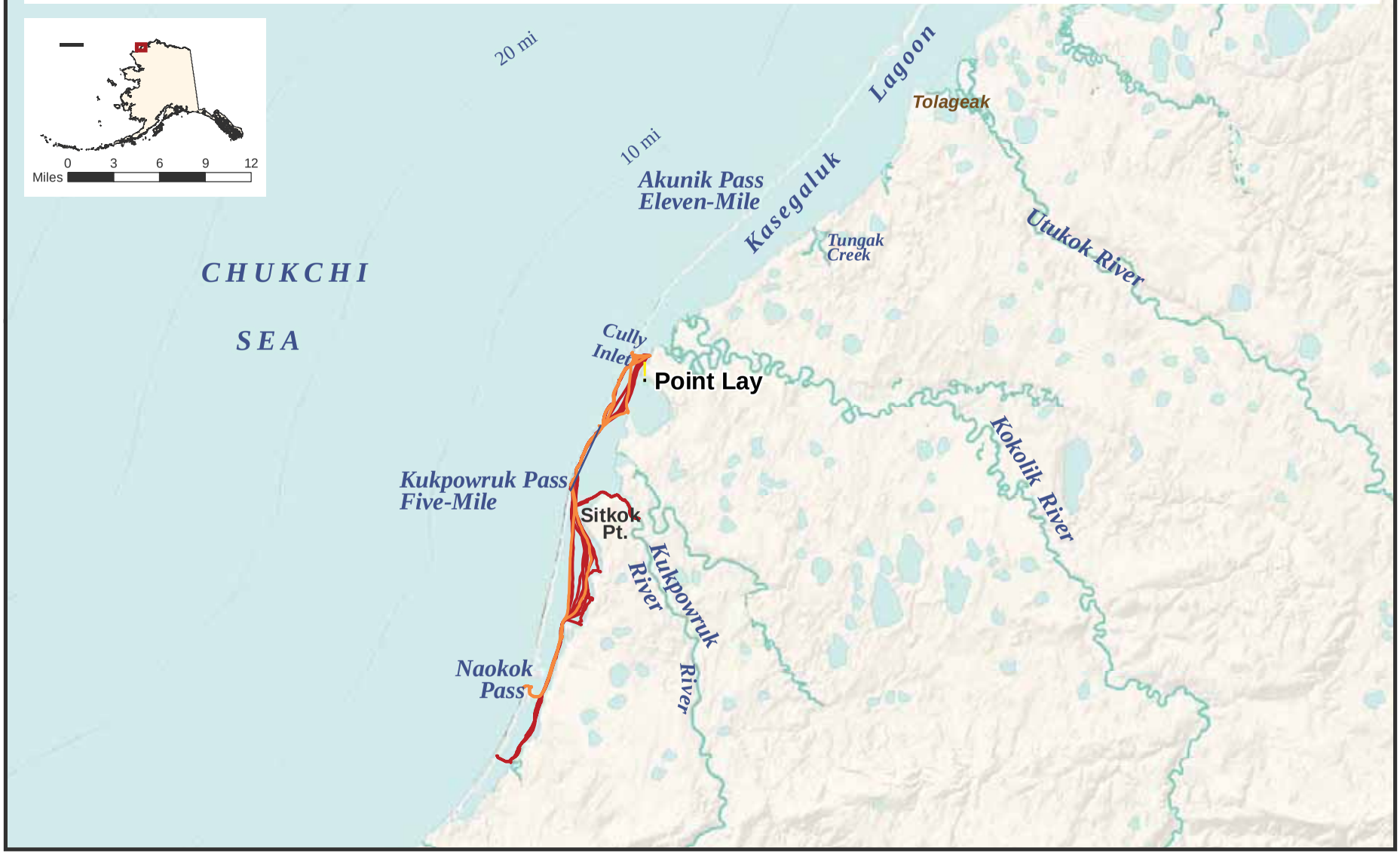
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

fishing track berry track

(8 boat tracks representing 8 hunting trips, 3 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 78: Fishing and Berry Harvest Tracks, Point Lay 2011 (July-September)

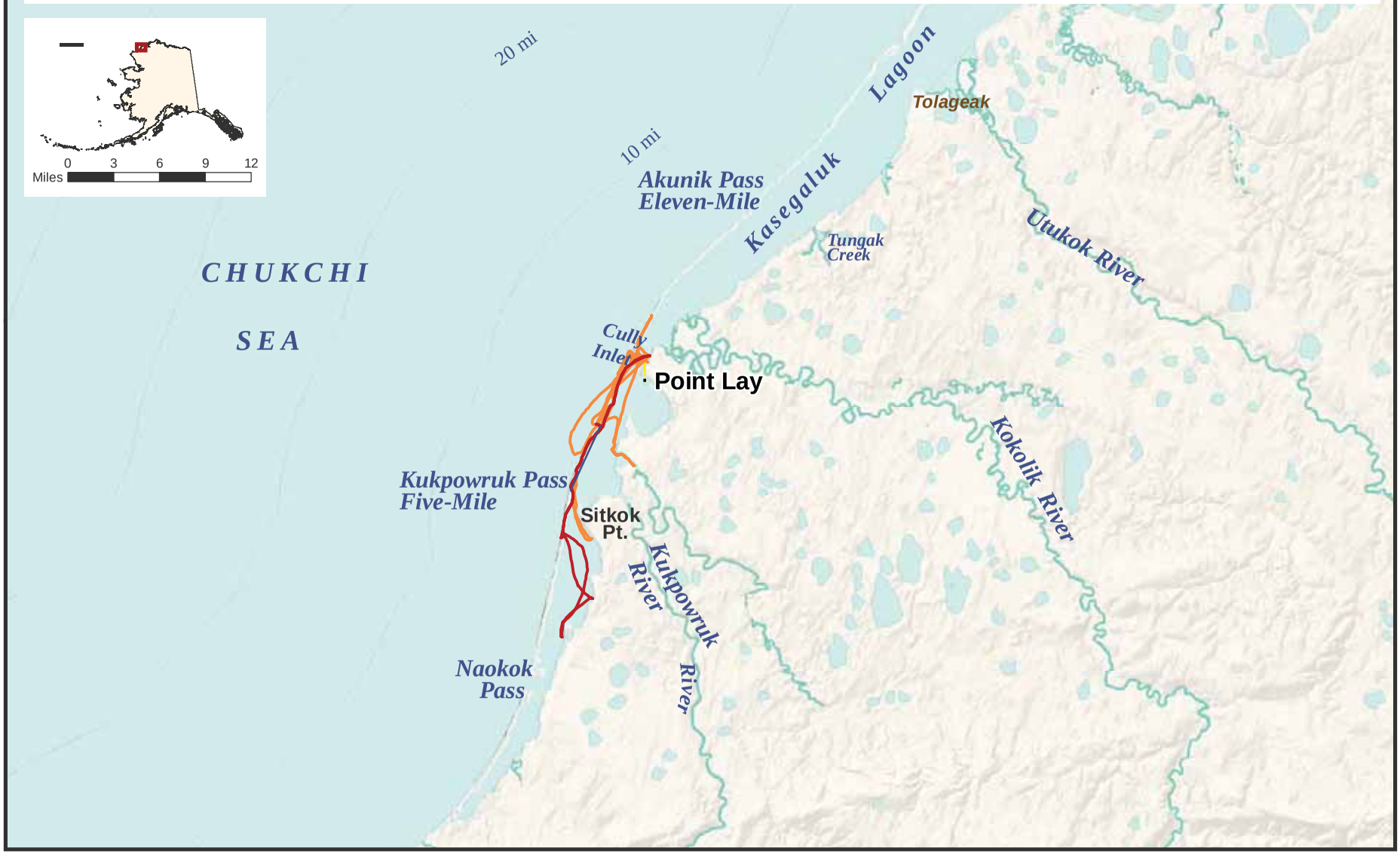
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

fishing track berry track

(7 boat tracks representing 7 hunting trips, 4 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 79: Fishing and Berry Harvest Tracks, Point Lay 2012 (July-August)

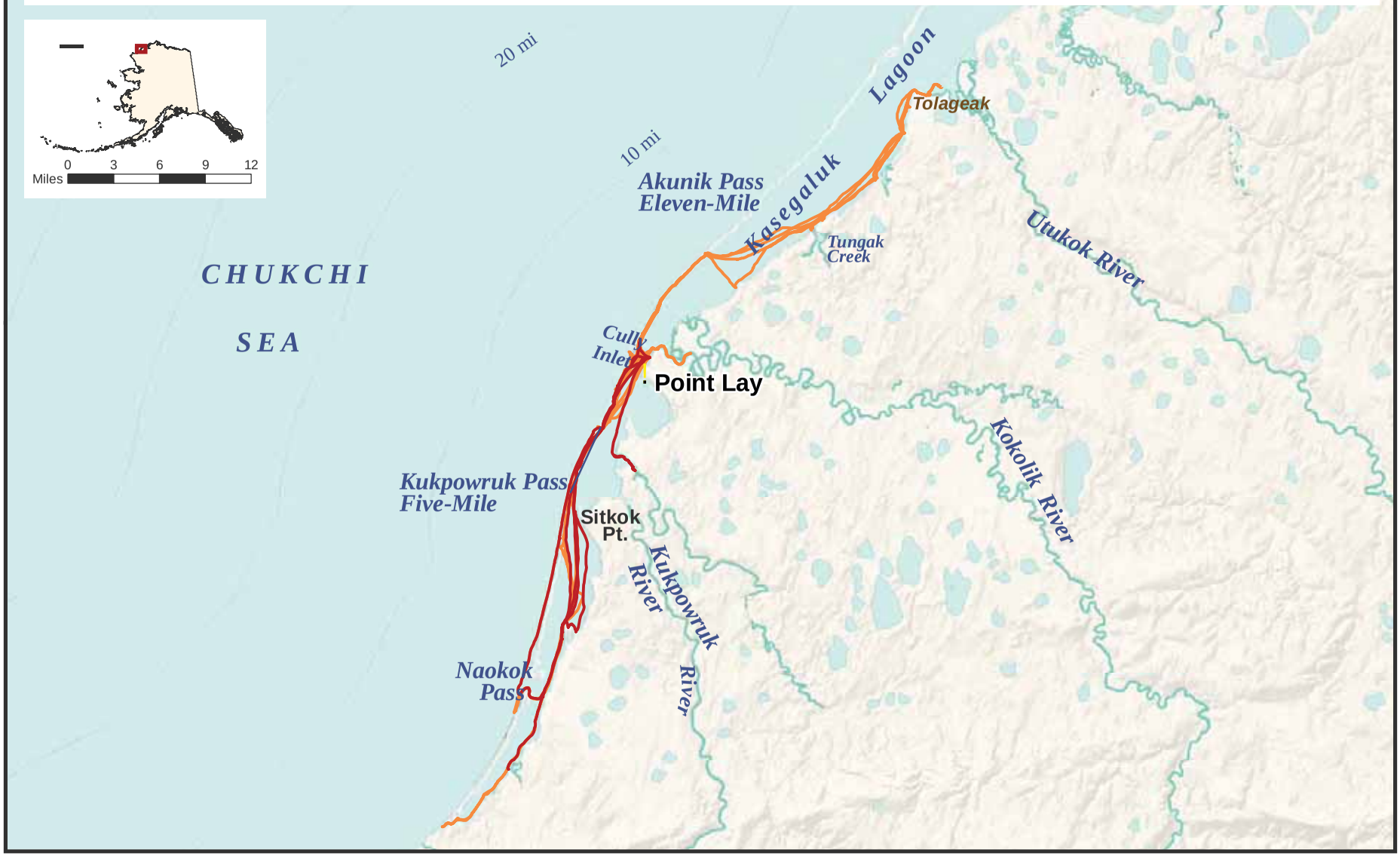
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

fishing track berry track

(24 boat tracks representing 26 hunting trips, 6 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 80: Wildlife Sightings, Point Lay 2010 (April-September)

Stephen R. Braund & Associates
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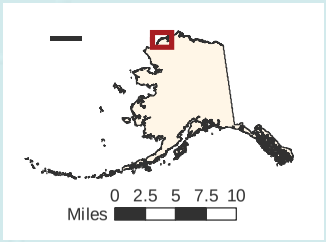
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

(wildlife sightings (17 points, 5 respondents) (

species sighted include: bowhead, walrus, spotted seal, bearded seal, loon, moose, caribou and bear

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



30 mi
20 mi
10 mi
Wainwright
Kuk River
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Utukok Pass
Lagoon
Avak Inlet
Avak River
Tolageak
Akunik Pass
Eleven-Mile
Kasegaluk
Tungak Creek
Utukok River
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Kokolik River
Sitkok Pt.
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River

4.2.1.9 Harvest Sites

Point Lay participants marked waypoints to denote the locations of resource harvests or strikes or added these waypoints during the downloading of the data. The harvest and strike waypoints depicted on Map 81 through Map 83 represent only a portion of the total offshore harvests for 2010 through 2012. Ten, 11, and 20 harvest/strike sites reported by Point Lay participants are displayed for the 2010, 2011, and 2012 field seasons. Harvest locations are located offshore from Point Lay and at several locations in Kasegaluk Lagoon Participants identified harvest site locations for beluga whales, bearded seal, spotted seal, caribou, sheep, eggs, and berries. Caribou, berry, Dall sheep, and egg harvest locations are located on the coast. As previously mentioned, the current study was not a systematic subsistence harvest assessment in the communities, and the harvest data (including harvest locations) presented in this report are not representative of the entire community's harvests.

4.2.2 Participant Harvests

Table 36 provides the number and percentage of offshore hunting activity trips by target species for the three study years. Point Lay participants targeted bearded seals and coastal caribou during offshore trips more frequently than any other species during the 2010 through 2012 boating seasons. The field researcher obtained a total of 19 to 46 trips (31 to 39 percent) in which the participant identified hunting coastal caribou as a target species. Bearded seal accounted for 21 to 39 percent of hunting trips during the three study years, however the number of trips for bearded seal showed less variation (17 to 25) and the changes in percentages reflect increased trips for other resources (e.g., fish in 2012) than a decrease in bearded seal efforts. Beluga was the third most frequently reported target species with eight trips (14 percent) in 2010, sixteen trips (23 percent) in 2011, and 24 trips (21 percent) in 2012.

Table 36: Point Lay Hunting Activity Trip Purpose

Target Species	Number of Trips 2010	Number of Trips 2011	Number of Trips 2012
Bearded seal	22 (39%)	17 (24%)	25 (21%)
Beluga	8 (14%)	16 (23%)	24 (21%)
Bowhead	7 (12%)	8 (11%)	9 (8%)
Fish	4 (7%)	4 (10%)	23 (20%)
Spotted seal	0 (0%)	3 (4%)	2 (2%)
Unspecified Seal	0 (0%)	2 (3%)	1 (1%)
Ringed seal	0 (0%)	2 (3%)	0 (0%)
Walrus	0 (0%)	0 (0%)	3 (3%)
Eiders	0 (0%)	0 (0%)	2 (2%)
Caribou	19 (33%)	22 (31%)	46 (39%)
Berries	4 (7%)	2 (3%)	2 (2%)
Dall sheep	1 (2%)	0 (0%)	0 (0%)
Eggs	1 (2%)	0 (0%)	0 (0%)
Total Number of Trips	57	70	117
[1]See Table 39 for number of resources harvested during 2010, 2011, and 2012 hunting activity trips.			

Stephen R Braund & Associates, 2013.

Map 81: Harvest Sites, Point Lay 2010 (April and June-September)

Stephen R. Braund & Associates
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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

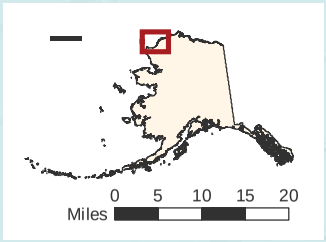
! study community

! other community

harvest sites (10 points, 5 respondents)

harvested species include: beluga, bearded seal, spotted seal, caribou, sheep, eggs and berries

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Tolageak

Akunik Pass

Eleven-Mile

Utukok River

Tungak Creek

50 mi

C H U K C H I

Cully Inlet

40 mi

Point Lay

Kukpowruk Pass

Five-Mile

Kokolik River

30 mi

S E A

Sitkok Pt.

Kukpowruk River

Naokok Pass

20 mi

10 mi

Omalik Lagoon

Kuchiak Creek

Cape Lisburne

Cape Sabine

Cape Beaufort

Corwin Bluff

Pitmegea River

L I S B U R N E

P E N I N S U L A

Point Hope !

Map 82: Strike and Harvest Sites, Point Lay 2011 (June-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

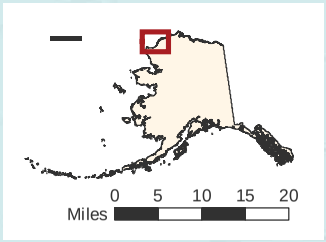
! study community
! other community

G harvest sites (10 points, 6 respondents)

* strike site (1 point, 1 respondent)

harvested species include: bearded seal, spotted seal, unspecified seal, and caribou

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 83: Strike and Harvest Sites, Point Lay 2012 (May-August)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

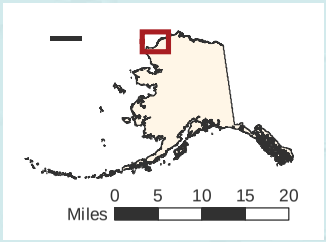
! other community

G harvest sites (19 points, 7 respondents)

* strike site (1 point, 1 respondent)

harvested species include: bearded seal, bowhead, caribou, and unspecified eider

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



The large increase in beluga trips was due to the fact that more participants recorded GPS tracks for their beluga trips in 2011 and 2012 than they did in 2010. Bowhead whale was also frequently reported as a target species; participants targeted bowhead on seven, eight, and nine trips in the respective study years. Except for 23 trips for fish in 2012, all other target species had four or fewer trips. Participants make many short trips inside the lagoon to harvest various fish species; in 2012 the study participants recorded these trips with more consistency than in previous years and this explains the large increase in the number of reported fishing trips from four in 2010 and 2011 to 23 in 2012.

Table 37 provides a frequency distribution of the species Point Lay participants reported harvesting during hunting trips. Harvest amounts for the three study years show considerable variation. Recorded beluga harvests decreased in each of the three study years from 15 to 12 to five belugas. This decrease coincides with overall lower harvest numbers reported for the entire community during those same three years (see Goodwin 2013, 2012, and 2011 and discussion below). On the other hand, bearded seal harvests numbers increased from three to eight to 10 during the three study years. Caribou harvests increased as well and this increase is likely due to a large increase in the caribou population near Point Lay over the 2010 year, which several participants attributed to the closure of a coal mine located approximately 30 miles south of the community. A large number of fish harvests (e.g., salmon, herring/smelt) were also recorded in 2012 compared to previous years. However, as discussed above this was due to increased reporting by study participants rather than an increase in resource availability or hunter effort. Bowhead harvests were accurately reported for the 2010 and 2012 study years. In 2011, the community successfully harvested a spring bowhead whale; however, this harvest was not documented because the participant forgot to bring their GPS during the successful bowhead trip.

Table 37: Point Lay Species Harvested during Hunting Activity Trip

Subsistence Resource	Number Harvested		
	2010	2011	2012
Beluga[1]	22	23	14
Bearded seal	3	8	10
Seals	0	1	0
Spotted seal	1	1	0
Bowhead[2]	0	1	1
Caribou	2	19	36
Dall sheep	1	0	0
Herring/Smelt	30	0	13
Salmon	0	0	53
Flounder	0	0	19
Trout	0	0	15
Berries[3]	1	0	3
Eiders	0	7	26
Eggs	24	0	30

[1]As reported by Goodwin 2013, 2012, and 2011
[2]As reported by Suydam et al. 2012, 2011, and 2010
[3]Berries represents gallons harvested.

Stephen R Braund & Associates, 2013.

The Point Lay annual beluga harvest provides an example of why the harvest data do not represent the community as a whole. The field researcher was present in Point Lay during the 2010 beluga harvest and learned from multiple participants that a total of 15 vessels attempted to participate in the hunt. Approximately half of these vessels broke down at the beginning of the hunt and were thus not able to fully participate; the number of trips (eight) listed for beluga in Table 36 reflects participants' observations that only half of the vessels attempting to participate in the hunt were able to do so. Point Lay residents harvested a total of 22, 23, and 14 belugas during the 2010, 2011, and 2012 harvests (Goodwin 2013, 2012, and 2011) as compared to the 15, 12, and five belugas recorded in this study as harvested during the same three years. Each participant was asked to report only what his or her boat struck and harvested and not what the community harvested. Several Point Lay residents have boats but declined to participate in the COMIDA study; thus, this study did not capture the total number of beluga harvested or the full number of the community's beluga hunting tracks.

4.2.3 Timing of Hunting Activities

The following section presents a summary of hunting tracks by month for the 2010, 2011, and 2012 seasons in Point Lay. Each map shows all recorded snowmachine or boating tracks for one or more months. Maps are arranged by month in order to facilitate comparisons of travel and harvest activity by month across study years. Table 38 provides the frequency and percentage distribution of hunting trips by departure month for all three years. The marine mammal migration and long summer days make June, July, and August months of high activity for offshore subsistence hunting; these three months accounted for approximately 80 percent of all hunting activity trips (Table 38). Annual variation in weather, wind speed, wind direction, and the presence/absence of ice also play a role in when and how many times community members conduct offshore subsistence hunting trips. This section also shows figures which provide a further breakdown of hunting activities by month by adding target species and harvested species as additional variables. Specifically, these figures show the number of trips by reported primary target and harvested species.

Table 38: Point Lay Month of Trip Departure

Month	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
April	7 (12%)	0 (0%)	4 (3%)
May	1 (2%)	8 (11%)	6 (5%)
June	19 (33%)	15 (21%)	27 (23%)
July	15 (26%)	29 (41%)	53 (45%)
August	12 (21%)	12 (17%)	17 (15%)
September	3 (5%)	5 (7%)	6 (5%)
October	0 (0%)	1 (1%)	4 (3%)
Total	100%	100%	100%
Number of Trips	57	70	117
Chi-Square p=.012			

Stephen R. Braund & Associates, 2013.

4.2.3.1 2010

4.2.3.1.1 April and May

In 2010, participants made their first offshore trips in April. Participants began to break trail on the shorefast ice for spring whaling in April. As whaling season drew near, participants set up camps at the edge of shorefast ice where ice leads appeared approximately five miles offshore, hauling boats, food, and other supplies to their camps in preparation for the hunt. When a lead opened and participants judged conditions to be favorable for whaling, they launched their boats into the lead from camp. These early trips were primarily bowhead whale hunting trips, although participants did report targeting and harvesting bearded seals during this time (Figure 11). By the beginning of May, bowhead hunting was ending and unsafe shorefast sea ice conditions limited snowmachine and boat travel. Participants reported no successful offshore harvests during this month. As shown on Map 84, the majority of bowhead whale hunting occurred in April and accounted for 12 percent of all trips reported that year (Table 38). Whaling crews, however, continued to travel by boat in search of bowhead in open leads into the month of May (two percent of 2012 trips) (Table 38). Map 84 shows 23 hunting tracks for all resources from April and May 2010, along with associated snowmachine tracks to hunting areas, reported by three participants. The farthest offshore hunting activities were documented at approximately six miles in April and eight miles in May. Because the primary offshore activities in April and May are associated with bowhead whale hunting, Map 84 is similar to the 2010 bowhead whale hunting track map (Map 66).

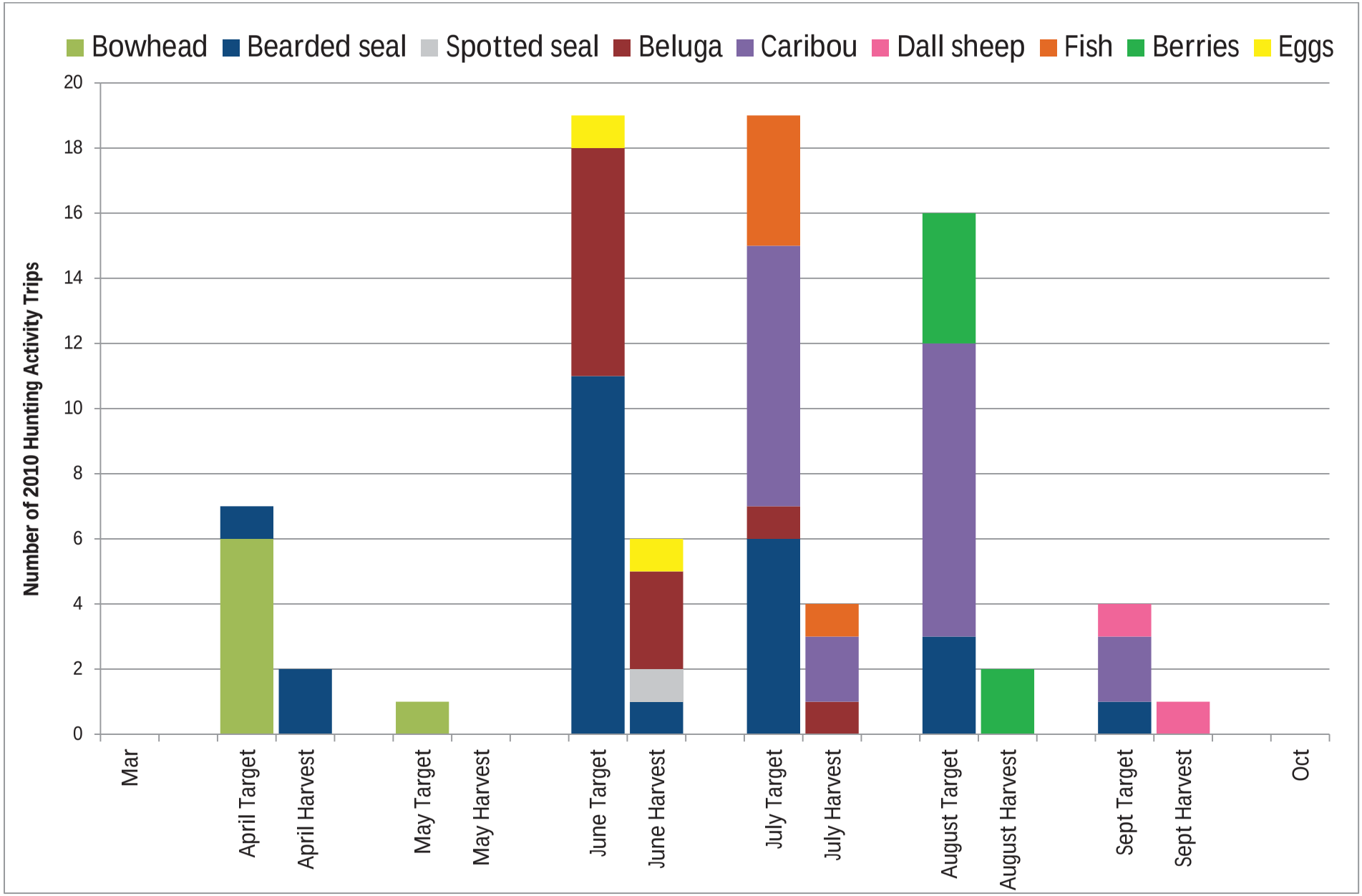
4.2.3.1.2 June and July

Hunting activity trips peaked in June with the beginning of the open water season and the annual beluga hunt. Residents also began hunting bearded seals in June, an activity that also peaked in June but continued, though with diminishing frequency, through September (Figure 11). Point Lay participants also began targeting and harvesting caribou in July. Targeted and/or harvested resources during June and July also included spotted seals, fish, and eggs. Eight participants recorded 29 boat tracks in June and July (Map 85). Participants' hunting activities during June and July extended along the coast between Kuchiak Creek and Wainwright and offshore up to 10 miles during June. June hunting tracks are focused farther offshore while July hunting tracks are limited to no more than three miles offshore primarily in Kasegaluk Lagoon and along the coastline. These two months accounted for the majority of 2010 offshore hunting activity at approximately 60 percent of all trips (Table 38).

4.2.3.1.1 August and September

Participants hunted caribou along the coast beginning in July, continuing into August and September. Although bearded seal and caribou were identified as targeted species in August and September, participants did not report successful harvests of either species. While participants most frequently reported hunting coastal caribou and bearded seal, and harvesting berries during these months, one participant harvested a Dall sheep on a return trip from Point Hope (Figure 11). Map 86 shows 15 August and September hunting trips which represent 26 percent of all trips reported in 2010 (Table 38). August and September hunting activities occurred south of the community and relatively close to shore (i.e., within three miles) and include one trip to Point Hope. Cooler, shorter days in September froze Kasegaluk Lagoon and halted all offshore boating activity by the end of the month. Counting dates of departure and separate dates of return, Point Lay participants reported a total of 57 trips during 56 calendar days between April 22 and September 6, 2010.

Figure 11: Point Lay 2010 Trips by Primary Target Species and Harvest Species and Month



Map 84: April and May Hunting Tracks and Associated Snowmachine Tracks, Point Lay 2010

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(907) 276-8222 srba@alaska.net

! study community

April hunting track

snowmachine track

May hunting track

8 boat tracks representing 8 hunting trips
15 snowmachine tracks
3 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

Map 85: June and July Hunting Tracks, Point Lay 2010

Stephen R. Braund & Associates
P.O. Box 1480
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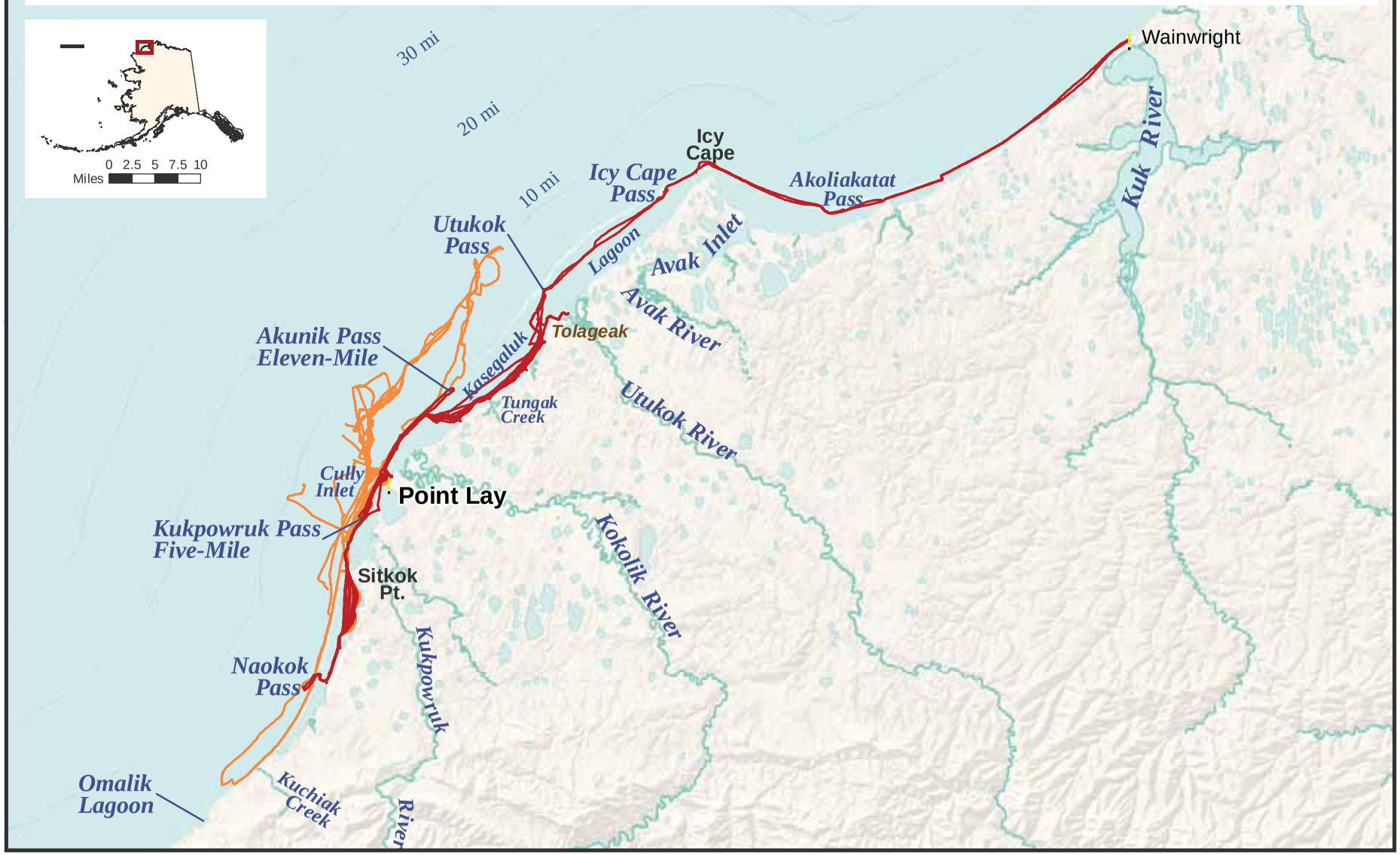
(907) 276-8222 srba@alaska.net

! study community

July hunting track
June hunting track

29 boat tracks representing 30 hunting trips
8 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 86: August and September Hunting Tracks, Point Lay 2010

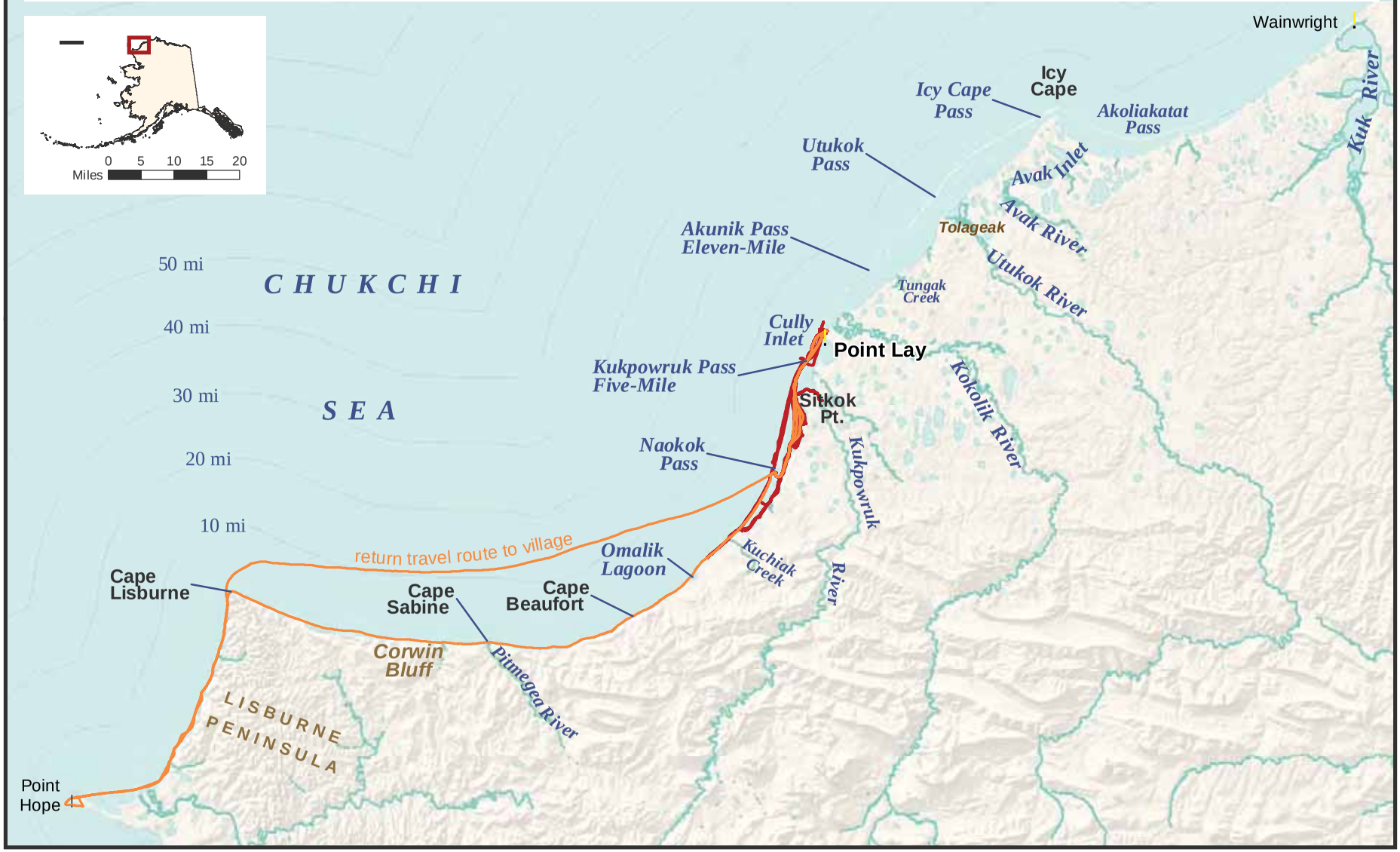
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

August hunting track
September hunting track

15 boat tracks representing 15 hunting trips
6 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



4.2.3.2 2011

4.2.3.2.1 May

In 2011, participants began boating offshore in May. Participants targeted bowhead whale during all of their May trips (Figure 12). Point Lay residents harvested a bowhead whale during May; however, the hunting track is not shown in Figure 12 because the participant forgot to bring the GPS on their successful trip. The farthest documented offshore track was located approximately 20 miles offshore. Participants also harvested bearded seal and waterfowl during a few of their May trips. Map 87 depicts four May 2011 hunting tracks with associated April and May snowmachine tracks (33) to hunting areas reported by eight participants. Participants primarily targeted bowhead whale while traveling offshore during these months, so Map 87 is similar to the 2011 bowhead whale hunting track map (Map 67). Eleven percent of 2011 offshore hunting trips occurred during May (Table 38).

4.2.3.2.2 June and July

By June, participants had shifted their focus away from bowhead whales and began to target bearded seals and beluga whales (Figure 12). Participants reported successfully harvesting bearded seals and waterfowl during June. Offshore hunting activities peaked in July; participants targeted bearded seals, spotted seals, beluga whales, caribou and fish during this month and successfully harvested seals, beluga whales, and caribou. Map 88 shows 40 hunting tracks for the months of June and July recorded by nine participants during 2011. Hunting activities for this period extended from just south of Icy Cape in the north to Omalik Lagoon in the south. Most participants limited June hunting activities to within 10 miles of the community. Participants traveled farther from Point Lay in July but stayed closer to shore, traveling throughout Kasegaluk Lagoon and along the barrier islands. The farther offshore tracks in June are primarily associated with bearded seal hunting whereas the July tracks inside Kasegaluk Lagoon reflect the shift toward beluga and caribou hunting. A few July tracks were located approximately six to eight miles offshore. July had the greatest number of trips recorded for the 2011 study year at 29 trips (41 percent) followed by June with 15 trips (21 percent) (Table 38).

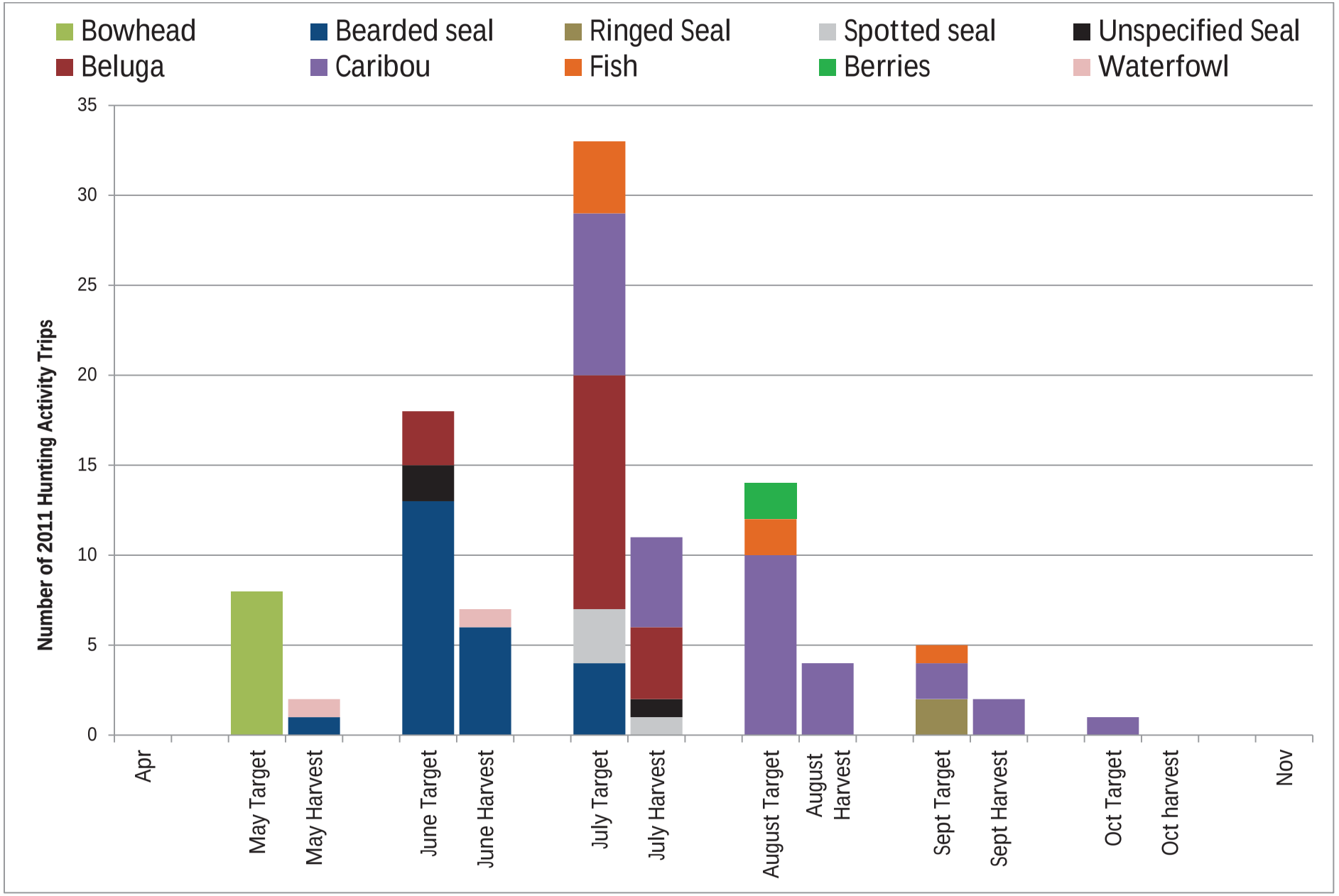
4.2.3.2.3 August and September

Boating activity slowed with the start of caribou season in August. An abundance of caribou near the community allowed some participants to search for and harvest them by boat along the coast. A few participants also searched for fish and berries during August (Figure 12). Participants continued to search for caribou and fish during September and also targeted ringed seals during a few trips. A few participants harvested caribou during September. August and September hunting tracks appear on Map 89; nearly all tracks are located within Kasegaluk Lagoon. August tracks extend along the shore and barrier islands from Icy Cape Pass in the north to Kuchiak Creek in the south. During September 2011 participants traveled primarily south of Point Lay as far as Kuchiak Creek. During August and September, participants targeted berries, caribou, ringed seal, and fish (e.g., salmon), and reported harvests of caribou and these trips accounted for approximately one-quarter of the 2011 offshore hunting trips (Table 38).

4.2.3.2.1 October

One participant reported a single caribou trip in October which appears on Map 90. This track extends from Point Lay to Akunik Pass (Eleven-Mile) within Kasegaluk Lagoon. Point Lay participants did not report any offshore harvest in October (Figure 12). Boating activity ceased after Kasegaluk Lagoon became unnavigable due to ice buildup. Point Lay participants reported 70 trips of offshore subsistence activity during 55 calendar days between May 8 and October 2, 2011.

Figure 12: Point Lay 2011 Trips by Primary Target Species and Harvest Species and Month



Map 87: April and May Hunting Tracks and Associated Snowmachine Tracks, Point Lay 2011

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

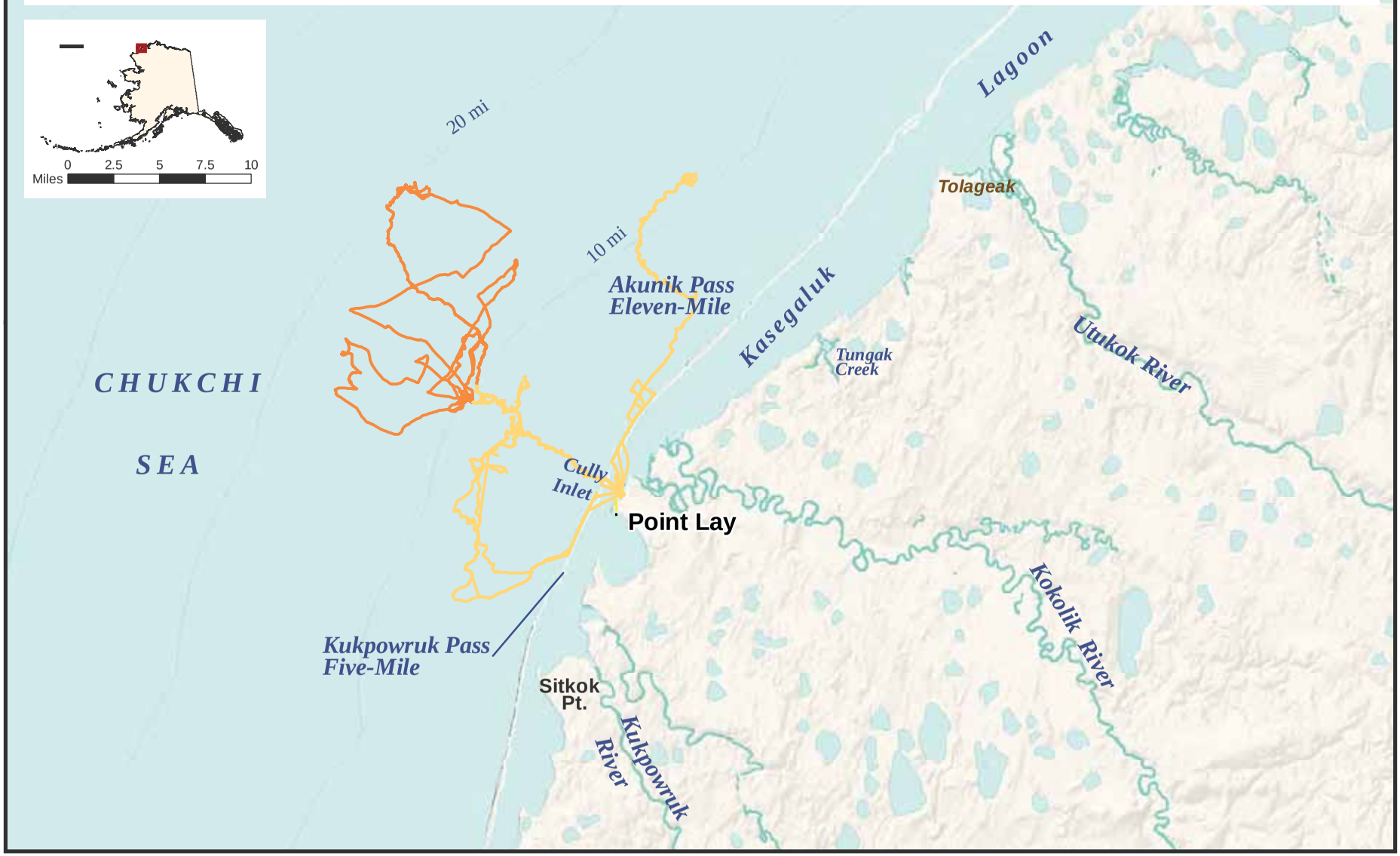
! study community

May hunting track

April-May snowmachine track

4 boat tracks representing 8 hunting trips
33 snowmachine tracks
8 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Regulation and Enforcement, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 88: June and July Hunting Tracks, Point Lay 2011

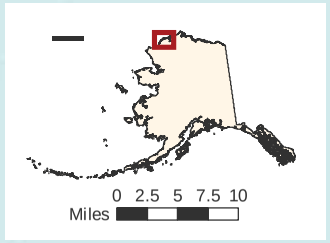
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

July hunting track
June hunting track

40 boat tracks representing 44 hunting trips
9 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



30 mi
20 mi
10 mi
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Utukok Pass
Lagoon
Avak Inlet
Avak River
Tolageak
Akunik Pass
Eleven-Mile
Kasegaluk
Tungak Creek
Utukok River
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Sitkok Pt.
Kokolik River
Naokok Pass
Kukpowruk
Omalik Lagoon
Kuchiak Creek
River
! Wainwright
Kuk River

Map 89: August and September Hunting Tracks, Point Lay 2011

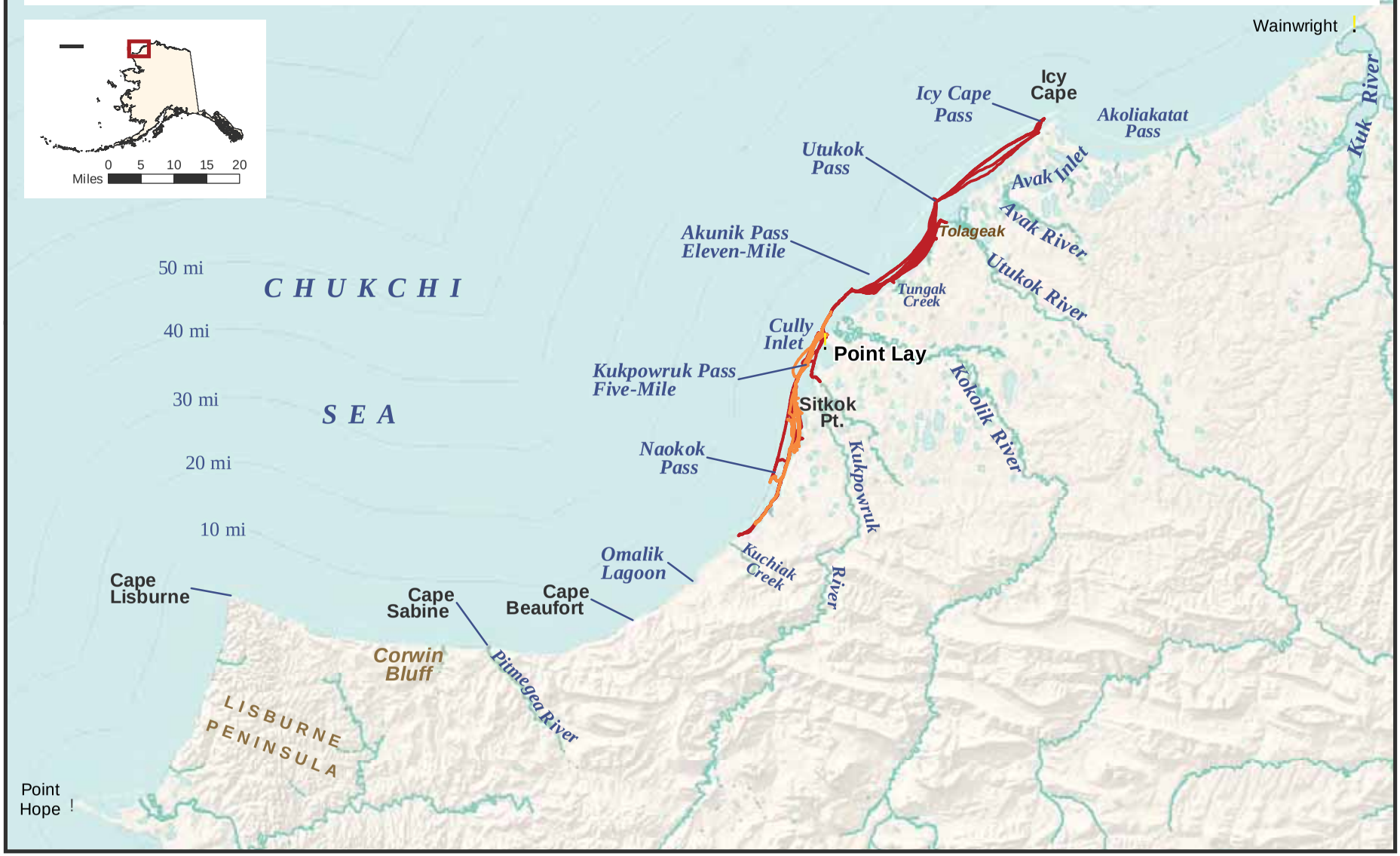
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

August hunting track
September hunting track

17 boat tracks representing 17 hunting trips
5 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 90: October Hunting Tracks, Point Lay 2011

Stephen R. Braund & Associates
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Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

October hunting track

1 boat track representing 1 hunting trip
1 respondent

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

4.2.3.3 2012

4.2.3.3.1 April and May

Point Lay began initial bowhead whaling efforts in April and reported one trip with harvests of waterfowl during this month (Figure 13). Bowhead whaling continued as the primary offshore hunting activity in May and included a successful bowhead harvest trip in addition to bearded seal and waterfowl harvests. Six participants reported 26 tracks associated with offshore spring hunting (Map 91). This map includes snowmachine trails to a lead located approximately 10 miles offshore. Hunting tracks for these two months are located northwest of the community and May tracks extend to an area over 20 miles offshore. April tracks are located up to 13 miles offshore. These two months accounted for just fewer than 10 percent of the community's entire 2012 offshore hunting activity (Table 38).

4.2.3.3.2 June and July

June hunting activity trips focused on the pursuit of bearded seal in addition to searching for beluga, caribou, and waterfowl. Although beluga and caribou were not successfully harvested in June, residents did report successful harvests of bearded seal and caribou in addition to opportunistic harvests of eggs and ringed seal (Figure 13). July shows an increased emphasis on beluga and caribou trips as well as a large number of fishing trips with few trips for seals and berries. Participants successfully harvested all three of the primary targeted resources (beluga, caribou, and fish) in July. Ten individuals provided 78 tracks representing 80 hunting trips during these two summer months; these 80 tracks represented 68 percent of Point Lay's offshore hunting activity in 2012 (Map 92; Table 38). June tracks occurred primarily to the west of the community, extending approximately 15 miles offshore. In July, tracks occurred as far south as Omalik Lagoon and north to Icy Cape with the majority of tracks located within Kasegaluk Lagoon although a few tracks extend as far as approximately six miles offshore.

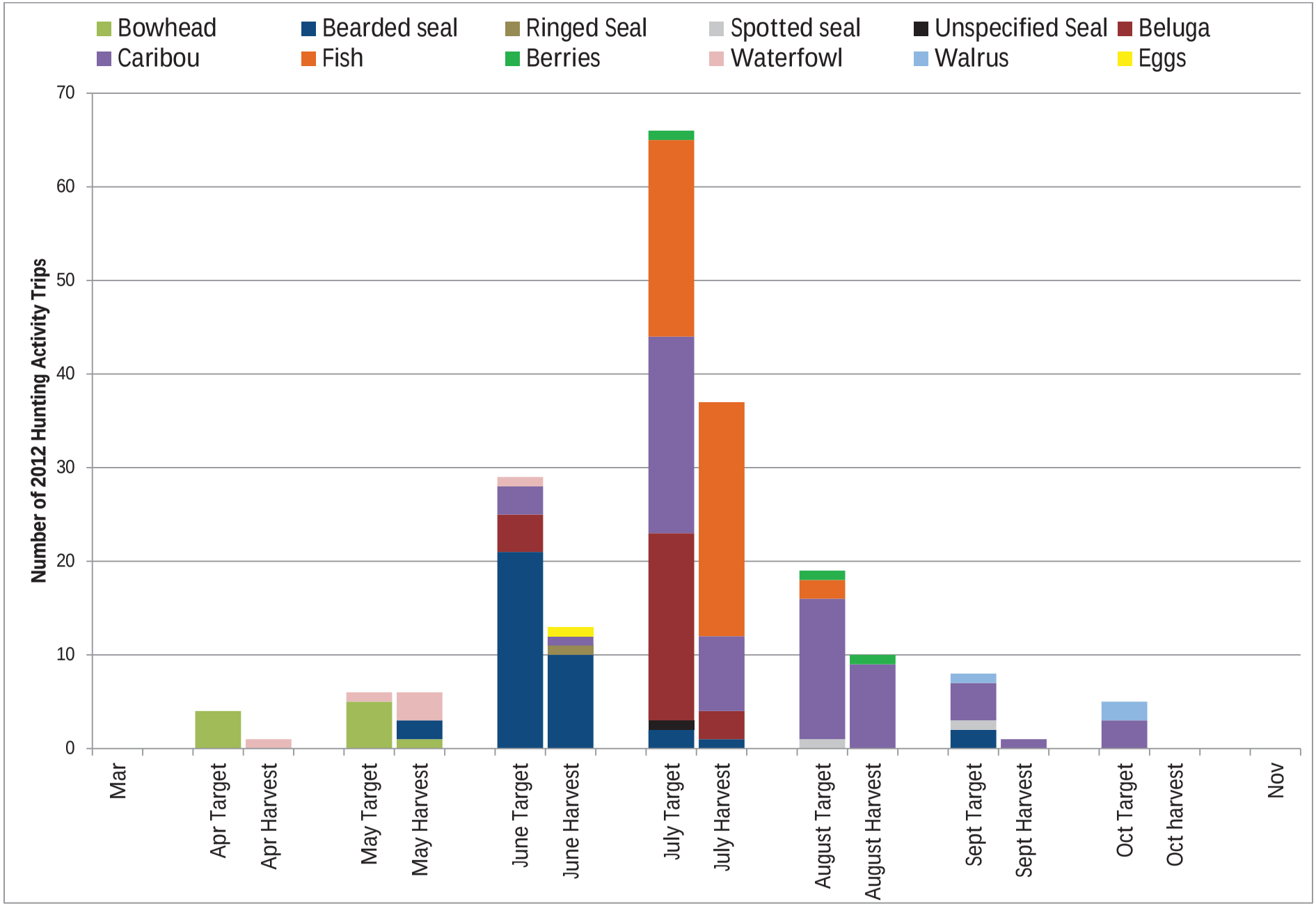
4.2.3.3.3 August and September

As in previous years, offshore hunting activity began to slow in August and decreased even further into September. Residents primarily sought caribou during these two months, although spotted and bearded seals, fish, berries, and walrus were also pursued (Figure 13). Caribou and berries were the only resources successfully harvested. Map 93 shows the 21 tracks reported during these two months by seven Point Lay participants. All tracks occurred within Kasegaluk Lagoon as far north as Tolageak and south to Kuchiak Creek. These trips accounted for 25 percent of Point Lay 2012 offshore trips (Table 38).

4.2.3.3.1 October

Two individuals reported four hunting tracks in October of 2012 in search of caribou and walrus. Neither participant reported successful harvests of either resource (Figure 13). Map 94 shows the location of these four hunting tracks within the entirety of Kasegaluk Lagoon. Counting dates of departure and separate dates of return, Point Lay participants reported 117 trips of offshore subsistence activity during 70 calendar days between April 22 and October 8, 2012.

Figure 13: Point Lay 2012 Trips by Primary Target Species and Harvest Species and Month



Map 91: April and May Hunting Tracks and Associated Snowmachine Tracks, Point Lay 2012

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(907) 276-8222 srba@alaska.net

! study community

April hunting track

snowmachine track

May hunting track

9 boat tracks representing 10 hunting trips
17 snowmachine tracks
6 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

Map 92: June and July Hunting Tracks, Point Lay 2012

Stephen R. Braund & Associates
P.O. Box 1480
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(907) 276-8222 srba@alaska.net

! study community

July hunting track
June hunting track

78 boat tracks representing 80 hunting trips
10 respondents

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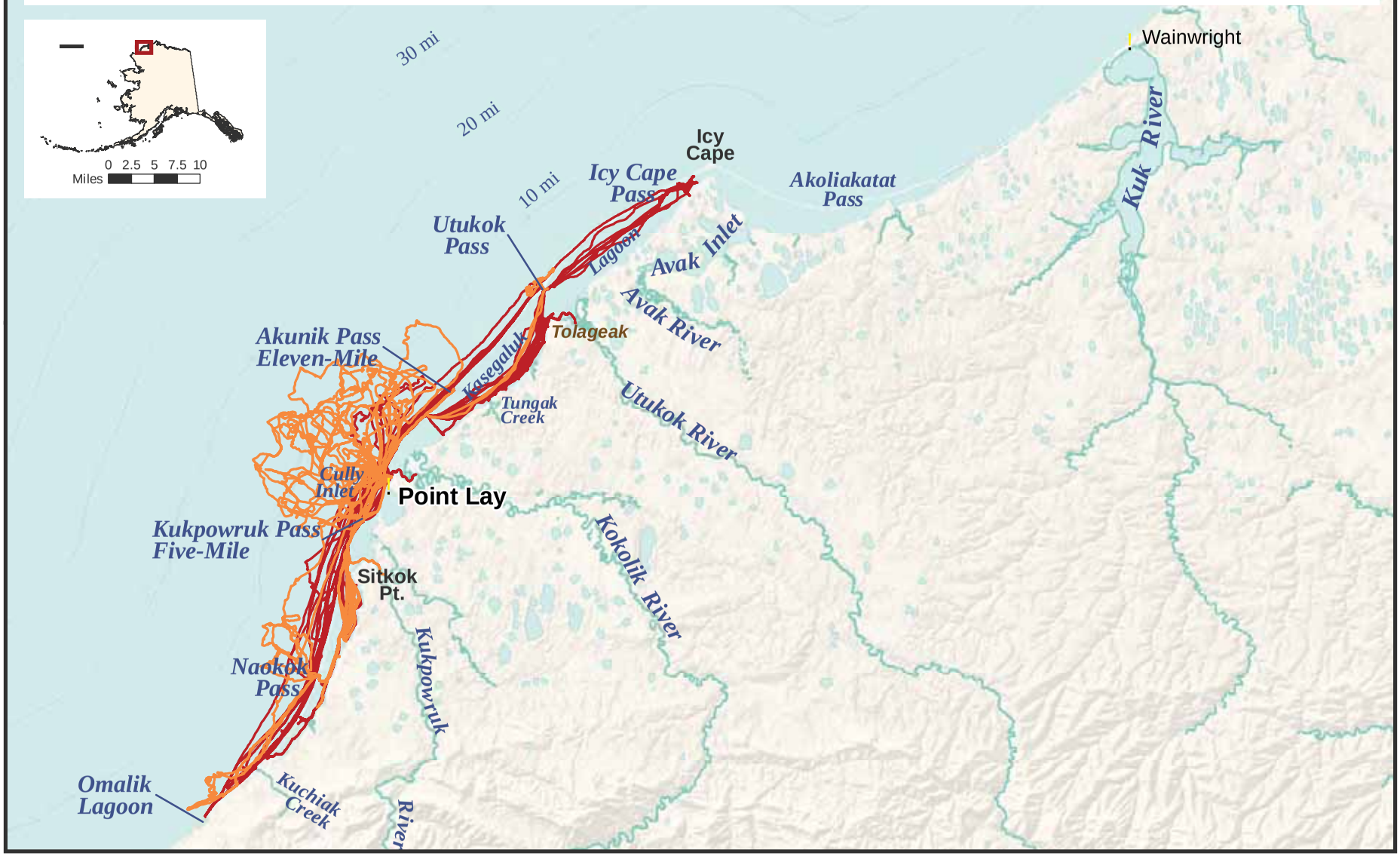


Map 93: August and September Hunting Tracks, Point Lay 2012

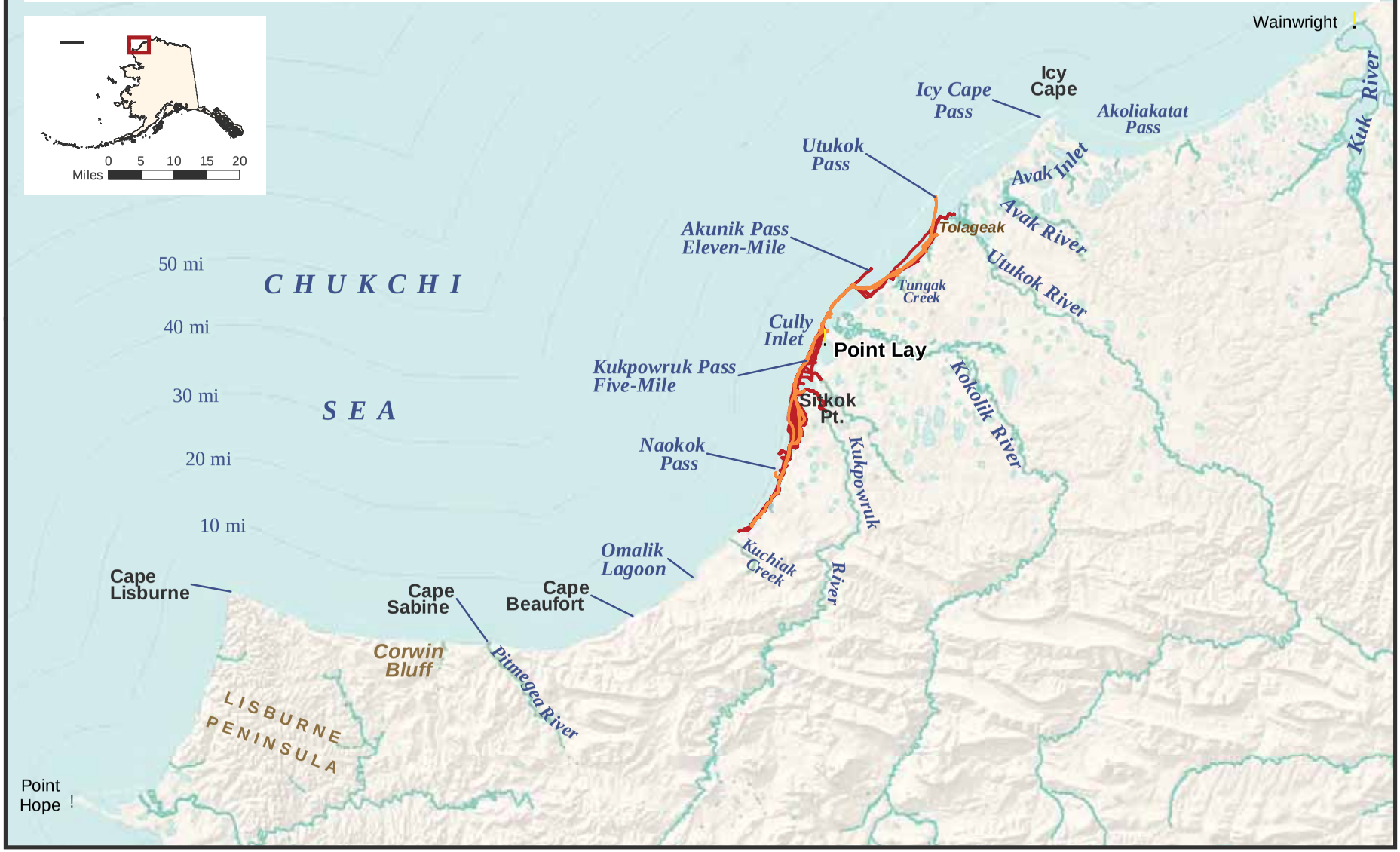
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

August hunting track
September hunting track

21 boat tracks representing 23 hunting trips
7 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 94: October Hunting Tracks, Point Lay 2012

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

October hunting track

4 boat tracks representing 4 hunting trips
2 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.

4.2.3.4 Comparison of Three Study Years

The following discussion briefly summarizes the offshore seasonal round based on the limited three years of study data. Depending on the spring break-up and the formation of leads near Point Lay, bowhead whaling activities are the focus of April and May offshore subsistence activities. In some cases, bearded seal are also sought at this time but with less intensity than in the later summer months. Offshore subsistence activities during June are focused toward sealing as well as the annual beluga hunt in either June or July. Residents continue their sealing activities into July and also begin to target caribou that come to the coast for insect relief. Fishing in the lagoon also occurs during July and into the fall. Offshore activities during the fall months of August and September are focused on caribou and berry harvests, although some sealing was also reported.

Comparing Point Lay participants' April and May tracks from 2010 through 2012 show that in all years Point Lay whaling crews hunted for bowhead in leads northwest of the community (Map 84, Map 87, and Map 91). However, in 2011 and 2012 these leads were located twice as far from the community than in 2010. April hunting did not occur in 2011. Point Lay participants did not report hunting waterfowl in 2010 as they had in 2011 and 2012.

June and July tracks for the three study years show similar distribution in that the majority of tracks occur within 10 miles offshore and between Icy Cape and Omalik Lagoon (Map 85, Map 88, and Map 92). In all years, June hunting tracks were more concentrated around the community yet farther offshore than July hunting tracks, which were more dispersed along the coast but tended to stay inside Kasegaluk Lagoon. The number of tracks reported during these two months increased by half in 2011 and doubled in 2012 compared to the previous year's tracks with only one additional participant reporting tracks in each study year. The greatest increase in the number of trips primarily occurred in July during the three study years, increasing from 19 in 2010 to 53 in 2012 (Table 38). July was the most active month for offshore activities in 2012 and 2011; June was the most active in 2010. Participants reported targeting/harvesting the same resources during June and July for all three study years with the exception of no harvesting of waterfowl in 2010 or collecting of eggs in 2011, and the addition of harvesting berries in 2012.

Comparison of tracks for the August and September time period show that in August of 2010, Point Lay participants conducted all hunting activity south of Point Lay whereas in 2011 and 2012 the hunting occurred both north and south of the community (Map 86, Map 89, and Map 93). September tracks were located in similar areas south of Point Lay (except for the one trip to Point Hope in 2010). Except for the 2010 Point Hope trip, all tracks occurred within Kasegaluk Lagoon. The frequency of trips during these months stayed relatively the same across all three years. Residents explained during the November 2013 community review meeting that offshore travel during September decreases due to the shallow water in Kasegaluk Lagoon that are caused by a decrease in rain and east winds. Caribou and berries were the only resources targeted/harvested with regularity during the fall months. Bearded seal were targeted/harvested during two of the three years. Spotted seal, walrus, ringed seal, and Dall sheep were only reported during one of the three years during these two months.

No October hunting occurred offshore in Point Lay in 2010 due to an early freeze-up in Kasegaluk Lagoon; however, in 2011 and 2012 participants were able to conduct a few October trips within the lagoon (Map 90 and Map 94). During these two years residents unsuccessfully targeted caribou and also unsuccessfully targeted walrus in 2012.

4.2.4 Duration of Hunting Activities

Table 39 provides the frequency and percentage distribution of trip duration by hunting activity trips. The distribution of trip durations was consistent across study years. Most trips were 12 hours or less in duration with 59 to 62 percent of trips lasting between four and 12 hours. Point Lay participants reported 16 to 24 percent of trips lasted between 12 to 24 hours. During the November 2013 community review meeting, Point Lay residents indicated that they can take longer trips because they can travel inside

Kasegaluk Lagoon which is protected by barrier islands and protects the lagoon from rough ocean conditions that would otherwise not be suitable for travel. Less than five percent of trips had durations lasting more than 24 hours.

Table 39: Point Lay Duration of Trips

Duration	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
Less than 4 hours	6 (14%)	9 (14%)	20 (20%)
4-8 hours	15 (34%)	24 (37%)	35 (35%)
8-12 hours	12 (27%)	14 (22%)	27 (27%)
12-24 hours	9 (21%)	16 (24%)	16 (16%)
more than 24 hours	2 (5%)	2 (3%)	3 (3%)
Total	100%	100%	100%
Number of trips	44	65	101
Chi-Square p = .108			

Stephen R. Braund & Associates, 2013.

Map 95 through Map 97 display Point Lay hunting trips by duration of trip with separate colors indicating trips four hours or less, four to eight hours, eight to 12 hours, and 12 or more hours in length. While trips of four hours or less that are located in Kasegaluk Lagoon are located closer to Point Lay than trips of longer duration, there is less correlation between trips lasting more than four hours. Similar to Wainwright, a number of trips of shorter duration are of similar extent as those of the longest duration, which indicates that duration of trip is tied more closely to the type of subsistence activity (e.g., bowhead whaling versus ringed seal hunting) rather than the distance from the community.

Table 40 provides a frequency and percentage distribution of departure and return times by trip. Most hunting activity trips (between 84 and 91 percent) began in the afternoon or evening. However, the distribution of afternoon departures compared to evening departures changed over the course of the three years with afternoon departures increasing from 40 to 57 percent and evening departures show a corresponding decrease in percent of trips (51 to 30 percent). This change is due to the increase in the number of afternoon trips rather than decrease of evening trips. Very few trips began between midnight and noon during all three study years; whereas, many of the return trips (40 to 47 percent) to the community ended during this time. Returns between 6:00 p.m. and midnight were also common (35 to 39 percent of trips). In general, the period between 6:00 a.m. and noon was the least active time.

Table 40: Point Lay Period During Day of Departure

Hunting Activity Trip Time	Departure Time			Return Time		
	2010	2011	2012	2010	2011	2012
midnight - 6:00 a.m.	0 (0%)	3 (5%)	3 (3%)	20 (47%)	27 (40%)	50 (44%)
6:00 a.m. - noon	4 (9%)	8 (12%)	10 (10%)	7 (16%)	6 (9%)	8 (7%)
noon - 6:00 p.m.	17 (40%)	32 (48%)	59 (57%)	1 (2%)	11 (16%)	12 (11%)
6:00 p.m. - midnight	22 (51%)	23 (35%)	31 (30%)	15 (35%)	24 (35%)	44 (39%)
Total	100%	100%	100%	100%	100%	100%
Number of Trips	43	66	103	43	68	114
	Chi-Square p=.241			Chi-Square p=.228		

Stephen R. Braund & Associates, 2013.

Map 95: Duration of Hunting Trip, Point Lay 2010 (April-September)

Stephen R. Braund & Associates
P.O. Box 1480
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(907) 276-8222 srba@alaska.net

! study community
! other community

trip duration:
12 hours - 36 hours
10 tracks, 5 respondents

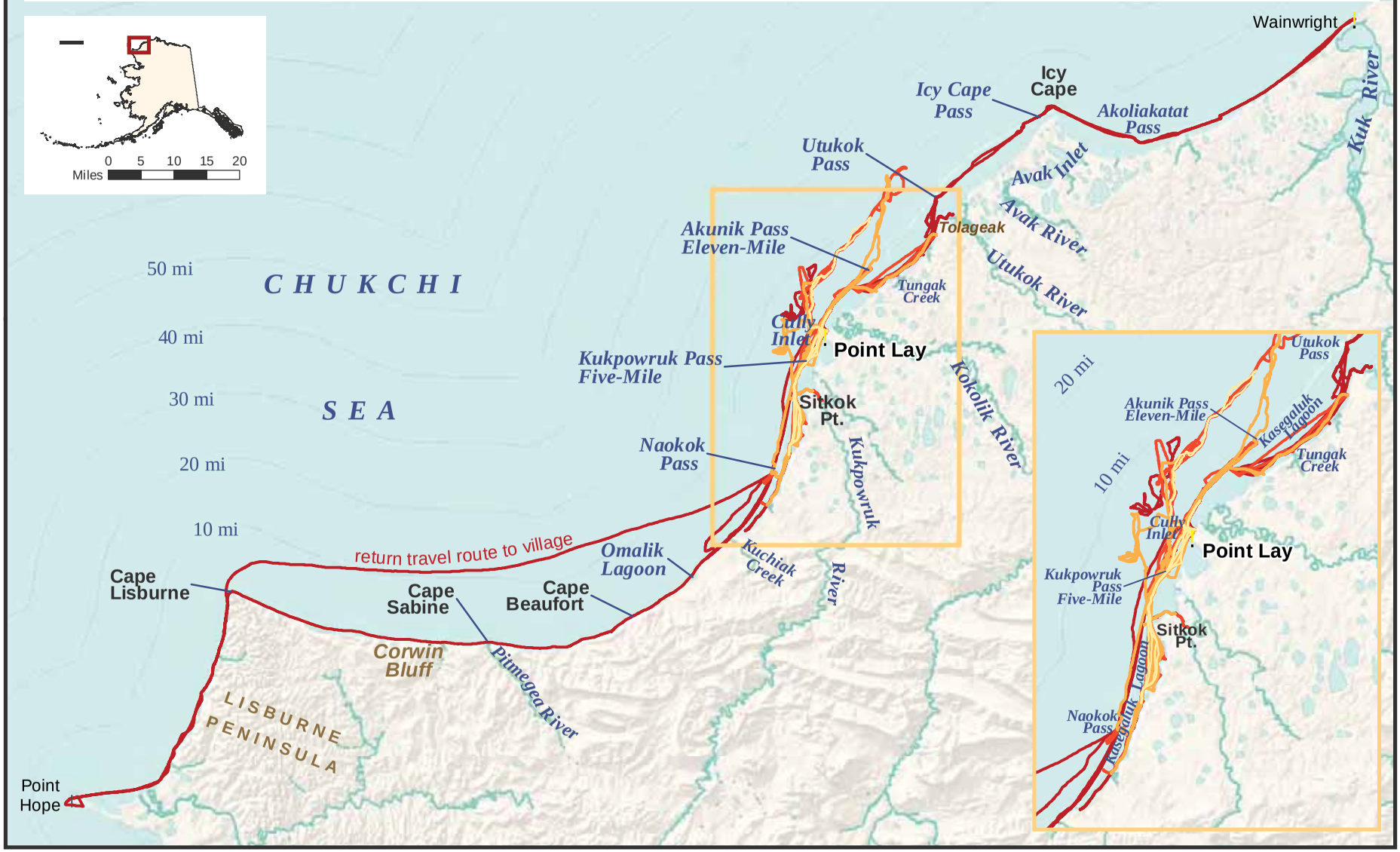
trip duration:
8 hours - 12 hours
11 tracks, 3 respondents

trip duration:
4 hours - 8 hours
14 tracks, 7 respondents

trip duration:
0 hours - 4 hours
6 tracks, 2 respondents

all durations:
41 boat tracks representing
41 hunting trips, 8 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 96: Duration of Hunting Trip, Point Lay 2011 (May-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

trip duration:
12 hours - 27 hours
13 tracks, 6 respondents

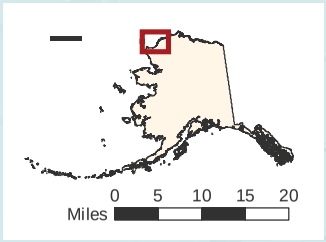
trip duration:
8 hours - 12 hours
14 tracks, 7 respondents

trip duration:
4 hours - 8 hours
23 tracks, 7 respondents

trip duration:
0 hours - 4 hours
7 tracks, 5 respondents

all durations:
57 boat tracks representing
65 hunting trips, 12 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Utukok River

Akunik Pass
Eleven-Mile

Tolageak

Tungak Creek

Cully Inlet

Point Lay

Kukpowruk Pass
Five-Mile

Sitkok Pt.

Kokolik River

Naokok Pass

Kukpowruk River

Omalik Lagoon

Kuchiak Creek

50 mi

40 mi

30 mi

20 mi

10 mi

C H U K C H I

S E A

Cape Lisburne

Cape Sabine

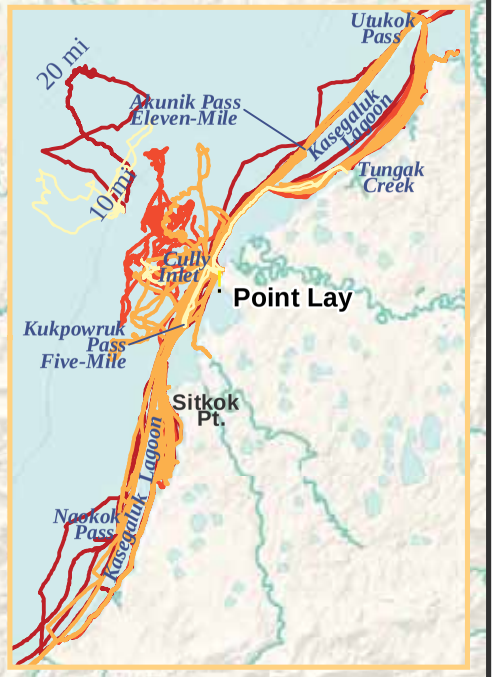
Cape Beaufort

Corwin Bluff

Pitmegea River

L I S B U R N E
P E N I N S U L A

Point Hope !



Map 97: Duration of Hunting Trip, Point Lay 2012 (April-October)

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community
! other community

trip duration:
12 hours - 29 hours
19 tracks, 8 respondents

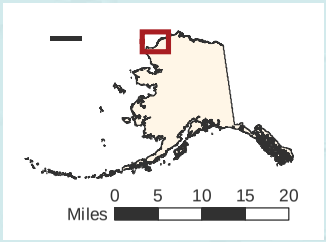
trip duration:
8 hours - 12 hours
26 tracks, 9 respondents

trip duration:
4 hours - 8 hours
33 tracks, 11 respondents

trip duration:
0 hours - 4 hours
19 tracks, 8 respondents

all durations:
97 boat tracks representing
101 hunting trips, 16 respondents

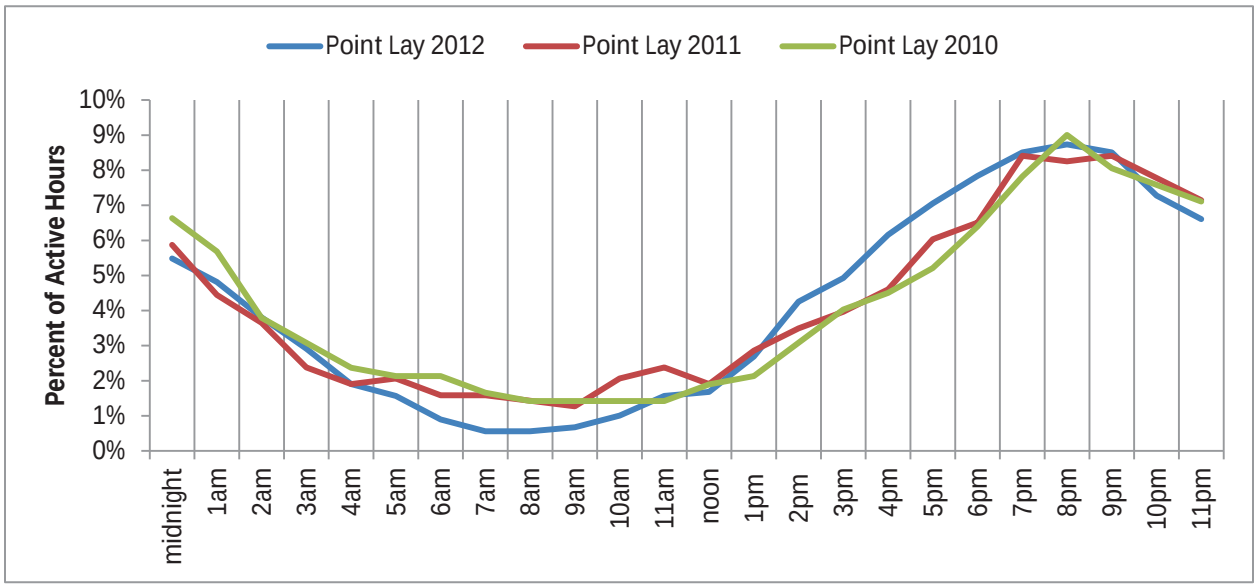
Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !
Icy Cape
Icy Cape Pass
Akoliakatat Pass
Kuk River
Utukok Pass
Avak Inlet
Avak River
Utukok River
Akunik Pass
Eleven-Mile
Tolageak
Tungak Creek
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Sitkok Pt.
Kokolik River
Naokok Pass
Kukpowruk River
Omalik Lagoon
Kuchiak Creek
50 mi
40 mi
30 mi
20 mi
10 mi
C H U K C H I
S E A
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
L I S B U R N E
P E N I N S U L A
Point Hope !
20 mi
Kasegaluk Lagoon

Figure 14 displays Point Lay participants' active offshore hunting hours by time of day. All study years show a similar distribution of activity. Point Lay participants were most active later in the day with the majority of active hunting hours (58 percent) in 2010 occurring between 6:00 p.m. and 1:00 a.m. The most active period was similar in 2011 with 58 percent of active hunting hours occurring between 5:00 p.m. and midnight. In 2012, the most active hours shifted slightly toward earlier in the day with 61 percent of active hunting hours occurring between 4:00 p.m. and 11:00 p.m. Point Lay participants were least active between the 7:00 a.m. and noon and least active in 2011 and 2012 between 6:00 a.m. and 10:00 a.m.

Figure 14: Point Lay Active Offshore Hunting Hours



4.2.5 Number and Composition of Hunting Groups

Table 41 provides a frequency and percentage distribution of the number of trip participants in a hunting party. In 2010 and 2011, no participants undertook hunting trips in which they were the sole participant, and in 2012 only two trips occurred with only one person present. Participants reported trips with two to four participants to be the most common hunting party. Trips with large numbers of participants represent instances in which a participant took his family on a boating trip, or instances in which a study participant paired up with an additional boat or boats for a hunting trip. Estimates of 20 or more trip participants reflect varying observations for the community's beluga hunt in June and July.

Table 42 provides a frequency distribution of hunting party composition by each participant's relationship to the participant for the three study years. In 2010, participants most frequently reported that one or more of their children had accompanied them on hunting trips; whereas in 2011 and 2012 participants reported other relatives (e.g., uncles, aunts, and cousins) as the most frequent trip participant. One possible explanation for this shift is that there were fewer older participants and more younger participants in 2011 and 2012, and if these younger participants had children they were likely too young to accompanying their parents on hunting trips. Spouse/significant others followed by other (e.g., friends) were the third and fourth most common trip participants. Siblings were the least common trip participant across all study years.

Table 41: Point Lay Number of Trip Participants

Number of Participants	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
1	0%	0%	2 (2%)
2	11 (22%)	10 (17%)	28 (25%)
3	18 (36%)	11 (18%)	26 (23%)
4	7 (14%)	13 (22%)	28 (25%)
5-9	4 (8%)	6 (10%)	20 (18%)
10-14	0 (0%)	2 (3%)	3 (3%)
15-19	0 (0%)	1(2%)	0 (0%)
20 or more	1 (2%)	0 (0%)	5 (4%)
Total	100%	100%	100%
Total Number of Trips	50	60	112

Stephen R. Braund & Associates, 2013.

Table 42: Point Lay Composition of Boat Crew by Relationship

Relationship to Participant	Number of Individuals 2010	Number of Individuals 2011	Number of Individuals 2012
Other Relative	30	79	107
Child	41	23	50
Spouse or Significant Other	24	34	40
Other	28	14	31
Sibling	8	3	15

Stephen R. Braund & Associates, 2013.

Table 43 and Table 44 provide a breakdown of hunting parties by male/female for the study years. Table 43 provides a frequency and percentage distribution of the number of males and females on each of the reported hunting trips. Participants did not report any trips in which there were no males present (Table 43). Nearly all hunting trips had one, two, or three males present. A few trips reported four and seven males present in the boat. There was at least one female present on 51 to 66 of boating trips (Table 44). Multiple females were present on more trips in 2010 (36 percent) than in 2011and 2012 (26 percent and 20 percent). A small percentage of hunting trips included four, five, or seven female participants.

Table 43: Point Lay Number of Males and Females in Boat Crew

Number	Males			Females		
	2010	2011	2012	2010	2011	2012
0	0 (0%)	0 (0%)	0 (0%)	24 (44%)	22 (34%)	57 (49%)
1	13 (24%)	11 (17%)	13 (11%)	12 (22%)	25 (39%)	37 (32%)
2	21 (38%)	26 (41%)	60 (51%)	11 (20%)	13 (20%)	19 (16%)
3	18 (33%)	17 (27%)	33 (28%)	5 (9%)	0 (0%)	1 (1%)
4	2 (4%)	10 (16%)	11 (9%)	2 (4%)	4 (6%)	1 (1%)
5	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (1%)
7	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)
	100%	100%	0 (0%)	100%	100%	0 (0%)
Total Number of Trips	55	64	117	55	64	117
Chi-Square Males p=.087 Chi-Square Females p=.022						

Stephen R. Braund & Associates, 2013.

Table 44: Point Lay Composition of Boat Crew

	Percent of Hunting Activity Trips		
	2010	2011	2012
Male	100%	100%	100%
Female	56%	66%	51%

Stephen R. Braund & Associates, 2013.

4.2.6 Estimated Costs per Trip

Table 45 and Figure 15 provides a frequency and percentage distribution of total cost per participant for hunting activity trips. In general, these trips are relatively of short duration focused on day or overnight trips during periods when weather and ice conditions are conducive to boat travel. Costs are related to direct trip expenses and do not include capital costs. While the price of individual trips varied from $0.00to over $1,000.00, 77 to 89 percent cost less than $200.00. Trips with the highest costs often reported large fuel purchases as well as other costs of oil or replacement costs for boat propellers.

Table 46 provides average (mean) trip cost for hunting activity trips. The average total cost of a hunting activity trip in 2010 was $158.00, with $92.00 spent on gasoline, $8.00 on ammunition, $41.00 on food, and $20.00 on other costs. For 2011, the average cost of a hunting activity trip was $136.00, with $72.00 spent on gasoline, $13.00 spent on ammunition, $30.00 on food and $21.00 on other costs. Costs in 2012 decreased to $104.00 per trip and corresponding decreases in all the cost categories except for ammunition. The decline in average cost per trip between 2010 and 2012 could be due to the improved hunting conditions and higher abundance of wildlife close to the village in 2011 and 2012 as compared to 2010. Several residents during the November 2013 community review meeting also indicated that 2010 had high other costs due to motor problems.

Table 47 provides a frequency and percentage distribution of hunting activity trips by cost range for both study years. Participants reported spending less than $100.00 on fuel for most trips. As noted above for Wainwright trips, in the case of no fuel costs, the participant either traveled with another person or had already purchased fuel during a previous trip.

Table 45: Point Lay Total Cost by Trip

Total Cost	Hunting Activity Trips 2010	Hunting Activity Trips 2011	Hunting Activity Trips 2012
No cost	2 (4%)	1 (2%)	14 (12%)
$1-99	17 (33%)	28 (47%)	56 (49%)
$100-199	21 (40%)	22 (37%)	32 (28%)
$200-299	7 (13%)	5 (8%)	9 (8%)
$300-399	1 (2%)	2 (3%)	1 (1%)
$400-499	0 (0%)	1 (2%)	0 (0%)
$500-999	4 (8%)	0 (0%)	0 (0%)
$1,000 or more	0 (0%)	1 (2%)	2 (2%)
Total	100%	100%	100%
Number of Trips	52	60	114
Chi-Square p=.001			

Stephen R. Braund & Associates, 2013.

Figure 15: Point Lay Total Cost by Trip

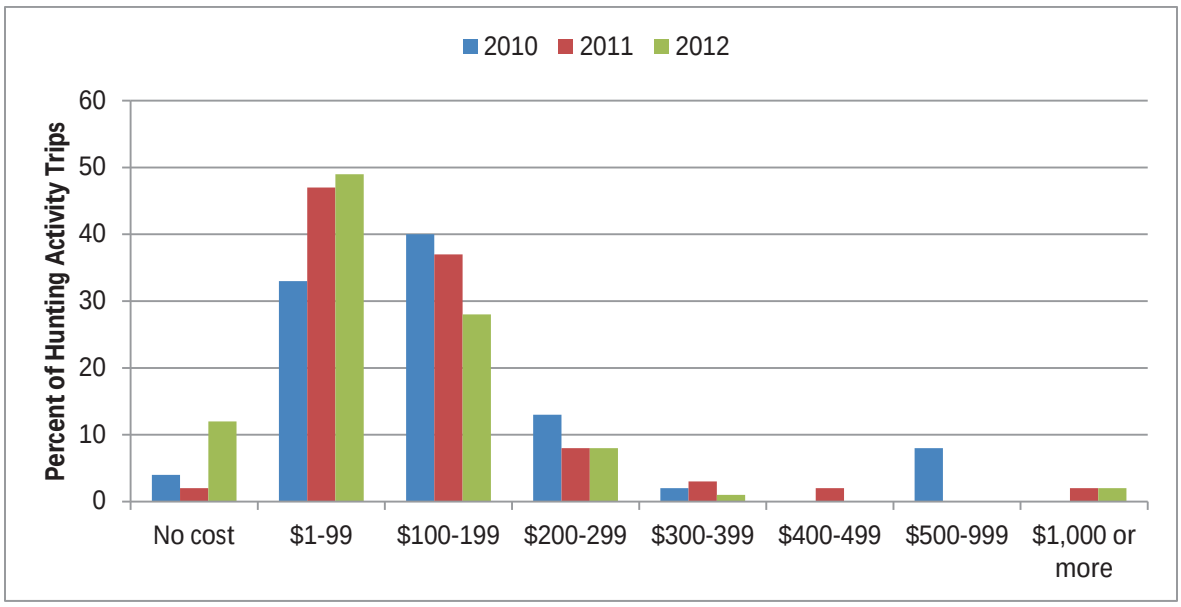


Table 46: Point Lay Average Trip Costs

Year	Gasoline	Ammunition	Food	Other Costs	Total Costs
2010	$92	$8	$41	$20	$158
2011	$72	$13	$30	$21	$136
2012	$48	$22	$24	$11	$104

Stephen R. Braund & Associates, 2013.

Table 47: Point Lay Hunting Activity Costs by Item

Costs	Percent of Hunting Activity Trips											
	Fuel			Ammunition			Food			Other Costs		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
No cost	3 (6%)	3 (5%)	19 (17%)	41 (78%)	42 (70%)	73 (66%)	16 (31%)	24 (40%)	64 (59%)	43 (82%)	55 (92%)	100 (89%)
Under $25	6 (12%)	6 (10%)	23 (20%)	1 (2%)	7 (12%)	11 (10%)	3 (6%)	7 (12%)	6 (6%)	3 (6%)	0%	4 (4%)
$25-49	5 (10%)	14 (23%)	20 (18%)	8 (16%)	7 (12%)	17 (15%)	17 (33%)	10 (17%)	13 (12%)	1 (2%)	2 (3%)	6 (5%)
$50-74	13 (25%)	12 (20%)	25 (22%)	1 (2%)	3 (5%)	7 (6%)	9 (17%)	14 (23%)	12 (11%)	0 (0%)	0 (0%)	0 (0%)
$75-99	9 (17%)	12 (20%)	7 (6%)	1 (2%)	0 (0%)	1 (1%)	0 (0%)	1 (2%)	7 (6%)	1 (2%)	1 (2%)	0 (0%)
$100-$199	13 (25%)	11 (18%)	19 (17%)	0 (0%)	0 (0%)	1 (1%)	6 (12%)	4 (7%)	6 (6%)	2 (4%)	1 (2%)	1 (1%)
$200-299	1 (2%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)
$300-399	1 (2%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (4%)	0 (0%)	0 (0%)
$400-499	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
$500-999	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)
$1,000 or more	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (2%)	0 (0%)
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Number of Trips	52	60	113	52	60	111	52	60	109	52	60	112
	Chi-Square p=.015			Chi-Square p=.61			Chi-Square p=.004			Chi-Square p=.067		

Stephen R. Braund & Associates, 2013.

SRB&A also distributed half a drum of fuel (27.5 gallons) to participants as a fuel honoraria that could have been used during offshore trips. The other half drum of fuel was distributed at the end of the field season. In the majority of cases, participants reported that they already had whatever ammunition they needed prior to departing on a hunting trip. This is reflected by the fact that participants had no costs on ammunition during 66 to 78 percent of hunting trips. An additional 12 to 16 percent of hunting trips cost participants between $25.00 and $49.00 in ammunition. Participants reported spending less than $50.00 on food for more than two-thirds of hunting trips. The field researcher also asked participants if they purchased any other supplies prior to embarking on a hunting trip. Participants most commonly reported buying either cigarettes, oil for their boats, or parts to repair their boats. Participants reported other expenses for nine to 18 percent of trips. As noted in the preceding paragraphs, the participants did not account for items that were not purchased for a specific trip (i.e., ammunition and food in hand) and thus these items were assigned a cost of $0.00. This is another reason why the reported costs per trip are lower than the actual costs.

4.3 Hunting Conditions

4.3.1 Weather, Ice Conditions, and Sea States

Table 48 provides the frequency and percentage of hunting activity trips by reported weather conditions for the three Point Lay study years. Participants reported fair weather during a majority of their boating trips. In 2010, participants reported clear conditions from a high of 46 percent of trips in 2011 to a low of 34 percent of trips in 2012. Partly cloudy conditions ranged from 31 to 38 percent of trips; overcast conditions increased in each study year from 15 percent in 2010 to 29 percent in 2012. Fog and precipitation characterized 15 percent of trips in 2010 and increased to 22 percent in 2011 and 2012.

Table 48: Point Lay Reported Weather Conditions on Hunting Trips

Reported Weather Conditions	Percent of Hunting Activity Trips			
	2010	2011	2012	Chi-Square p=
Clear	23 (43%)	28 (46%)	39 (34%)	.232
Partly Cloudy	20 (37%)	19 (31%)	44 (38%)	.658
Overcast	8 (15%)	15 (25%)	34 (29%)	.125
Foggy	2 (4%)	7 (11%)	7 (6%)	.226
Precipitation	6 (11%)	7 (11%)	19 (16%)	.535
Number of Trips	54	61	116	

Stephen R. Braund & Associates, 2013.

Table 49 provides a frequency and percentage distribution for reported ice conditions during hunting trips (see Section 2.6.2 for study definitions of ice conditions). Map 98 through Map 100 show the extent of hunting trips during three different ocean ice conditions: open ice, open water, and ice free. In 2010, participants reported ice free conditions for 67 percent of boating trips and open water for only eight percent of trips (Table 49). In 2011, open water conditions were present for 21 percent of trips in 2011, an increase of 13 percent from the previous year. The increase in the number of trips reflects participants' observations that sea ice (i.e., open water) was present on the ocean for a much longer period in 2011 than in 2010. Sea ice was also present for a longer period in 2012 than in 2010 or 2011 as evidenced by the 27 percent of open water trips. While hunters commonly target seals and walrus during open water conditions (i.e., on floating ice), participants indicated that 2010 was a somewhat abnormal year for ice conditions. Shorefast ice was present longer than usual, resulting in a later boating season. Furthermore, when the shorefast ice finally disappeared, the floating ice also went out and never came back. Thus, only a small number of 2010 hunting trips were reported to occur during open water conditions.

Map 98: Hunting Trips During Open Ice, Open Water and Ice Free Conditions, Point Lay 2010

Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

! study community

! other community

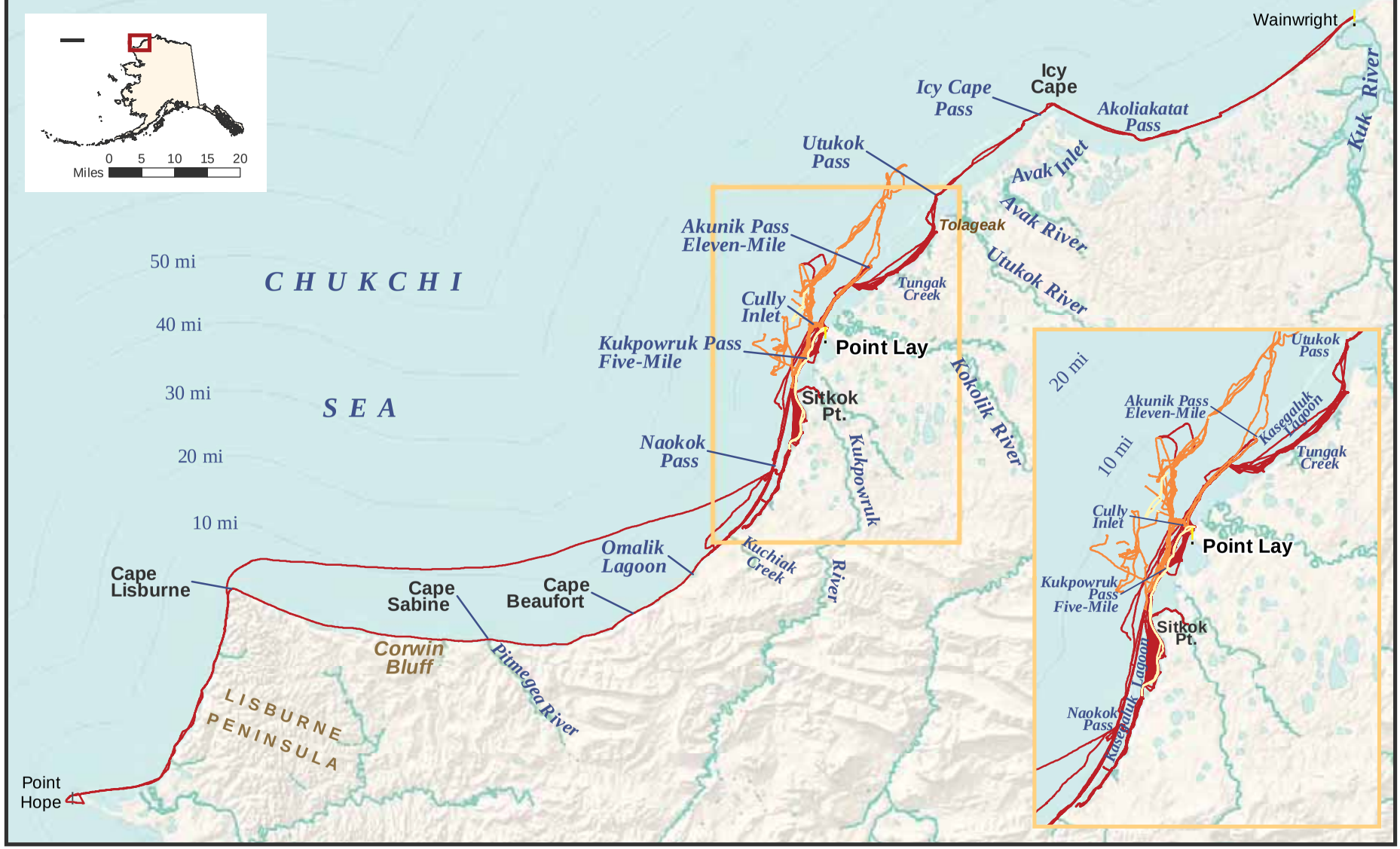
— open ice (many leads and floes not in contact) March-July —

— open water (no shorefast ice and some floating ice) May-July —

— ice free conditions, July, September-October —

47 boat tracks representing 48 hunting trips, 8 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 99: Hunting Trips During Open Ice, Open Water and Ice Free Conditions, Point Lay 2011

Stephen R. Braund & Associates
P.O. Box 1480
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! study community

! other community

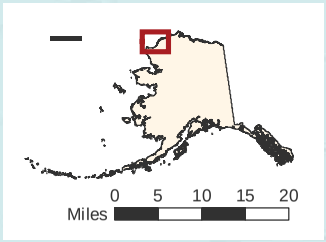
— open ice (many leads and floes not in contact) May-July —

— open water (no shorefast ice and some floating ice) June-July, September-October —

— ice free conditions, June-September —

53 boat tracks representing 61 hunting trips, 13 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Utukok River

Tolageak

Akunik Pass
Eleven-Mile

Tungak Creek

Cully Inlet

Point Lay

Kukpowruk Pass
Five-Mile

Kokolik River

Sitkok Pt.

Kukpowruk River

Naokok Pass

Omalik Lagoon

Kuchiak Creek

50 mi

40 mi

30 mi

20 mi

10 mi

C H U K C H I

S E A

Cape Lisburne

Cape Sabine

Cape Beaufort

Corwin Bluff

Pitmegea River

L I S B U R N E
P E N I N S U L A

Point Hope !

Map 100: Hunting Trips During Open Ice, Open Water and Ice Free Conditions, Point Lay 2012

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(907) 276-8222 srba@alaska.net

! study community

! other community

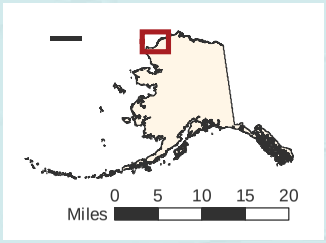
— open ice (many leads and floes not in contact) March-July —

open water (no shorefast ice and some floating ice) May-July

— ice free conditions, July, September-October —

110 boat tracks representing 115 hunting trips, 12 respondents

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Wainwright !

Icy Cape

Icy Cape Pass

Akoliakatat Pass

Kuk River

Utukok Pass

Avak Inlet

Avak River

Utukok River

Akunik Pass Eleven-Mile

Tolageak

Tungak Creek

Cully Inlet

Kukpowruk Pass Five-Mile

Point Lay

Kokolik River

Sitkok Pt.

Naokok Pass

Kukpowruk River

Omalik Lagoon

Kuchiak Creek

River

50 mi

40 mi

30 mi

20 mi

10 mi

C H U K C H I

S E A

Cape Lisburne

Cape Sabine

Cape Beaufort

Corwin Bluff

Pitmegea River

L I S B U R N E P E N I N S U L A

Point Hope !

Table 49: Point Lay Reported Ice Conditions on Hunting Trips

Reported Ice Conditions	Percent of Hunting Activity Trips		
	2010	2011	2012
Ice free	36 (67%)	36 (59%)	57 (50%)
Open water	4 (8%)	13 (21%)	31 (27%)
Open ice	14 (25%)	12 (20%)	27 (23%)
Total	100%	100%	100%
Number of Trips	54	61	115
Chi-Square p=.065			

Stephen R. Braund & Associates, 2013.

In 2011, participants reported an early thaw after the Kokolik River melted and flooded the part of Kasegaluk Lagoon directly in front of Point Lay. Sea ice remained close to Point Lay for a longer period of time in 2011 than in 2010; this is reflected in the greater number of trips participants made when ice was present (41 percent in 2011 compared to 33 percent in 2010). The presence of sea ice assists hunters by blocking waves and providing a safe place free of sand and rocks on which to butcher animals. Sea ice also provides critical habitat for seals and walruses. When sea ice is present close to the community, seals and walruses will be close to the community because they haul out on the ice. The sea ice melted away from Point Lay in July and did not return until after Kasegaluk Lagoon froze up in the fall. As in 2010, participants made the majority of their subsistence trips during ice free conditions in 2011.

In 2012, participants reported an even greater increase in the number of trips with ice present (50 percent) compared to previous years and a corresponding decrease in percent of offshore trips during ice free conditions. Over the three study years, GPS tracks indicate that participants traveled farther offshore from Point Lay during open ice and open water conditions than during ice free (Map 98, Map 99, and Map 100). Ice free conditions allow hunters to travel great distances from Point Lay, although hunting activities during this time are often focused along the coast. Similar to Wainwright, floating ice provides important habitat for bearded seals and walruses, making it easier for hunters to harvest them; it can also constitute a boating hazard that can impede travel, particularly when there is a lot of ice present in the ocean.

Table 50 provides a frequency and percentage distribution for hunter reported wind speeds during hunting trips. Participants generally preferred hunting when the wind conditions were calm or light. High north and east winds may drive water out of Kasegaluk Lagoon, making it too shallow for boating, or may generate dangerous currents at the inlets. Average wind speeds at or above 15 miles per hour were less favorable for boating and were reported for eight to 16 percent of trips over the three study years.

Table 51 provides a frequency and percentage distribution of reported wind directions for hunting trips. Participants reported calm conditions (i.e., no wind) during 23 to 33 percent of boating trips. According to participants the prevailing wind at Point Lay is generally from the north or northeast, and participants reported hunting more frequently during these wind conditions. East winds are also common (observed for approximately 10 percent of trips). Northwest winds were much more common during boating trips in 2011 and south winds were more common in 2012. All other wind directions occurred during less than 10 percent of trips.

Table 50: Point Lay Reported Average Wind Speed on Hunting Trips

Wind Speed	Percent of Hunting Activity Trips		
	2010	2011	2012
Calm	14 (26%)	14 (23%)	34 (30%)
Less than 10mph	14 (26%)	24 (39%)	43 (38%)
10-14mph	17 (31%)	18 (30%)	22 (19%)
15-19mph	4 (7%)	2 (3%)	9 (8%)
20 or more mph	5 (9%)	3 (5%)	5 (4%)
Total	100%	100%	100%
Number of Trips	54	61	113
Chi-Square p=.491			

Stephen R. Braund & Associates, 2013.

Table 51: Point Lay Reported Wind Direction on Hunting Trips

Wind Direction	Percent of Hunting Activity Trips		
	2010	2011	2012
Calm	15 (28%)	14 (23%)	33 (33%)
Variable	0 (0%)	1 (2%)	0 (0%)
North	13 (24%)	13 (21%)	18 (18%)
North Northeast	0 (0%)	6 (10%)	4 (4%)
Northeast	9 (16%)	4 (7%)	10 (10%)
East	5 (10%)	5 (8%)	10 (10%)
Southeast	0 (0%)	0 (0%)	2 (2%)
South	3 (6%)	4 (7%)	13 (13%)
South Southwest	0 (0%)	1 (2%)	0 (0%)
Southwest	3 (6%)	2 (3%)	3 (3%)
West	3 (6%)	2 (3%)	6 (6%)
North Northwest	0 (0%)	1 (2%)	0 (0%)
Northwest	2 (4%)	8 (13%)	2 (2%)
Total	100%	100%	100%
Number of Trips	54	61	101
Chi-Square p=.115			

Stephen R. Braund & Associates, 2013.

Table 52 provides a frequency and percentage distribution of the reported water condition during each hunting trip. Participants preferred to go boating under calm water conditions during the study years. Participants reported calm (i.e., swells less than two feet) conditions during 59 to 68 percent of trips. Choppy conditions occurred from 37 to 48 percent of trips. Rough conditions were the least reported across study years, with a slight increase in rough conditions in each year.

Table 52: Point Lay Reported Condition of Water on Hunting Trips

Water Condition	Percent of Hunting Activity Trips			
	2010	2011	2012	Chi-Square
Calm	32 (59%)	37 (61%)	79 (68%)	p=.486
Choppy	26 (48%)	25 (41%)	43 (37%)	p=.368
Rough	1 (2%)	4 (7%)	11 (9%)	p=.193
Total	100%	100%	100%	
Number of Trips	54	61	117	

Stephen R. Braund & Associates, 2013.

Table 53 provides a frequency and percentage distribution of answers to the question, "Did the weather influence your trip?" In 2010, participants reported that weather influenced them during their trip in some way in 52 percent of cases. In 2011, participants reported that weather influenced their trip in some way in 49 percent of cases. In 2012, participants reported the highest percentage of trips (62 percent) in which weather influenced the hunt.

Table 53: Did Weather Influence Hunting Trip

Weather Influence Hunt?	Percent of Hunting Activity Trips		
	2010	2011	2012
No	26 (48%)	31 (51%)	73 (38%)
Yes	28 (52%)	30 (49%)	44 (62%)
Total	100%	100%	100%
Number of Trips	54	61	117
Chi-Square p = .138			

Stephen R. Braund & Associates, 2013.

Similar to Wainwright, the wind and accompanying waves were the most commonly reported weather influence in the study years. Participants provided several examples in which wind influenced their trips citing high wind and waves making it too dangerous to travel out in the ocean. Describing the effect of strong winds and waves, two participants said,

> *Yeah we wanted to herd the belugas but because of how choppy it was on the ocean side we weren't able to. We sat around there for four hours to see if the weather would get clear, and then the wind shifted [to a] north, northeast wind. The edge of the ocean was almost calm but about 100 yards offshore it was choppy.* (Point Lay Hunter Observation 2012)

> *The waves were too big to access our ocean because we had to follow a channel to get out there. No I didn't try, but I thought I would be able to make it out there. When I did reach there I noticed the waves were too big to even try. When we get west wind, even 10 mph it will bring in big swells.* (Point Lay Hunter Observation 2011)

Several individuals described the wind direction as being a major factor in their decision to continue hunting or return home:

> *Yeah the wind shifted and we had to come back. The wind shifted and the ice was closing in. We had to come back.* (Point Lay Hunter Observation 2012)

> *We had a west wind that blocked the inlet so I had to go out through Five Mile [pass].* (Point Lay Hunter Observation 2012)

Ice conditions were identified as another weather influence on trips. Participants described shifting ice as the main reason for cutting a hunting activity short. As one person explained,

> *It was the ice conditions. We couldn't go far enough because of the ice and I think the wind changed that day and it started blowing southeast. I told them I didn't want to get stuck in the ice. Not with my kid.* (Point Lay Hunter Observation 2012)

Others discussed the difficulties encountered while hunting in slushy ice conditions and the danger that such conditions can create for the hunters. Two participants said,

> *When we went out on the water from the edge of the ice it cooled off really quick. There was a little bit of slush in the water. There wasn't very much. On our way back the slush had really thickened up. I felt very leery [about the ice]. I had never been out on water like that.* (Point Lay Hunter Observation 2012)

> *It was mainly the ice conditions that influenced the hunt. Couldn't stay out there long because of the ice. Hard on the motor.* (Point Lay Hunter Observation 2010)

Equally discussed were observations regarding the effects of precipitation and visibility on hunting trips. Heavy rains, dense fog, and dark night conditions influenced Point Lay participants' 2010, 2011, and 2012 hunts. Examples of participant observations regarding each of these conditions are as follows:

> *We wanted to go to the end of the lagoon, but it was just too much rain coming.* (Point Lay Hunter Observation 2012)

> *It wasn't foggy where we were but we could see the fog coming in. We ended our trip early and came back to the boat launch.* (Point Lay Hunter Observation 2011)

> *I can't remember why -- if it was a lot of walruses in the water. It was getting dark on us I think.* (Point Lay Hunter Observation 2010)

Shallow lagoon waters were also reported as influencing the hunt because participants could not access the ocean. When water in the lagoon rises, residents often cite it as a positive weather influence as it allows them to engage in offshore hunting. Participants discussed the ways in which water levels in the lagoon influence their hunt as follows:

> *Calm and shallow. I wanted to go farther but that was as far as I could go. Too shallow in the lagoon.* (Point Lay Hunter Observation 2012)

> *We waited on the lagoon to get deep so our boats could travel and we could bring the belugas into it.* (Point Lay Hunter Observation 2011)

> *Yeah our water in the lagoon did come up to my boat so I was able to put it in the water and go out for a ride.* (Point Lay Hunter Observation 2011)

A few individuals also reported cold conditions as influencing the hunt.

4.3.2 Trip Safety and Access

Table 54 provides a frequency and percentage distribution of answers to six safety and access questions. Point Lay participants reported that they had difficulty accessing their intended hunting area in 15 to 26 percent of trips. Reported challenges included rough ocean conditions, poor visibility, shallow water in Kasegaluk Lagoon, fresh ice on the water, and safety concerns. Participants described these challenges in the following ways:

> *Just the first part of the trip when it was kind of rough when it was raining a bit. You can see where we turned around when we were first started going out into the inlet. That's where we turned around and decided to wait out the water. We didn't want to leave anybody behind so we hung out with them. The other boats were a little too small.* (Point Lay Hunter Observation 2011)
>
> *It was shallow in the lagoon. We saw a caribou at Utukok but because it was shallow we couldn't go.* (Point Lay Hunter Observation 2012)
>
> *Just couldn't see the channel really because the water was silty.* (Point Lay Hunter Observation 2012)
>
> *We were going to spend the night but the wind changed on us. That weather wasn't supposed to hit for a couple days. That's when the lagoon finally formed up with ice.* (Point Lay Hunter Observation 2012)
>
> *I wanted to go to the ocean. It was not safe enough to go out.* (Point Lay Hunter Observation 2010)

Table 54: Point Lay Percentage of Trips with Safety/Access Issues

	Percent of Hunting Activity Trips			
Safety/Access Issues	2010	2011	2012	Chi-Square p=
Did you have any difficulty accessing the hunting area?	11 (20%)	16 (26%)	17 (15%)	p=.160
Did anything make your hunting trip less safe?	16 (30%)	12 (20%)	17 (15%)	p=.067
Were there any accidents or mishaps on your trip?	2 (4%)	4 (7%)	8 (7%)	p=.712
Did you travel farther than usual?	5 (9%)	6 (10%)	16 (14%)	p=.618
Did your hunting trip cost more than usual?	4 (7%)	4 (7%)	18 (15%)	p=.125
Did any meat spoil?	0 (0%)	3 (5%)	2 (2%)	p=.173
Number of Trips	54	61	117	

Stephen R. Braund & Associates, 2013.

Point Lay participants reported a similar percentage of trips over the three years (15 to 30 percent) in which some aspect of their trip made it less safe. Related to the conditions that made it difficult to access their hunting areas, participants reported a similar set of conditions that made trips less safe including strong wind, limited visibility, and ice conditions. Additional factors that made trips less safe included mechanical breakdowns and wildlife encounters. The most common of the examples included outboard motors not functioning and walrus herds posing a danger to the hunters:

> *My outboard. It didn't want to stop, had to use the kill switch to stop.* (Point Lay Hunter Observation 2010)

> *The shoulder gun was clogging up with powder residue. The recoil was getting pretty bad. Our cleaning rod stopped working.* (Point Lay Hunter Observation 2012)

> *Yes, the whales. We got slapped by its flukes and it could have flipped the boat if it really wanted to. We actually threw the harpoon at a whale before [community member] got his. The whale saw what we were doing. The whale did a vicious right turn and a right spin at the same time and slapped the left side of the boat. The harpoon didn't enter the whale and the bomb did not detonate. The whale was not affected at all. During the harvest the wind picked up and the ice started cracking under the whale. That was kind of dangerous.* (Point Lay Hunter Observation 2011)

> *Well the fact that we approached the walruses cautiously. There's always the fear of bears. Other than that, no.* (Point Lay Hunter Observation 2011)

Participants reported an accident or a mishap in four percent of trips in 2010 and seven percent of trips in 2011 and 2012. In 2010, one participant reported that several boats broke down at the beginning of the beluga hunt, and one participant reported accidentally steering his boat too close to a herd of walruses. In 2011, two participants reported an instance in which a bowhead whale struck a boat with its fluke, one participant reported that his boat broke down during a trip, and one participant reported that his scope mount broke during a trip. In 2012, participants reported broken motor props and engine compartment, rifle equipment damage, hitting submerged objects, and personal injuries. Examples provided by participants regarding the above mishaps and accidents are as follows:

> *We hit metal under the water and it brought the boat to a dead stop. [She] was in the bow and it sent her to the back. She hurt her wrist.* (Point Lay Hunter Observation 2012)

> *We broke down by the old village. We overheated the motor. We just broke down. My starter, it wouldn't start at all. We had to open the motor, take the top part of it off and use the rope to pull start it.* (Point Lay Hunter Observation 2011)

> *When I tried to harpoon the seal my knee popped and I just about went overboard. Still recovering from a blanket toss injury.* (Point Lay Hunter Observation 2012)

Traveling farther than usual was reported in nine to 14 percent of trips; provided explanations included having to travel farther than anticipated for subsistence resources, hazardous boating conditions, disruption from helicopter and airplane activity in 2010 and 2012, and taking a special trip to Wainwright. In most instances, participants reported traveling farther in search of belugas or caribou but often did not provide a reason for why the resources were not located in their usual place. In two instances, participants attributed the greater distance traveled to aircraft activity. They said,

> *Every year we have to go look for them [beluga] now. They used to come in here by themselves [but farther now due to aircraft traffic].* (Point Lay Hunter Observation 2010)

> *When the summer first started we had trouble with caribou because of the helicopters.* (Point Lay Hunter Observation 2012)

Participants reported spending more money than usual on a hunting trip in seven percent of cases in the first two study years; this number doubled to 15 percent of trips in 2012. The most common explanation for an expensive hunting trip was the high cost of fuel. Associated with the high cost of fuel were the factors of having to travel farther, towing whales, or using more gas in order to navigate rough boating conditions. Participants provided the following examples:

> *I think we used a couple of extra gallons because of how big the waves were.* (Point Lay Hunter Observation 2011)
>
> *The gas for towing, but that's probably usual if you're towing.* (Point Lay Hunter Observation 2012)
>
> *Length of [the trip]. Overnight [means] more grub, more gas.* (Point Lay Hunter Observation 2012)

A number of participants also reported the cost of new outboard motors as the reason for increased costs.

No participants reported meat spoilage associated with a hunting trip in 2010. In 2011 and 2012, participants reported five and two percent of trips respectively in which a portion of harvested meat spoiled. In all but one case, Point Lay participants identified portions of the bowhead whale harvest as spoiling.

4.3.3 Weather and Whaling

As part of ongoing data collection for the project, the study design established weather stations and collected weather data from secondary sources in Point Lay. The study team used the weather station data to allow correlation with hunting events. The following figures compare wind speed during spring whaling periods in Point Lay. The study team defined a whaling event as the continuous blocks of time that were recorded among participants whaling crews' GPSs while engaged in whaling activities.

Figure 16 through Figure 18 graph wind speed across Point Lay's 2010, 2011, and 2012 spring whaling seasons. Orange squares indicate the average wind speed during whaling events. Except for one instance in April of 2012, participants preferred to go whaling during periods of relative calm when winds were 10 miles per hour or less. As shown in Figure 18, weather data was unavailable for the two earliest whaling events in April of 2012.

4.4 End of 2010 Season Reviews

In December 2010, the field researcher conducted four end-of-season reviews in Point Lay of the 11 active 2010 participants. During the first 2011 field trip in March, end-of-season review questions were also asked of participants who were not available in December 2010. The purpose of the end-of-season reviews was to provide an opportunity for study participants to compare the 2010 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences The end-of-season reviews were also used to determine if any study participants had taken any offshore trips that were not accounted for, noticed any unusual weather or wildlife related observations, to solicit suggestions for subsequent years of the project, and to confirm whether or not they would be willing to participate during the 2011 study year.

Figure 16: 2010 Point Lay Spring Whaling

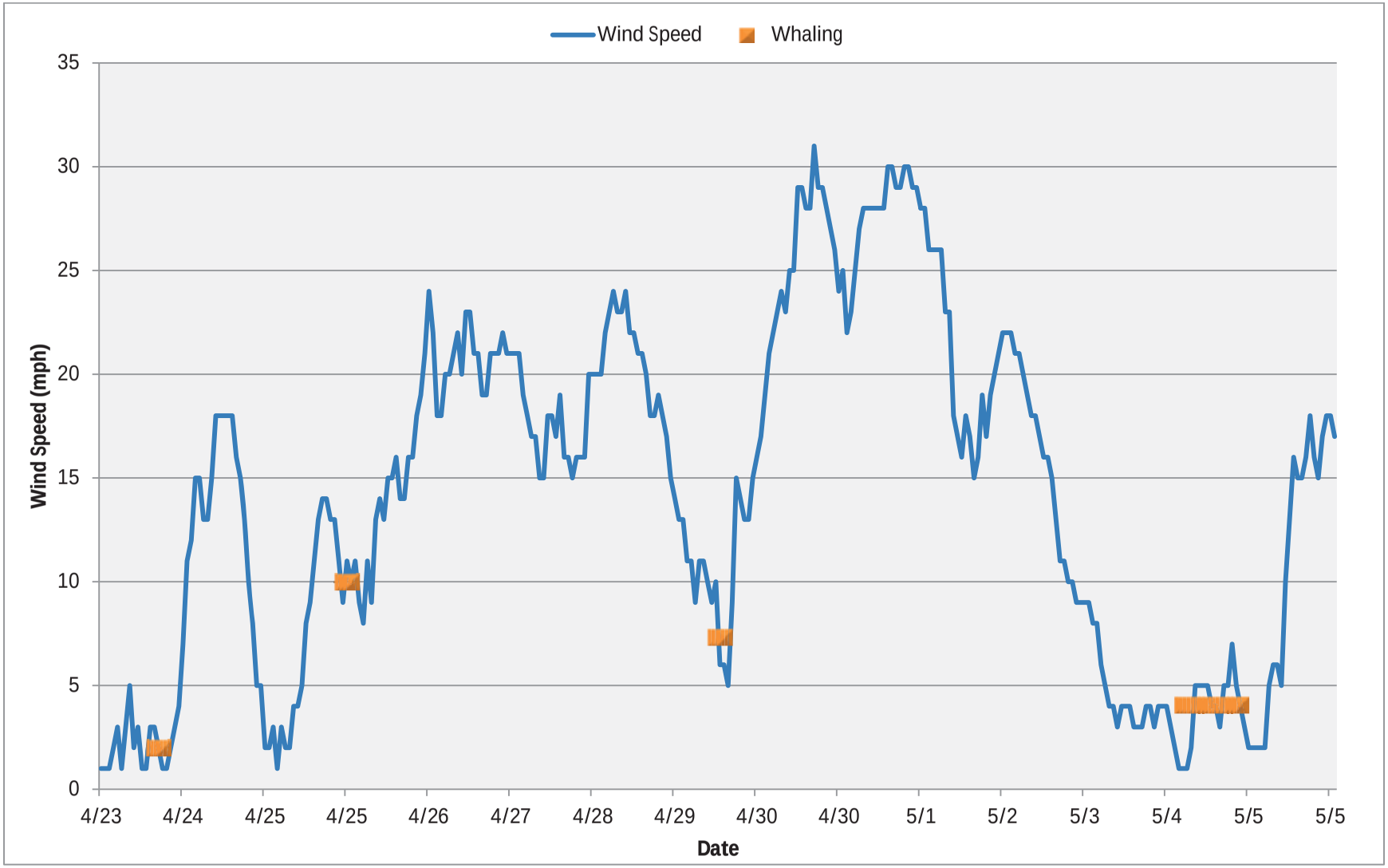


Figure 17: 2011 Point Lay Spring Whaling

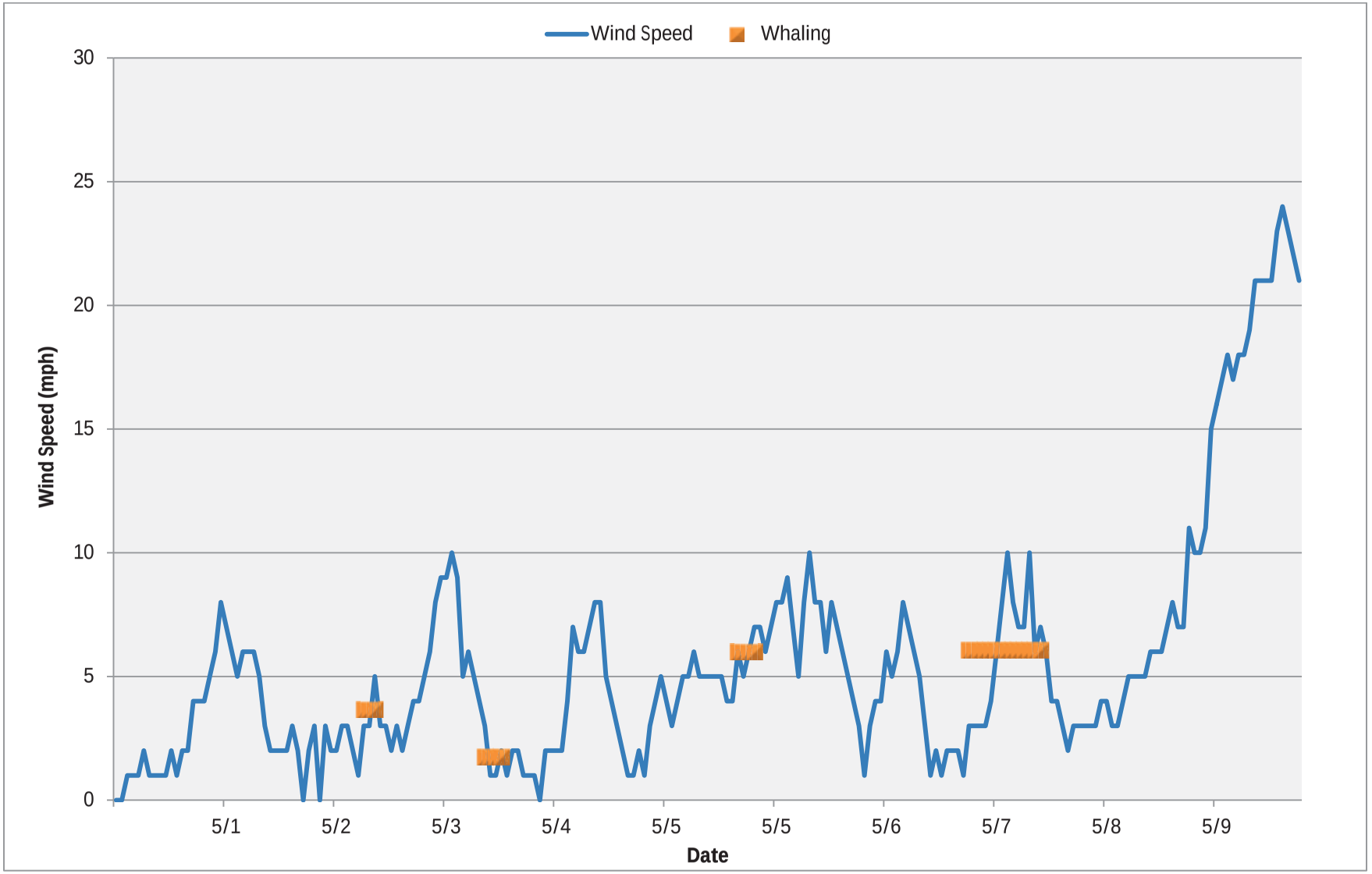
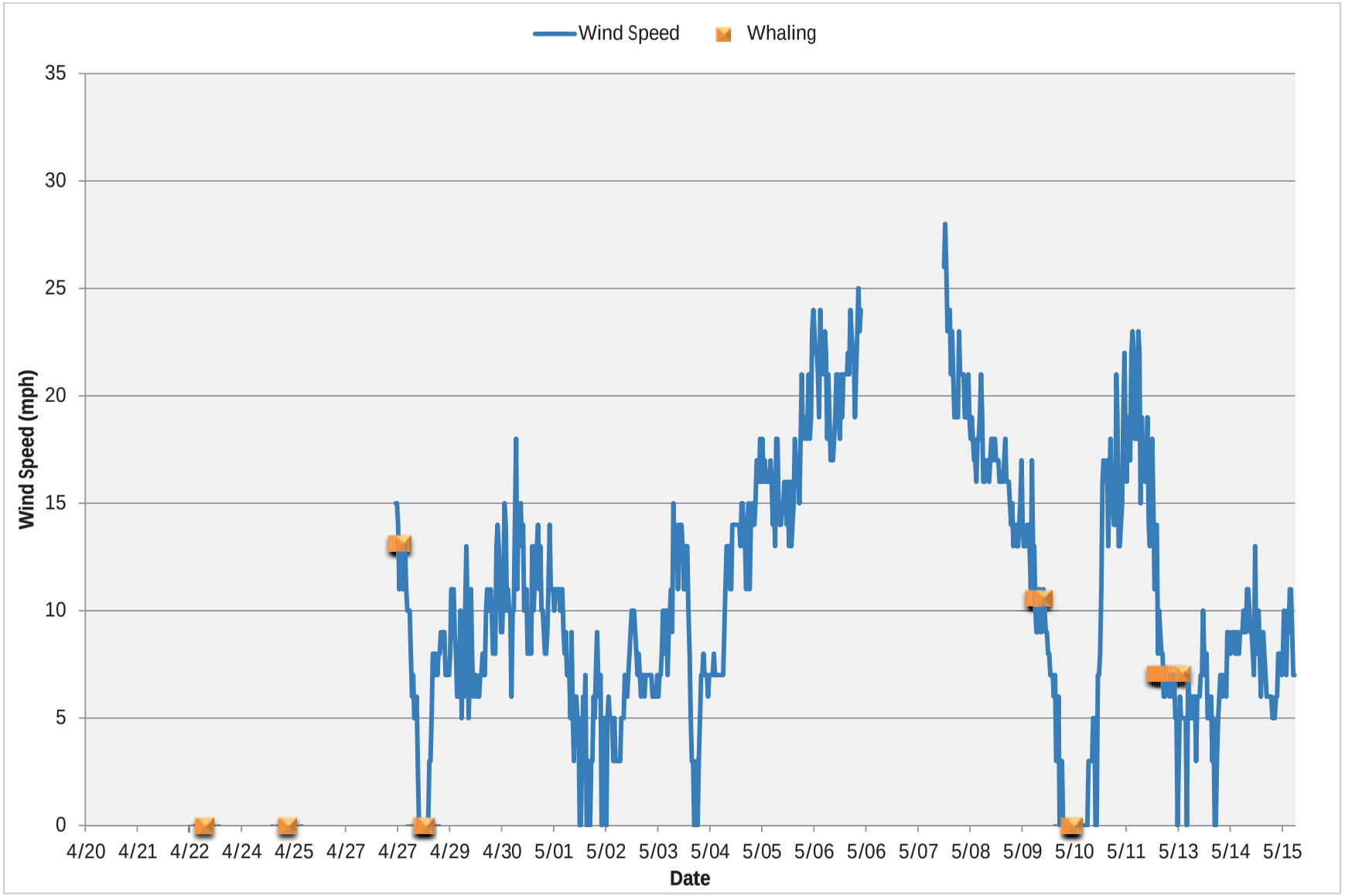


Figure 18: 2012 Point Lay Spring Whaling



4.4.1 Review 2010 Trips and GPS Tracks with Participants

Prior to the December 2010 field trip, the study team tabulated the total number of trips for each Point Lay participant and combined each participant's GPS tracks into a single file. Once in the field, the field researcher reviewed with each participant how many offshore trips had been recorded for that hunter for 2010 and showed each participant his or her combined GPS track map for the season. Each participant was asked to comment on the accuracy of the offshore trip count and the GPS map.

In most cases, participants indicated that the number of trips recorded was correct and that their map looked accurate. Several less active participants in Point Lay reported that they had forgotten to take their GPS out during the beluga hunt in June, and one participant said that he had forgotten to bring his GPS on a number of four-wheeler trips early in the season. In some cases, particularly when a trip had occurred at the beginning of the 2010 boating season, the participant was unable to remember sufficient details from the trip. While the four Point Lay participants indicated the number of recorded trips for each individual was correct, these tracks are not representative of the entire community's total amount of offshore subsistence effort. During a 2012 community review meeting of Point Lay's 2010 and 2011 hunting tracks, participants indicated that up to one-third of tracks completed by Point Lay residents were not accounted for because participants either forgot their GPS or forgot to turn it on.

4.4.2 2010 Boating Season Compared to Previous Seasons

Point Lay participants were asked to compare the 2010 boating season to previous boating seasons. While some participants reported 2010 was a fairly typical year, others noted a continued trend of change related to changing weather and reduced harvest amounts. Participants reported that the 2010 season was marked by higher winds than normal and a lack of sea ice. Several reported diminished harvests in bearded seal, walrus, and coastal caribou because of these changes. Describing the poor seal harvests in 2010, one participant said,

> *It wasn't that good of a season as far as* ugruks *and seals but it was a good season. Seasons change from year to year and plus we have to wait for the lagoon ice to go out.* (Point Lay Hunter Observation March 2011)

4.4.2.1 Hunting Activities

Harvest Amounts Compared to Past Years. Participants compared harvest amounts for the 2010 boating season to previous years. Most participants said that 2010 was comparable to other recent years, but added that the overall long term trend is toward less ice and diminished harvests. One participant summarized the 2010 boating season as follows:

> *It was a typical year. I'm working more than I'm hunting. [Community member] and I went out hunting; we were seeing seals up the rivers. We saw a number of land critters – caribou for us [were] too far to get. Brown bears [were] scaring the caribou. Gillnetting was good; [we had] salmon in the lagoon and in the rivers. I saw what I thought was a wounded loon. We tried to check it out closer but it kept flapping its one wing and it got away from us. Of course the* ugruks*, they go with the ice so it was kind of a poor season for us [because the ice went out so fast]. The beluga season was average. It's [decreased harvests] not the fact that there were less belugas, it was our tactics.* (Point Lay Hunter Observation December 2010)

Another participant, when asked how 2010 compared to other years, replied that 2010 was the worst year in terms of harvest amounts he had ever experienced. He said,

> *I harvested less this year than any other year. It's just getting worse and worse. Just not seeing them as much as I used to.* (Point Lay Hunter Observation December 2010)

Lack of sea ice, where bearded seals are known to haul out, has diminished the numbers of these animals that are easily accessible to Point Lay hunters in recent years. When ocean currents or the wind carries ice away from the coast, the bearded seals follow the ice into deeper waters. One participant remarked that the previous five to seven years have been poor harvest years for bearded seals:

> *I know one thing for sure: all of us are not catching as much bearded seal as we used to, [in the last] five to seven years. Lots of us boat captains [owners] used to take home lots of bearded seals, now we're lucky if we get one bearded seal. There sure are a lot of seals though, but we're not big on eating spotted seals.* (Point Lay Hunter Observation December 2010)

Another participant added that high levels of sediment in the rivers keep bearded seals away. Commenting on the 2010 boating season, this participant said that sediment in the river persisted for a longer period than usual and the sea ice went out early. The result was a shortened window for harvesting bearded seals. This participant described,

> *I know the* ugruk *season was kind of slow because the river water was kind of murky and as soon as it cleared up, they started showing up. I just got one. I think I was the only one that harvested one in June, and then the ice went out all of a sudden. It is every year [that the water is murky] and you don't see them until it clears up. You only have like a two week window for hunting* ugruks *and seals.* (Point Lay Hunter Observation March 2011)

Although a record number of walruses hauled out near Point Lay in September, Point Lay participants did not harvest them. Participants prefer to harvest and butcher walruses on ice because sand and gravel get into the meat when they are harvested on shore. One participant commented that he had not harvested walruses in years because he had not seen them on the ice. This participant said, "No walruses. Haven't seen any walrus on ice in years" (Point Lay Hunter Observation March 2011).

Several participants reported poor coastal caribou harvests in recent years due to a recent decrease in caribou numbers. Two participants commented,

> *I haven't caught any caribou. I haven't even taken home 10 caribou these past two years.* (Point Lay Hunter Observation December 2010)

> *Hardly any [coastal caribou]. My son harvested some in July, right here at the point and then down here at the river. They came in from the south, like 5,000 of them.* (Point Lay Hunter Observation March 2011)

4.4.2.2 Hunting Conditions

4.4.2.2.1 Weather Conditions Compared to Past Years

During the end-of-season reviews, two participants indicated that persistent high winds throughout the boating season pushed water out of Kasegaluk Lagoon and made it too shallow for boating. One participant said that the wind interfered with whaling activities:

> *Too much windy stormy because [two whaling crews] tried to go down [south], but they never did. They tried to go back down, [but it was] too windy, too rough, ice breaking, so they go up [north].* (Point Lay Hunter Observation December 2010)

Another participant said that the wind hampered his ability to go boating for an entire month:

> *We got our wind, our east wind came early and water from our lagoon got pushed out; it got so shallow that we couldn't even go hunting for a whole month this year. So there's got to be a time frame on my GPS where it wasn't used. That's not normal.* (Point Lay Hunter Observation December 2010)

One participant added that persistent high winds and shallow water in the lagoon are recent phenomena, but did not offer an explanation for the changes. This participant said: "This year was too windy and too shallow. A long time ago it never used to be this way" (Point Lay Hunter Observation December 2010).

4.4.2.2.2 Water and Ice Conditions

In addition to the lack of sea ice reported by hunters, several participants reported that break-up is occurring earlier and freeze-up later than in years past. During end-of-season reviews that the field researcher conducted in December 2010, one participant said that there was no shorefast ice at a time when the ocean should have been frozen. This participant said,

> *That's not normal. Matter of fact, our ocean should have been frozen [by now]. We don't have any shorefast ice frozen yet; it never froze to our shore yet. It should have been ice in the air now, too, which there isn't. Our climate is changed. We should have been shiver kind of freeze from one building to the other.* (Point Lay Hunter Observation December 2010)

The same participant returned to the topic of shorefast ice. He added that ice should have frozen to the shore in November:

> *It used to freeze earlier to the shore. It's not even frozen to the shore. We're already into December; it should have been frozen in November.* (Point Lay Hunter Observation December 2010)

4.4.2.2.3 Safety and Access

Participants who reported experiencing safety or access problems cited either shallow conditions in Kasegaluk Lagoon or a lack of sea ice as causes. Lack of ice has precluded residents from walking on sea ice and made bearded seal harvests more difficult. One resident summed up his experiences in this way:

> *The ice is more rotten. We hardly walk on it now. Seems like everybody is scoping the ice out because there's been a couple of years we shot a bearded seal and it was surrounded by rotten ice and we couldn't get it. Last year it seems like we'd be more cautious about taking the animals because of the rotten conditions. We always try to make some noise and shoo them into the water so that they'll come up and get a breath of fresh air by the boat.* (Point Lay Hunter Observation December 2010)

Participants agreed that shallow water in Kasegaluk Lagoon is a common experience that occurs every year. When the study team asked participants to comment on how frequently shallow conditions in the lagoon occur in any given year, one participant said, "It happens a lot [that the lagoon is low]. It's happened in the past that the northeast wind takes all the water out*"* (Point Lay Hunter Observation March 2011). Participants' comments suggest that shallow conditions affected some hunters more than others. One participant indicated that his boat is too big for when the lagoon gets shallow and affects his trips because he can't get out of the lagoon. For others familiar with using a GPS to navigate in the lagoon, shallow water had a smaller impact on safety and access during the season. One participant said,

> *[Community member] always goes. He knows how to operate the GPS. When we go into the lagoon we are okay, the channel is shallow. He and his wife know where to go because they know how to use the GPS.* (Point Lay Hunter Observation December 2010)

4.4.3 Subsistence Resource Observations

Participants were asked to comment on the health, behavior, abundance, and distribution of animals they observed offshore in the vicinity of Point Lay. In nearly all cases, participants reported a decrease in the abundance of marine mammals during the 2010 boating season; in some cases participants indicated this

was a change in local abundance due to changes in distribution but were not clear if there was a greater change in population levels. The one exception to this trend was a major increase in the walrus population near the community in the fall.

Two participants reported a decrease in the local abundance of bearded seals near Point Lay. One participant attributed this decline to a decline in sea ice near the shore. This participant said,

> *Hardly any [bearded seals]. It seems like if we're not catching them, something's happening. I used to see lots of bearded seals on the ice but this year, like I said, I saw a pod of 100 seals on the ice but this year I didn't see that number. I saw like half of that number, maybe 30 when it should have been 100. I almost want to say this is my theory, because of our climate changing and the ice getting rotten farther, the seals have more of a chance of swimming away from the areas. When they have good ice these animals can't swim away. They have to stay in the area and keep that ice open. They have the freedom to go anywhere now. There's more rotten ice.* (Point Lay Hunter Observation December 2010)

Several individuals commented on the unusual distribution and behavior of seals in the area because of the lack of ice. One individual said,

> *Fewer than normal. Ice blew out. Only landlocked ice. Usually find them in the free floating ice.* (Point Lay Hunter Observation)

One participant said that bearded seals are still present close to shore, but added that they have only been young seals, saying, "We hardly get bearded seals. We never get any bearded seals, only young ones here and there" (Point Lay Hunter Observation December 2010).

In September of 2010, thousands of walruses hauled out on the barrier islands across Kasegaluk Lagoon near Point Lay. One participant reported that as many as 20,000 walruses hauled out on one of the islands near the old village site. The unprecedented numbers prompted the field researcher to ask participants if they had an explanation. One participant shared his observations as follows:

> *Well, I don't know if 'unusual' is the correct term anymore, but the new norm is having walruses up and down our beaches. I photographed up to 20,000. Ground zero was right around the old Point Lay site because the ice is so far away now and their feeding ground is between the currents off Point Lay. That's anywhere from 15 to 20 miles west of Point Lay, and that's where they're feeding. I think they're just working the beach and using that as a place to leave their pups when they're going out and foraging because they can't leave them on the ice anymore. They make the 20 mile trip [back and forth in a day]. They're all huddled together in a large group. We went one step farther this year, and we protected them from harassment. We worked with FAA and Search and Rescue. We had aircraft diverted; we kept boats [and] the media away from them. We kept harassment away from [the area]. There were very few stampedes and very few deaths opposed to last year. There were over 100 [deaths] in 2009.* (Point Lay Hunter Observation December 2010)

Other participants added that they thought the walruses were hauling out on the beach because of a lack of ice in the ocean. One said, "Not enough ice for [the marine mammals] so they had to come to the shore for their resting grounds" (Point Lay Hunter Observation December 2010). Another participant added,

> *I was working at the [communication] center at night [from] 6:00 p.m. to 6:00 a.m., and I could hear them from down there and up here making lots of noise. They were down at the old village site. No [not normal]. No ice, I think. They used to be on top of the ice. Nowadays they've got no ice.* (Point Lay Hunter Observation December 2010)

In addition to observations about marine mammals, one participant noted a decline in the abundance of caribou near the village but did not provide a reason as to the cause. Participants also noted fewer than normal common and king eider ducks.

Participants made several observations regarding unusual distribution of several species including a bowhead near the community in June, moose near the coast due to inland wildfires near Fairbanks, and murres and cormorants located farther north. According to participants, warming conditions are also bringing species more commonly associated with other regions into the Point Lay area. Participants reported seeing porpoises, narwhals, and even a puffin. Two participants described their observations in the following way:

> *We saw a puffin in Point Lay last year. We saw porpoises and narwhals last year. We think that's from the [development] activity. And there's something going on with our climate. Little bit of everything.* (Point Lay Hunter Observation December 2010)

> *We saw porpoises. We were on the beach in the old village with a big old campfire and about 200 porpoises went by. They swam right through the swimming walruses and there was no interaction. It was unusual to see that many.* (Point Lay Hunter Observation December 2010)

Observations of unhealthy resources include several sick caribou seen along the coast, skinny beluga, and a wounded loon. Regarding the skinny beluga one person indicated the cause may be related to lack of food in usual areas and said,

> *When we were cutting them up, they were kind of skinny. The used to be chubby a long time ago! Like from here to here. Maybe they don't stay up, can't find the food where they usually eat...* (Point Lay Hunter Observation)

4.4.4 Continued Participation in Project

During the end-of-season reviews, participants were asked if they were interested in participating in the project during the 2011 boating season. All participants who consented to the end-of-season review expressed interest in being a participant in 2011. Study participants were also asked if they knew of any other highly active subsistence harvesters that might be interested in the study. Two additional names were received and the field researcher contacted these individuals prior to the start of the 2011 boating season.

4.5 End of 2011 Season Reviews

In October 2011, eight end-of-season reviews were conducted in Point Lay from the 16 active 2011 study participants. The purpose of the end-of-season reviews was to provide an opportunity for study participants to compare the 2011 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences. In 2011, the field researcher did not review each participant's subsistence tracks and information at the end of the season reviews because these data were reviewed during the trip summary questions. End-of-season reviews were also used to determine if any study participants had noticed any unusual weather or wildlife related observations, to solicit suggestions for possible subsequent years of the project, and to confirm whether or not they would be willing to participate if the study continued into 2012.

4.5.1 2011 Boating Season Compared to Previous Seasons

Point Lay participants reported that 2011 was a good year for marine mammal and coastal caribou harvests. Point Lay whalers harvested a bowhead whale in the spring. Most participants reported that they were able to harvest the walruses and bearded seals they needed. A few participants reported seeing sick seals along the coast, but healthy seals were abundant enough that participants were able to harvest what

they needed for the year. Caribou returned to the coast in abundant numbers, and almost every participant who wanted caribou was able to harvest some by the end of the season. Participants made the following general comments about the 2011 boating season:

> *I think it was a very abundant season. Everything from picking berries to picking eggs was—we were blessed this year. We got the bowhead, we got the belugas, we got the ducks and geese, the* ugruks*. I think people shied away from seals because they were sick, and I think they got what they wanted from the walrus and left everything alone.* (Point Lay Hunter Observation October 2011)

> *Yeah it was a good year for me anyway. Harvested five bearded seals, couple of seals, one polar bear, one whale. I didn't do much fishing.* (Point Lay Hunter Observation October 2011)

> *It was pretty regular year [for harvests]. I usually catch a lot of caribou and a couple walruses. We did have a better year harvesting bearded seals and seals this spring. Yeah, pretty much everything else was the same with the seals and the caribou. I just got one walrus. I'm thinking to go get another one pretty soon.* (Point Lay Hunter Observation October 2011)

> *This was a good summer for harvesting. My freezers are full. Waiting for the snow to fall so I can hunt some more caribou and hang them outside to freeze.* (Point Lay Hunter Observation October 2011)

4.5.1.1 Hunting Activities

Harvest Amounts Compared to Past Years. Most Point Lay participants reported that their harvest amounts in 2011 were the highest they had been for several years. When asked how the 2011 boating season compared to all the boating seasons they had knowledge of in Point Lay, some long term residents suggested that 2011 marked a return to harvest conditions not seen for more than a decade. Two participants said,

> *It almost reminds me of back in the [19]80s when things were abundant. I would have to see a lot more caribou to make it identical. Just the fact that we got that many* ugruks*. There would have been more gotten because we had the time for it. Our land based activities prevented us from getting out there as much as we wanted.* (Point Lay Hunter Observation October 2011)

> *[Harvested] more than two years past anyway. I could say it was the mid-'90s [since I had a year like this].* (Point Lay Hunter Observation October 2011)

One of the most notable changes in harvest amounts from 2010 to 2011 was the return of the Teshekpuk Herd to the Point Lay area. Residents typically travel inland with a four-wheeler or snowmachine to harvest caribou, but may also take their boats into Kasegaluk Lagoon to hunt caribou along the coast. Nearly all participants who wanted to harvest caribou were successful in 2011. As one participant stated,

> *I think this was a pretty fair season for caribou. Yeah it was better than last summer. Just about everybody that went out came back with a caribou. I think the caribou finally just came around.* (Point Lay Hunter Observation October 2011)

Participants shared their thoughts on why the caribou herd returned this year. One participant said that the recent closure of a coal mine 40 miles south of Point Lay reduced helicopter traffic and allowed the caribou to return:

> *I'd say it was a pretty good season all around. Finally had our caribou herds coming back. That's what we haven't seen in a long time, caribou coming around this year. Everybody had a really good season. I'm thinking because when the coal mine was set up*

it messed up the caribou migration. When that started we'd only get small herds here and there. Now there's thousands this year. The coast, inland, even along the spit. More than the past five years. Ever since I was 15, maybe six or seven years. (Point Lay Hunter Observation October 2011)

Another participant suggested that the caribou numbers originally declined due to large numbers of wolves near Point Lay. This participant suggested that wolves in the foothills of the Brooks Range just south of Point Lay might be keeping the caribou north of the mountains. This participant said,

Our caribou season was really good this year. We had an abundance of caribou this summer after having a harsh winter with no caribou around. I think that's what got me to hunt a lot more caribou when they were around Point Lay. I think it might be because of our predators out there. I think we have a large number of wolves in the area. Within the past three years we haven't really had any successful wolf hunts so that just leaves the pack room to grow. I think they [the wolves] just, I think they're out hanging around the mountains and keeping the caribou on the north side of the mountains. That's the wolves' general living area. They're preventing [the caribou] from going south on their migration pattern. (Point Lay Hunter Observation October 2011)

One participant remarked that he noticed the caribou came near Point Lay a little late this year. This participant said that he was able to harvest what he needed:

They're [the caribou] are a little late this year. I filled up my mom's freezer this year. I usually give it away. We haven't really had much year round. That way we can have some throughout the winter. Don't have to get out there and hunt them. (Point Lay Hunter Observation October 2011)

Point Lay harvested a total of 22 belugas in 2010 (Goodwin 2011). In 2011, Point Lay harvested 23 belugas (Goodwin 2012), but participants remarked that the belugas harvested this year were smaller than the ones caught in 2011. The beluga hunt was unusually late – it did not occur until mid-July, (it usually occurs in end of June and early July) – which led some Point Lay residents to speculate that the pod they harvested from was a different pod from the one they harvested from in 2010. Two participants summarized what the study team had been hearing throughout the season regarding the beluga harvest as follows:

Yeah our beluga, it seems like we had a different herd this year. Our normal herd went by, and this herd came through. It seemed like they were a different herd. The beluga themselves were fully mature but they were smaller than normal. Even the biologists said that to me. They were healthy but their fat content wasn't as thick as normal, and [community member] knows that too when she was butchering them on the beach. They weren't as fat as normal but they were healthy, and they seemed lost. I really think that was a different herd. (Point Lay Hunter Observation October 2011)

The belugas were a little different this year. I wasn't involved with the hunt. Normally I'll be on board a boat. This year I had to go away but [my wife] told me that the belugas seemed to be mature but smaller so it could have been a different pod of belugas that we're not normally hunting. We might have missed the group that we usually hunt which is bigger. (Point Lay Hunter Observation October 2011)

Two participants commented that the beluga harvest was smaller than in years past. This is in line with comments participants made about the beluga harvest last year. Two participants said,

There weren't as many [belugas] as usual. We herded them in the inlet mainly two boats until [community member] and them showed up. (Point Lay Hunter Observation October 2011)

Well I've been here like 15 years in Point Lay, and I think the most [belugas] we ever got was 60. (Point Lay Hunter Observation October 2011)

Several Point Lay participants successfully harvested walruses in 2011. One participant commented that he had successfully harvested one female walrus on one of the barrier islands near the village. This participant said,

Yeah, harvested more of everything. We just harvested one walrus but that was enough. We didn't really go after big ones for their tusks. We went after females for the meat. Just on the barrier islands. (Point Lay Hunter Observation October 2011)

Even though the study team did not specifically ask about terrestrial mammals, a single participant said that the large walrus haul-out near Point Lay in the fall seemed to be drawing wolves and wolverines to the coast. This participant said that wolf and wolverine harvests have been up in recent years, possibly on account of the walruses:

There's even reports of people catching a lot more wolverines this year. I caught three. I saw five of them. My brother-in-law caught one just two miles from the village. I think that's because they were trying to get to the walrus haul out to dig them up and munch on them. Usually every year there's about three or four wolves caught around here. Last year there's about one. These past ten years there's about three or four taken except for last year. Like on the fish and game book they give out they've put in there that you catch, instead of 10 wolves you're allowed 15 and instead of one wolverine you're allowed five. And we have been seeing a lot more wolverines. There were about eight wolverines taken last year. (Point Lay Hunter Observation October 2011)

One participant made the observation that there were only 13 active boats in Point Lay during the 2011 boating season, and the fewer number of boats has affected the community's harvest amounts. At least seven boats broke down during the 2010 open water season in Point Lay, and many of them were not repaired during the 2011 boating season. This participant made the following comment about the decline in Point Lay boats:

This season there were only 13 boats. That's way less boats than the year before. Some people are set in their ways so they're not able to get a new motor for them or do proper maintenance. (Point Lay Hunter Observation October 2011)

4.5.1.2 Hunting Conditions

4.5.1.2.1 Weather Conditions Compared to Past Years.

When asked to compare weather conditions in 2011 to previous years, participants stated that the region has undergone significant warming in recent years. Participants consistently reported that break-up is occurring earlier, freeze-up is occurring later, and sea ice is thinner and is less anchored to the coast than in past years. The shift in the timing of the seasons has caused Point Lay residents to alter the timing of their subsistence activities. Five participants shared their observations as follows:

I would say from back then everything is like one month ahead. One month to thaw, one month to freeze. The caribou were a month and a half late. I would say [it's been like this for] maybe three years. (Point Lay Hunter Observation October 2011)

Yeah, we have less ice later in the spring season than years past. It's about normal [freeze-up this year]. I remember trick or treating as a kid and it'd still be summertime. We'd walk out to the DEW line and get some fresh food. (Point Lay Hunter Observation October 2011)

Our winters are…it takes a lot longer for the winters to come. We should have, everything should have been frozen by now. People should be riding snowmachines. It's just beginning to get more and more late. Taking a lot longer. (Point Lay Hunter Observation October 2011)

Yeah, we're thawing out a lot earlier so we're able to go out earlier, and we're freezing a lot later. It's, I think that's one of the big thoughts in my head on the boating season. (Point Lay Hunter Observation October 2011)

Kind of late to freeze this year. Right around when school starts is when it usually freezes. It's already been a month since school started. I freaked out too when I went to Barrow and there was more snow there than there was around here. (Point Lay Hunter Observation October 2011)

Some participants also shared their observations of wind conditions during the 2011 boating season. These participants said that the average wind speed was too high to safely take boats into the water. Two participants offered their views on this year's high winds:

It was just too quick and stormy and windy. Always windy. (Point Lay Hunter Observation October 2011)

The wind was the wrong way all summer long. When it blew it blew too long. Too shallow to get out there. (Point Lay Hunter Observation October 2011)

Persistent winds out of the north and east pushed water out of Kasegaluk Lagoon and also made it too shallow for boating. Two participants remarked that the shallow conditions made it more difficult for hunters to launch their boats into the water:

We got a lot of wind, a lot of north northeast wind which kept the lagoon shallow. Well you remember this year because it just happened, but I've experienced other years where it's extremely shallow. This year it blew so hard in August that almost the entire silt bottom of the lagoon was exposed. It was terribly shallow. That was for almost a three week, a long two weeks anyway. That's why you probably don't have a whole lot of boating activity. ATV activity was abundant. (Point Lay Hunter Observation October 2011)

Yeah we had a lot of east winds for the most part of the summer which kind of brings our lagoon water level down so it's harder to get out in a boat and really access our hunting area. Just this past month, from the 13th to the 30th of September, we had shallow water so that was over two weeks of east wind and shallow water. There were other times during the summer we had east winds for I'm going to say maybe a week to a week in a half where we were just not able to go boating. (Point Lay Hunter Observation October 2011)

One participant added that the early melt, the late freeze and the persistent high winds made it difficult for him to harvest what he needed in 2011. He said,

Everything went too fast. It melted too fast. Hardly any time to go out hunting. The wind, the weather wasn't favorable. Every time we get ready it would be windy or getting shallow and the time we were going to go it started freezing up on us. About the same [as last year]. (Point Lay Hunter Observation October 2011)

Two participants offered a somewhat different view on the season's wind conditions. Both said that Point Lay had experienced a lot of south wind. South wind drives water into Kasegaluk Lagoon and makes it easier for participants to launch their boats into the water. These participants said,

It's been cloudy all summer. I don't know. It was a little bit windy. We had south winds. (Point Lay Hunter Observation October 2011)

A lot of southwest wind. Lot of high tide. Yeah it's easier to get out there in the lagoon. You get more traveling time north and south. (Point Lay Hunter Observation October 2011)

4.5.1.2.2 Water and Ice Conditions Compared to Past Years.

Participants compared the water and ice conditions in 2011 to those of previous years. Participants noted several significant features that characterized the season. First, man-made Cully Inlet, located directly across Kasegaluk Lagoon from Point Lay, opened with the spring thaw. Cully Inlet was a narrow channel in 2010 and participants rarely reported traveling through it because they considered the trip to be too hazardous. The opening of Cully Inlet in 2011 provided a direct, safe path to the ocean for Point Lay boaters, at least for the first part of the boating season. Two participants made the following comments about the opening of Cully Inlet:

Cully Inlet opened up and became quite large, allowing for a safer in and out of the lagoon area. It's closed back up somewhat. Before the inlet was just a little opening and it didn't go straight out in the ocean. You could actually go out in a darker part of the day and miss it. It was [man-made originally]. Air Force. There was a certain amount of dredging going on when the Air Force was hauling gravel. (Point Lay Hunter Observation October 2011)

[Cully Inlet] opened up really big this year but it's a lot narrower than spring time. (Point Lay Hunter Observation October 2011)

One participant said that the Kokolik River thawed before the other rivers emptying into Kasegaluk Lagoon thawed. The early thaw melted some of the ice in front of Point Lay and provided an open path to the ocean. This participant said that the early thaw provided Point Lay with access to ocean ice for the first time in several years:

Umm yeah, we've had a better season I think with our spring and summer as our river close to town thawed out and started flowing sooner than the other rivers. We were able to access our ocean before all the ocean ice left. We were able to go out. Usually the other rivers thaw out before our river thaws out. When this river thaws out it kind of flows to where the water is, and when it does that it flows north or south. We actually had our ocean open up from the river. When our other rivers thaw out before this one it takes longer to thaw our lagoon. By that time the ocean ice is just gone. That's been the case the last three or four years. This year we were finally able to access the ocean ice for bearded seal hunting and hunting other seals. (Point Lay Hunter Observation October 2011)

A total of four participants said that Kasegaluk Lagoon was shallow this year. One participant pointed out that the lagoon was also shallow last year, and another said that the lagoon seems to be getting shallower. These participants shared their observations as follows:

It kind of seems like our lagoon is getting shallower. We had a lot of silt. Mud flats seems like we're getting shallower. Even when the lagoon empties out I see new mud flats right in front of town. It's got to be from the rivers washing out in the springtime. (Point Lay Hunter Observation October 2011)

It's been kind of shallow this year. It seems shallow. It's hard to get out there when it's shallow. When it gets deep it gets rough. Like my days off, like too bad I can't go. I don't know, I haven't really noticed. I just noticed it's been kind of shallow this year. (Point Lay Hunter Observation October 2011)

Then of course the shallowness of the lagoon was a factor this year too. We can't discard that. Some of our channels have changed or filled in with silt. When it got extremely shallow we got to see how few channels we had left compared to 10 years ago. (Point Lay Hunter Observation October 2011)

Nope, it's almost like the same. Last year, every other year. It got shallow. (Point Lay Hunter Observation October 2011)

4.5.2 Subsistence Resource Observations

Participants were asked during trip summary questions and at the end of the season to share their observations of animals they observed and harvested while conducting offshore subsistence activities. The study team asked participants to comment on the health, behavior, abundance, and distribution of animals they observed offshore in the vicinity of Point Lay. Most participants reported an increase in the abundance of marine mammals during the 2011 boating season as compared to the 2010 boating season.

4.5.2.1 Health of Animals

Participants shared numerous observations of sick animals throughout the boating season; observations of sick seals and walruses were the most common. Point Lay participants reported seeing sick seals and walruses hauled out on the beach throughout the summer. Two participants said they saw walruses hauled out on the beach that were immobilized, in some cases sick enough to allow humans to approach them:

Yeah we saw two very sick adult walruses. I've seen sick ones in the past but not to the point where they can't get up and walk away from you. These guys were everything but dead. Real hard labor breathing and we had left them. (Point Lay Hunter Observation October 2011)

I've never seen walruses like this before. Right now they're sick. They can't even go anywhere. They try to; they can't lift up their bodies themselves. Before that, [back in the] 50s, 60s, 70s, they were active. They could crawl all over on top of each other sometimes. Nowadays they're weak. They used to be strong. (Point Lay Hunter Observation October 2011)

Another participant attributed his observations of tired and sick walruses to lack of sea ice. Without an adequate quantity of sea ice, walruses were forced to swim long distances between their feeding grounds offshore and their resting grounds on the beach. This participant said, however, that he only saw a few tired walruses out of a population that may have been as high as 7,000 at one point. This participant said,

Yeah it does seem like our walruses are tired, mostly I think from having to swim out into the ocean to access their feeding grounds, then having to come back to shore to rest. We did see a few sick ones that were just exhausted but there weren't many of them. There are about five to seven thousand is what I think is out there the last time I saw them. Most of them look pretty healthy but we're kind of in the middle of getting samples right now. (Point Lay Hunter Observation October 2011)

A third person reported seeing a large number of dead juvenile walruses throughout the boating season, a trend which he said has been in place for several years and which he attributed to climate change. He said,

I have a bad feeling for [the walruses] though. Eighty dead juveniles this year and last year and the year before. That is a direct tie to climate change. (Point Lay Hunter Observation October 2011)

As in Wainwright, several Point Lay participants also reported that large numbers of sick seals began hauling out on the beaches near the community in the summer. Local explanations for the presence of the sick animals included excessive summer heat and buried toxins; others cited natural causes as the reason

for the appearance of sick seals. One participant said that he had witnessed a number of sick spotted seals on the beach, and added that he had also seen sick bearded seals, sick walruses, and some dead eider ducks. Participants shared their observations regarding the sick marine mammals as follows:

> *A lot of sick seals, [ringed seal]. Couple of bearded seals me and my crew got their hair wasn't all there. They were already molted, the big ones anyway. I found maybe five or six eider ducks dead. [More than usual]. It was, I think it's the heat. Yeah. There's a lot of sick walruses, seals, a few I saw bearded seals, ducks, eider ducks. From Eleven-Mile north that's where I saw most of the sick animals.* (Point Lay Hunter Observation October 2011)

> *And we saw a spotted seal. Its face was completely orange and it was bleeding out of the anus and it wouldn't move away from us out of the beach. It didn't have the energy to move. It finally wiggled its way into the water but we could tell it didn't want to go into the water.* (Point Lay Hunter Observation October 2011)

One individual discussed that the sick animals on the beach near Icy Cape might be due to buried toxins at the old DEW line site. This person said,

> *Down by Icy Cape there's been a lot of reports of sick animals in that area. There's a few people who have gone down there. When they walk up on the land they noticed that there's drums buried in the ground from the old DEW line site. They didn't dispose of their fuels the right way. That's why everybody thinks the animals are getting sick.* (Point Lay Hunter Observation October 2011)

Commenting on the local walrus and ringed seal populations, several participants noted that both species appeared to be stressed and are the subject of ongoing studies to determine the cause of the sickness:

> *The ringed seals, we've seen a number of sick ones and dead ones. The walrus population looks healthy, but this year more than ever we've seen a lot of sick ones. The mortality of the juveniles is high this year. The ringed seals have some sort of bug. They're sick up and down the coast. There's some kind of study right now. The walruses seem exhausted. That would allow for a sickness that they wouldn't get if they were healthy. That's also subject to an ongoing study.* (Point Lay Hunter Observation October 2011)

> *Then, of course, the ringed seals we've been spotting dead and dying ringed seals all year. It started during break-up and it continued all summer and it's been going on all year. That prompted these studies with the NSB and the state.* (Point Lay Hunter Observation October 2011)

NOAA is currently investigating the cause of the sick animals, and as of March/April 2013 had not yet determined the cause of the outbreak (NOAA 2013).

Three participants reported seeing lethargic or sick seals on the beach, but none attributed their observation to anything other than natural causes. These individuals shared the following seal observations:

> *That one [spotted] seal pup, I have a feeling it was abandoned.* (Point Lay Hunter Observation June 2011)

> *One sick* ugruk. *It was moving slow and it wasn't trying to get away from us. Could see the hip bones. Guess old age. They do that when they get real old.* (Point Lay Hunter Observation June 2011)

> *During the past month there's been some seal pups on the beach. I walked right up to one. I stopped at about 10 feet and just left it. I took a picture.* (Point Lay Hunter Observation July 2011)

Point Lay participants also provided health observations related to beluga. Two individuals who commented on the beluga pod said that the belugas in 2011 were smaller than usual, had thinner skin, and a greater percentage of them were female. One of these participants said that Point Hope hunters thought killer whales had pushed the main pods north much faster than the pod Point Lay harvested from. These participants said,

> *They were mostly female, that's for sure. They were like teenagers. I think out of all of them maybe one was a big one. One had a fetus. The females were unusually small for one having a fetus. I don't know if this is a different pod or whether it's the same stop. There were some other people saying that they were unusually small, the females. The biggest one was like, not like the big females we used to catch in the past.* (Point Lay Hunter Observation July 2011)

> *I don't have it on my GPS, but we seem to have a different herd of belugas thus year. They're smaller animals and they seem to be lost. When they were at Point Hope the Point Hopers said they were getting pushed by killer whales. I think they were trying to run away from them, and they got pushed up here well after the main herd went by. The skin of the beluga also seems thinner even though they're fully mature animals and the biologists also mentioned this too. If it wasn't for this different herd then we would have completely missed out.* (Point Lay Hunter Observation July 2011)

One participant who wasn't present in Point Lay for the hunt added that the beluga appeared healthy and tasted fine. He said,

> *I never made it out beluga hunting but I went across and helped butcher. Put them in piles. The beluga this year seemed really soft. Real good* maktak *[whale skin with blubber], like you had no teeth you'd still be able to bite right through it. It will just melt in your mouth.* (Point Lay Hunter Observation October 2011)

Besides the observations related to walrus, seals, and beluga, participants provided few comments regarding the health of other species in the area. Two individuals discussed having observed skinny polar bears in the area. One participant commented on the polar bears he had seen during the spring bowhead hunt. This person noted that he had seen as many as seven malnourished polar bears during this period of time, saying,

> *Yeah, there were six or seven that looked skinny, polar bears. That was a few of them that didn't look like they had much of a belly on them.* (Point Lay Hunter Observation June 2011)

Regarding the brown bears, however, one participant said that they appeared to be healthy, possibly because caribou numbers near Point Lay were up in 2011. This person explained,

> *Seem normal still. I noticed the [brown] bears are really plumped up this year. These are all healthy good looking bears. My guess is because of the caribou they're following.* (Point Lay Hunter Observation September 2011)

4.5.2.2 Distribution

While in response to questions about local abundance changes, many of the participants provided observations of changes in distribution of animals that affected local abundance. These changes in distribution were primarily related to beluga, bearded seal, and caribou. The majority of participants' 2011 observations regarding distribution of subsistence resources revolved around the lack of sea ice and

the resulting changes in the distribution of these species. These changes in distribution in turn affect local abundance and can lessen subsistence harvests.

Point Lay engages in an annual community wide beluga hunt. The community typically holds the beluga hunt in June or July; wind conditions, water conditions, and the location of migrating beluga pods determine the exact date of the hunt. The beluga hunt is typically the largest coordinated hunt the community will engage in all year and may involve up to 50 community participants at one time. In 2011, multiple community members reported that the beluga hunt occurred unusually late. As one participant said,

> *Beluga pod was about the same. This was kind of late on the 11th. We usually get them at the end of June, first week of July so everybody was thinking that we missed out on the beluga hunt this year.* (Point Lay Hunter Observation July 2011)

One participant attributed the difficulty in timing the year's beluga hunt to a persistent low tide that prevented community members from engaging in scouting activities. This participant said,

> *There was some. They just stayed overnight then they all took off. The rest of them took off. Not the beluga this time. I didn't want to find out if that was the first pod or the last pod. I just told all those guys to get them. I didn't want to lose the chance of getting our beluga. This year I had low tide for so long I didn't have knowledge of it was the first pod or the last pod. It turned out to be the last pod so it was a good decision.* (Point Lay Hunter Observation July 2011)

Another participant suggested that the community may have missed the first beluga pods simply because nobody had gone south to look for them:

> *Nobody had gone down south to set up camp to spot for the beluga. They would stay right there at the inlet. Once they spot beluga they would relay it to Point Lay. Nobody had done that this year.* (Point Lay Hunter Observation July 2011)

All participants who saw bearded seals said that they were more locally abundant in 2011 than they were in 2010. One possible reason for the increase in their abundance was the presence of sea ice later in the season as compared to recent years. Participants had the following to say about the local increase in bearded seal numbers due to changes in their distribution related to sea ice availability near Point Lay:

> *Lots of [bearded seals] on the first trip. Every trip we went out we saw a lot of them. So close to the big pieces of the ice that they would just swim under and go back to their hole. A lot of people in town have caught two or three of them. Almost every boat caught two or three.* (Point Lay Hunter Observation June 2011)

> *There were quite a few bearded seals this year. It's not following the pattern of past few years probably because of the ice. The ice stuck around a bit longer this year.* (Point Lay Hunter Observation August 2011)

> *Well with the seals there's been more, I've seen more seals this year than previous years. It just seems like they have no ice to ride on, no ice to rest on, and depend on to eat to reach their feeding area.* (Point Lay Hunter Observation October 2011)

> *The* ugruks*, they were very abundant this year. They allowed Point Lay to get, I forget the count, 10* ugruks *maybe. This year the ice was here long enough that people were able to get them.* (Point Lay Hunter Observation October 2011)

Two participants commented on the distribution of bearded seals near Point Lay. One participant said that he saw more bearded seals south of the village, and that they are normally more evenly distributed north and south of town:

> *It was kind of weird that we saw more of the bearded seal down south than up north. We didn't see any up north at all. On the beluga hunt we actually went down south we could see a lot of bearded seal. They're usually pretty much everywhere.* (Point Lay Hunter Observation July 2011)

When asked if they had noticed any unusual concentrations of seals, one participant said that bearded seals are frequently found at the inlets to Kasegaluk Lagoon north of Point Lay. This participant said,

> *I never got out there in time to get* ugruks *this year. Last year too, we had to go up north. The ice took off before anybody could get up there to get any seals, but they're always hanging up north in the inlets. You can manage to find them if you hang around long enough at Eleven-Mile and Utukok. Utukok around this time of year, maybe last month, this time of year when it starts getting real rough out there. At least 150 seals hang out on the beach over there at Utukok at north side. I don't know why they pick the north side, but that's where they always sit. About this time of the year too when it's real rough out there in the ocean they always come into the inlet, Five-Mile up north along them islands. Eleven-Mile, Five-Mile got islands to the south of them. Used to see* ugruks *on the islands. I got four on the islands down south. They manage to come in every year just as we get out there when they're there.* (Point Lay Hunter Observation October 2011)

Another participant said that he had seen a seal breathing hole on a local river located near Point Lay. He said that it was the first time he had ever seen a seal hole on any of the local rivers:

> *Last winter, there is one weird thing, there was a seal that had made a hole on the river instead of out in the ocean. I have never seen that before until last winter.* (Point Lay Hunter Observation October 2011)

In September of 2010, thousands of walruses hauled out on the barrier islands across Kasegaluk Lagoon near Point Lay. Thousands of walruses again hauled out on these islands in September 2011, though at a location several miles north of Point Lay. Participants noted that the large haul outs have occurred for several consecutive years now and are beginning to bring outside attention to Point Lay. Participants had the following to say about the local walrus population:

> *The walruses are bringing a lot of attention. People are beginning to notice them. The haul-outs are different areas along the beach but they're coming together making it seem like there's more.* (Point Lay Hunter Observation October 2011)

> *We had our walrus haul out last year. People have been catching walruses. They're still around. People were saying that they had moved on toward Cape Lisburne but it seems like they've come back this way. More of them went out yesterday and they've seen a lot of walrus.* (Point Lay Hunter Observation October 2011)

> *The main change in the last few years is the walrus that show up here. No I haven't really noticed any changes in their health. There are always a couple sick walruses or tired walruses. I haven't seen any sick caribou. I haven't noticed much change. Yeah, I think that's the main change [walrus hauling out] in our subsistence hunting area is the walrus haul out that seem to be close to town. I don't know for what reason. It might be our floor shelf in the ocean might be closer in the ocean than areas north or south of us.* (Point Lay Hunter Observation October 2011)

A few participants also provided comments about the distribution of other marine mammals. One participant said that the bowhead whales were not as close to the shore as in years past and suggested that this might be because their feeding ground has also moved out to shore. The other participant said that he

had seen seals entering the river inlets inside of Kasegaluk Lagoon. While this participant said that this behavior wasn't unusual, he did add that he's been seeing more seals in the inlets than he did in the past:

> *No not unusual [to see seals in the river inlets], just more often in the inlets they're there. The seals are coming to our inlet more often most likely to eat some fish and rest on the beach.* (Point Lay Hunter Observation October 2011)

Participants reported that the massive walrus haul-outs in the fall are attracting brown bears to the barrier islands and causing stampedes. This participant said,

> *We've seen evidence of bears on the barrier island. The bears are one reason why there have been so many [walrus] stampedes. We've also seen evidence of bears dragging walrus carcasses across the barrier island. It just goes to show that when food is plentiful so are the bears.* (Point Lay Hunter Observation October 2011)

Another participant observed that the walrus harvests near Point Lay appeared to be drawing polar bears near the community, saying, "We've seen a lot more polar bears because of the walrus harvest this year. They'll come up to the spit and dig up the shore until they reach the walrus carcasses" (Point Lay Hunter Observation October 2011).

As previously mentioned, the Teshekpuk Caribou Herd returned to the Point Lay area in 2011. The Teshekpuk Caribou Herd's range includes the Arctic Coastal Plain, particularly in areas west of Prudhoe Bay, with some overwintering south of the Brooks Range. The herd is named for the concentrated calving that consistently occurs around Teshekpuk Lake. Participants reported that caribou numbers were up sharply in 2011 due to changes in their distribution. When asked if they had any thoughts on why the caribou returned, two participants said that the rise in numbers might be related to the closure of a coal mine south of the village that generated a lot of helicopter traffic in the summer. These individuals said that the caribou were now abundant enough for everyone who wanted caribou meat to harvest one:

> *It's not a caribou study but the caribou are coming back. We were actually given enough caribou that we were given caribou. I think it's quite the coincidence [that they're coming back now that helicopter traffic is down] but I don't think it's the only factor. Look at Wainwright and Atqasuk. They still have a healthy caribou season yet they have caribou lying down in their front yards.* (Point Lay Hunter Observation October 2011)

> *Look like the Teshekpuk herd was around here. We've got satellite tag images from the NSB and they were the Teshekpuk herd. Yeah, [the coal mining operation] hasn't been going on for two years now. It did, you know, the helicopters going back and forth back them. It was pretty quiet this season. We had one helicopter for three days but that was after the caribous arrived.* (Point Lay Hunter Observation October 2011)

Another participant said that the good vegetation growth and overall health of the tundra may have been a factor in the return of caribou to the Point Lay. This person said the following about the return of the Teshekpuk caribou herd,

> *It's nice to see the Teshekpuk Herd come through. Lots of people harvested caribou. No [thoughts on why they've returned]. I don't know. Must have had a lot of good vegetation growth this year. We had a lot of cottonweed. We had a lot of that growth; we had a lot of salmonberries and blueberries [ripen in the fall]. Our tundra seemed to real healthy this year. I imagine there was a lot of lichen.* (Point Lay Hunter Observation October 2011)

Several other individuals also provided explanations for the return of the caribou herd to the Point Lay area including cool weather near Barrow and disturbance by brown bears. They said,

> *The caribou are pretty abundant north and south of here. There are a lot of caribou. A lot of people have been harvesting caribou. At least every day at least one person would come back with one. I'm not really sure [why they're coming back]. We had a lot of cool*

weather so that might have been part of the reason why they've been moving a little bit south. They're usually up in the Barrow area until the snow starts falling. (Point Lay Hunter Observation August 2011)

No pretty much the same thing every year when the caribou come to the coast until brown bears come and disturb them. They head inland after the brown bears come to the coast. There were a whole bunch along the coast north and south until we spotted brown bears. Since then we haven't seen any caribou along the coast. (Point Lay Hunter Observation October 2011)

Individuals also noted rare sightings of animals that are not typically seen near Point Lay. None of these participants offered an explanation for their unusual sightings. These participants said,

First time we saw a porpoise this year. It came right to the edge of the ice. (Point Lay Hunter Observation June 2011)

Just a muskox. Yes [seen them before], they just don't come around much. Every few years they seem to come up. (Point Lay Hunter Observation September 2011)

During one of those nights we had a porpoise come up to the edge of the ice just around. No idea why it was there. We did see a brown bear out there one day when we were breaking trail. That was surprising, scavenging for food. (Point Lay Hunter Observation June 2011)

There were a lot of different bugs this year. Even different birds. Small little tweety type birds. I don't know what type they were but a lot of different kinds anyway. (Point Lay Hunter Observation October 2011)

4.5.2.3 Abundance

Participants provided observations regarding the local wildlife abundance near Point Lay. Most of participants' observations focused on changes in distribution of beluga whales, bearded seal, and caribou that brought them closer to Point Lay rather than an actual increase in population numbers. Overall, most participants reported that animals were abundant, even if there were a lot of reports of sick animals on the beaches near the community. As one participant said, "There's a lot of animals this year" (Point Lay Hunter Observation June 2011).

Three participants reported an increase in the bearded seal population near Point Lay. The field researcher asked these participants if they knew why the seal population increased in 2011. One participant suggested that they might be following sources of food, but did not provide any more details. These participants said,

We had quite a few bearded seals this year which was nice compared to last year. I don't know [why there were more this year], maybe food brought them back. Just following the food. (Point Lay Hunter Observation October 2011)

Yeah there were a lot of seals. No [no thoughts on why there were more] but we did see a lot of seals this fall on the beaches. No ice. (Point Lay Hunter Observation October 2011)

Well there were a lot more seals. Thousands of seals this spring. This year I caught about four seals. I don't usually catch seals – maybe one a year. (Point Lay Hunter Observation October 2011)

A few participants commented on the high abundance of some of the other species they observed while traveling offshore near Point Lay in 2011. They made the following general comments about the abundance of these animals:

There seem to be a lot of belugas. We've got reports of belugas in Point Hope, Point Lay, Wainwright, Barrow. The pods that we usually keep track of got past us. Plenty of ducks and geese. This was the biggest year we ever had for berry collecting. Now that we have more ATV travel people are getting different areas that people had never gone to. That might play a role in that; I'm sure it does. It's nice to know that there's more berries out there than the few patches that we were used to. We didn't put a lot of effort into gillnetting this year. [Name withheld] and I got our net together but didn't have time to do it. Actually when we wanted to do it [but] it was shallow. (Point Lay Hunter Observation October 2011)

Yeah I saw a lot of polar bears this year out on the ice. Might be lucky to see one or two while we're out there whaling, but I saw six or seven. There were polar bears out there constantly. (Point Lay Hunter Observation October 2011)

4.5.2.4 Behavior

During trip summary sessions, participants reported seeing unusual behavior in seals, walruses, and polar bears. Multiple participants directly attributed changes in marine mammal behavior to climate change. One participant said that lack of sea ice is affecting seal and walrus behavior. This participant observed that lack of sea ice is causing a recent increase in seal and walrus haul outs on the beaches near Point Lay. He said,

Well, the seals have been coming onshore onto the land more frequently than previous years. I think it's because of our ice. It hasn't been there. Same thing with the walruses too. They've been onshore here for almost a month now. I think they go out and feed and then come back to shore because there's no ice for them. Yeah, I guess our northern ice cap has been melting so all the ice that does form over the winter is mostly first year ice which melts over the summer. That's been the case here the last few years with our walruses and seals. They come to shore here near town because there's no ice for them to rest on. (Point Lay Hunter Observation October 2011)

As in 2010, large numbers of walruses hauled out on the barrier islands near Point Lay in August and September of 2011. One participant made several trips to observe the walruses' behavior, and noticed that they were swimming in circles near the shore, possibly looking for food. This participant said that the walruses appeared to haul out in an area, exhaust its food resources, and then move to a new area along the coast. As this participant explained,

There's signs of multiple stampedes by the walruses. It's right in the middle of the barge season. When [name withheld] and I were in the ocean this trip before last, we noticed the walruses, they would swim south, stop, bob for a while, then turn around and go north. They would swim around in circles for days. It might have been to wait for the main herd to beach together. I don't know what's the driving force to pick a particular beach to haul out. Swimming in circles, they're looking for good feeding grounds. Then they quickly feed that area out, they exhaust it. (Point Lay Hunter Observation October 2011)

Three participants reported seeing multiple polar bears during the spring whale hunt. On several occasions the polar bears tried to enter the community whaling camp. One participant suggested that it was unusual to have polar bears attempting to enter the camp. Another participant said that the bears looked malnourished, possibly due to a lack of sea ice. Participants offered the following range of comments about the polar bears they saw:

We did have quite a few polar bears that came around the camp and weren't afraid to come closer. They usually scamper on real quick. (Point Lay Hunter Observation June 2011)

Just the polar bears that we saw, they came really close. The bears were trying to come to camp. They were really skinny. They had really long necks because they were really skinny. I'm thinking they're stuck out there on the water trying to make it back to the main ice. They're not only traveling by foot they're also swimming. There's not enough ice. They have to travel longer and farther to reach the main ice. They caught one while they were harvesting the whale. It was a healthy polar bear. Nine footer. I believe they bring [the meat back] and took what they can from it. (Point Lay Hunter Observation July 2011)

Polar bears. Saw three of them. One the first day we went out. Three days later we saw another one. That's the day we were chasing a whale. I didn't have my GPS with me. Unusual that they were trying to come to our camp. Three days later we saw one where were chasing a whale. It was on a piece of floating ice. It was swimming or knowing that there were whales around. Every time a whale would come it would go back and forth. (Point Lay Hunter Observation June 2011)

During the January 2012 community review meeting, two residents reported observing unusual salmon activity at the close of the 2011 open water season. They recounted catching approximately 30 to 50 salmon while ice fishing in October and indicated this was an unusual event to see salmon in the lagoon this late in the year.

4.5.3 Project Suggestions and Feedback

Before concluding each end-of-season review, the field researcher reminded each participant that 2011 was the last year of the COMIDA study (the study team subsequently received an extension from BOEM to continue the study for 2012). The field researcher asked participants to share any thoughts or suggestions they had about the COMIDA project. All participants said they were pleased with the project and some expressed thanks for the fuel vouchers and the GPS units. Three participants shared their thoughts on the COMIDA study as follows:

The GPS's are pretty good because you get to go back to the same locations. I never really went out with a GPS, but when you have a GPS you can go right out to the same spot. I thought that was pretty neat to have a GPS on hand when you go out. Then you can come back and show everybody where you went. (Point Lay Hunter Observation October 2011)

It seems to be a real good project having our animals noticed where they're at and what kind of animals they have here. Kind of brings our harvest numbers in reports in perspective that a lot of people here do depend on these hunts. (Point Lay Hunter Observation October 2011)

That gas it always really helps us, especially our whaling crews. (Point Lay Hunter Observation October 2011)

One of the most frequent suggestions received was that the study should include terrestrial subsistence trips as well. One participant said that he would like to see the study expand to include terrestrial trips provided it continues for one or more years. This participant said,

Maybe you guys could start, instead of the coastal, try to learn about what the land. Then you guys would be taking in a lot more information. (Point Lay Hunter Observation October 2011)

Point Lay residents were asked to share their thoughts on a possible extension of the COMIDA study after some Wainwright participants expressed interest in continuing the study. One participant said that he supported an extension, but added that the final decision should be put to the entire community of Point Lay. He said,

> *I would have to say let the community decide. For me yeah, it'd be nice to have another year, maybe one more year.* (Point Lay Hunter Observation October 2011)

4.6 End of 2012 Season Reviews

In October and November of 2012, the field researcher conducted six end-of-season reviews in Point Lay out of the 13 active 2012 participants. As in the previous three years the purpose of the end-of-season reviews was to provide an opportunity for study participants to compare the 2012 boating season to previous boating seasons and to provide observations about the field season that may provide context for any notable differences. In 2012, the field researcher did not review each participant's subsistence tracks and information at the end of the season, because these data were reviewed during the trip summary questions. The end-of-season reviews were also used to determine if any study participants had noticed any unusual weather or wildlife related observations, to solicit suggestions for possible subsequent years of the project, and to confirm whether or not they would be willing to participate if the study continued into 2013.

4.6.1 2012 Boating Season Compared to Previous Seasons

When asked to compare their 2012 boating season to previous seasons, Point Lay participants provided comments related to their hunting activities and harvest amounts or weather conditions which are discussed below. One active hunter discussed that his 2012 boating season was not a typical one because he had mechanical problems with his boat and was unable to hunt offshore as much as he would have wanted. He explained,

> *I didn't do much boating this summer. I usually wait until August to go look for fat caribou, but I didn't do much boating. I started having problems with my motor last spring, and I replaced it and I had more trouble with it and I kind of gave it up on it. I finally threw in the towel about a week ago, and that part's going to cost me about $1,200.00. Right after I replaced the [unintelligible] and till it worked great for a while and then it went out for me. That was the time I went out to meet the Coast Guard and then the trim and till went out that time. I never put my boat back out in the water after that.* (Point Lay Hunter Observation October 2012)

4.6.1.1 Hunting Activities

Harvest Amounts Compared to Past Years. The community harvested a bowhead whale in the spring of 2012, but lack of sea ice and low wildlife numbers made it difficult for some participants to harvest bearded seals and walruses as the season progressed. Reported harvest amounts for bearded seal, however, were higher in 2012 than 2010 or 2011. The community harvested fewer belugas in 2012 as in 2010 or 2011. Participants said that caribou and salmon were more abundant than usual and reported harvest amounts for both species were higher in 2012 than in previous years.

During the six end-of-season reviews, half of participants indicated that 2012 was a typical year for offshore harvests. One participant summed up what appeared to be a typical harvest season in this way,

> *It was alright. It was probably the same as last year, but I didn't get to go out as much. The harvest was the same.* (Point Lay Hunter Observation October 2012)

The other half of participants who completed the end-of-season review reported harvesting less than previous years; one of which reported that they harvested less because they were injured and couldn't

participate in as much hunting in 2012. One participant characterized his 2012 harvests as the worst they had been compared to previous years. This same participant went on to add that his poor bearded seal harvest was partially due to the relative scarcity of the species this year:

> *Not too good this season. I don't think I caught an* ugruk*, holy cow. I shot a couple of them but I never put them in the boat. They sunk. That's because my harpoon tip was dull. I sharpened up my harpoon tip [which is used to retrieve the bearded seal when shot in open water], and I accidentally took my dull one. After that one they were already scarce by then.* (Point Lay Hunter Observation October 2012)

4.6.1.2 Hunting Conditions

4.6.1.2.1 Weather Conditions Compared to Past Years

Point Lay's 2012 boating season was warm, wet, and windy, much as it was in Wainwright. Overall, weather conditions were similar to the last two seasons. The one notable exception was the fact that the sea ice lingered a bit longer in 2012 than it did in 2010 or 2011. One participant summed up the season in this way,

> *The weather was pretty cooperative. You just had to time your trip with the weather like every summer. Ice conditions were pretty good, break-up time hunting. Weather was pretty nice overall.* (Point Lay Hunter Observation October 2012)

The most unique feature of the season was the direction of the prevailing wind. Winds near Point Lay are usually out of the northeast. In 2012, however, the prevailing wind for much of the summer was out of the south (15 percent of trips reported wind from the south or southeast compared to six and seven percent in previous years). The south winds kept the lagoon shallow and possibly contributed to the warm conditions Point Lay experienced for much of the summer. Point Lay participants had the following to say about the wind and its effect on subsistence during the year:

> *We had a lot of south wind. Yeah, it was rough out there. I don't know about the season. We had south winds one after the other. We had a series of big weather systems.* (Point Lay Hunter Observation October 2012)

> *It did seem that our wind was different than previous years. It's keeping our lagoon shallower longer and our wind was…our winds are just steady winds. It's keeping it shallow. Yeah from the inland is what's making it shallow and keeping it shallow. It will keep it shallow for a week or two weeks.* (Point Lay Hunter Observation October 2012)

> *I think our prevailing wind has changed to the south, southwest. It's been dominating the winds have been dominating form the south and southwest. It's warmer air and high tide in the lagoon and it's not favorable for salmon fishing. The current has to be going out when the salmon come in.* (Point Lay Hunter Observation October 2012)

Other notable features of the season include persistent precipitation in August and September followed by a mild October and a late freeze-up. The mild weather expanded the length of time participants had access to open water, but the damp conditions made it difficult for participants to actually go boating. Two participants made the following comments about this part of the season:

> *We had a lot of wind, maybe more than usual, but fall season the whole month of August was rain everyday and then half of September was a lot of rain. All rain too. We could still go boating right now if we want to. It's just a matter of taking your boat across the lagoon to the ocean open. I might just do it, I don't know. I might try to get a bearded seal. Actually we're getting some from Wainwright. Some relatives are sending them this way.* (Point Lay Hunter Observation October 2012)

We're boating real late in the fall. Our area, our lagoon usually freezes up by October but it's been warm. We've had warm weather. Yeah last year was like that too, but the year before that it wasn't like this. Last year, yeah, we were boating into the first week of October. Yeah it was just the last two years. (Point Lay Hunter Observation October 2012)

4.6.1.2.2 Water and Ice Conditions Compared to Past Years

One participant shared a lengthy observation of sea ice conditions during the bearded seal season. This participant said that although the ice lingered for a while after break-up this year, pieces of sea ice were few and far between and the main body of ice was still 20 miles offshore. This participant said that the ice, though present, was too inaccessible to allow him to easily access bearded seals:

Yep, the ice was scattered and all the big chunks were five miles to 10 miles to the next chunk of ice, and that chunk of ice might only be three mile circumference, some of them five almost [miles apart]. They were kind of that far apart. To get to the main ice, that was man…25 miles offshore, and then you have only small scattered ice. They might only be the size of mine and [name withheld] house together. It was difficult to go way offshore this year. The ice was too far apart. When we got to the main ice that time it was so broken up it was rotten. We couldn't even travel inside of that because it was so jam packed. It was rotten. Couldn't even get to the bearded seals. (Point Lay Hunter Observation October 2012)

4.6.1.2.3 Wildlife Disturbance form Air and Watercraft

The 2012 study year was the first year the study team added a specific query to the trip summary questions that addressed the presence of unusual aircraft and watercraft near the community. While the question did not directly address the issue of subsistence interference from aircraft and watercraft, participants were candid and forthright when they thought the presence of these crafts had impacted subsistence harvests.

Point Lay participants reported both a large number and a large variety of crafts near the community during the boating season. Point Lay participants reported more often than Wainwright participants that these crafts were interfering with subsistence activities. The majority of reports involved fixed wing aircraft involved in wildlife studies. Participants usually said these aircraft were flying too low and sometimes scaring the wildlife away:

I've just seen these survey flights. They're either the Coast Guard or the oil companies doing surveys down the coast. We were notified that there'd be survey planes that would be flying down the coast. When they did survey they were surveying the mammals. When we did talk to the Coast Guard, they would report their activities here. They would report that they seen a pod of belugas south of us and a pod of belugas north of us. But yeah, this is kind of the first year that the survey planes came around Point Lay and did a few flybys. The belugas that we tried to harvest were still close to shore. They weren't spooked out to the open ocean. I think when we tell them they've got to be a minimum of 2,000 feet, up to 3,000 feet. (Point Lay Hunter Observation July 2012)

Yeah, it didn't seem like the belugas were really gathering down south like normal, but we had a plane hanging around counting belugas so I think that's why they didn't hang around here. They went straight on to Wainwright and Icy Cape. I don't think it was anything natural. I think it was that [Fish and Wildlife] plane. (Point Lay Hunter Observation October 2012)

> *I saw an airplane just buzz my head. That plane was well below, it was about 100 feet. That was the walrus survey.* (Point Lay Hunter Observation October 2012)

> *There was a plane yesterday that was flying really low that we were wondering about. It kind of looked like Era's caravan, but it wasn't at the right time. We were wondering what was going on, and we got mad cause there was caribou out there that they were scaring. They were flying lower than the street poles.* (Point Lay Hunter Observation October 2012)

> *Yeah helicopter and plane traffic…quite a bit. Yeah, that Borough Wildlife plane was I guess doing a beluga study, and they were flying over the water in the spit real low for days on end. Search battery for the belugas, counting them, and they flew real low over us one day over on the south end of the lagoon. I don't know if they were chasing the animals away, but it was bothering me.* (Point Lay Hunter Observation November 2012)

One participant said that Era had been flying their aircraft too low, not flying their regular flight plan, and thus scaring the caribou, saying,

> *I noticed they're a little farther than last year. Usually they're scattered around Point Lay. I called my cousin, and he said they're all over in Wainwright. A big factor in that is Era; they fly low and start scaring our caribou. We're going to start petitioning to get them to fly their regular route. It really disturbs the caribou. It causes us to spend more money to go farther to get the food.* (Point Lay Hunter Observation October 2012)

Two participants reported observing helicopter traffic near Point Lay. One participant did not say the helicopter traffic was disruptive, only that the traffic and the study associated with it was very noticeable,

> *We've had quite a bit of helicopter traffic. This was one of their refueling areas, and they were in and out of here quite a bit. There are about 12 to 15 55 gallon drums sitting at the airport. I don't know who they were. They were USGS, I think doing something with mapping. NOAA. They said a bunch of entities would use their study. They were flying back and forth putting their instruments up and checking them every day, however often they needed to.* (Point Lay Hunter Observation November 2012)

Another participant said, however, that he thought the helicopter traffic had disrupted the caribou. He said

> *Shell's chopper flying around. We saw a Canadian ice breaker out here. I don't think the ice breaker disturbed anything, but the chopper, yes, with the caribou.* (Point Lay Hunter Observation July 2012)

Point Lay had one of the poorest beluga harvests in recent memory. While community members cited multiple reasons for the poor harvest, one participant said that barge traffic was one of the contributing factors. This participant said,

> *The number of our belugas was lower than normal. Usually when we herd the beluga it's a mile stretch of belugas that we'll herd. This year our herding and our harvest was really low. I think that's from all the barge activity we've had in the recent years and has made an impact on the way the beluga travel. I don't think it was enough beluga. Usually we will harvest enough to last us until the next year, but I'm pretty sure we'll be out by December.* (Point Lay Hunter Observation October 2012)

Two other individuals reported observing barges and ships near Point Lay. One reported observing a blue and white ship approximately three miles offshore, and another noted a barge passing close by on the participant's fishing trip. Neither individual provided any other details regarding the sighting or whether the activity had disrupted their offshore subsistence hunting.

4.6.1.3 Subsistence Resource Observations

4.6.1.3.1 Health

There were few reports of sick animals during the 2012 boating season. The reports of sick animals participants shared did not appear to indicate a pattern, and no participant expressed serious concerns about the health of the animals overall. Two participants said that the animals looked pretty healthy this year:

> *They were pretty healthy this year. We didn't see any sick animals. Even the seals [spotted seals] where healthy.* (Point Lay Hunter Observation August 2012)

> *Yeah everything seems healthy. I did get bearded seal while we were out whaling....It was really healthy.* (Point Lay Hunter Observation October 2012)

Three participants shared health related observations. While no participant expressed serious concerns about the health of the animals, the comments these participants provided are listed below:

> *There's seals with real black covered skin this time of year. They kind of taste like kerosene[2]. I don't know what it is… molting. We're able to tell which is a bad seal from a good one to catch.* (Point Lay Hunter Observation May 2012)

> *The biologists found parasites in the ears [of the beluga]. That was new. For the most part they were normal.* (Point Lay Hunter Observation July 2012)

> *We noticed that the caribou wasn't as fat as last year. We got about four caribou in August last year that was real fat, the one we got this time we was like "Aw man," it wasn't as fat as it should be for this time of year. It was healthy, just not as fat as we're used to.* (Point Lay Hunter Observation October 2012)

4.6.1.3.2 Distribution

Point Lay participants shared an assortment of observations related to the distribution of animals during the 2012 boating season. Unlike Wainwright, Point Lay participants did not report large numbers of species generally rare to the area this year. No unifying pattern emerged from the comments, though the comments do provide some insight into how weather, sea, and ice conditions affected subsistence activities throughout the year.

One participant said that he thought it was unusual that no polar bears came to the whaling camp while the community was butchering the harvested bowhead whale,

> *It was weird that whole time we were pulling up the whale, butchering it, we didn't see any polar bears. We saw tracks but they didn't go near the camp. I think somebody was saying Wainwright had already landed a couple of whales all the bears were up there toward Wainwright.* (Point Lay Hunter Observation May 2012)

Another individual discussed that the seals were farther out from shore than usual this year. In addition to staying far from shore because that's where the sea ice was, this participant suggested that the seals were far from shore because the water near to shore was murky. This participant suggested that the seals don't like swimming in murky water:

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[2]During traditional knowledge interviews in Barrow and Kotzebue, two interviewees identified that during the spring (April and May) male ringed seals have black faces and smell like kerosene or gasoline and that residents prefer to harvest female ringed seals during this time (SRB&A 2005; SRB&A 2010a).

> *They [the seals] were farther out this year because there was ice way out there. Because of the water being murky nearby we had to go way out just to go to the* ugruks*. They don't seem to like the murky water.* (Point Lay Hunter Observation August 2012)

The lack of sea ice near Point Lay was cited as a reason for the lack of walrus hauling out near the community in the summer. One person explained,

> *I noticed we didn't have any walruses this year. I was telling my dad, we're not going to get walrus; they're all going to head to the ice in Barrow. It would usually be this time of year that we would have them on the haul out, but they didn't come. It's a good thing that Barrow had all that ice.* (Point Lay Hunter Observation August 2012)

Participants noted however that walruses continued to haul out in large numbers on the barrier islands near Point Lay in the fall as they had in all three study years. Long term residents said that though this behavior was uncommon in the past, it is now becoming a new normal for the species. The participant who commented on this year's haul out said,

> *Walruses were back on the beach again, same place. Unusually the same numbers. It's not usual. I think so, but I think they said there's a lot of ice where they came from in their usual place. Maybe they're becoming accustomed to lounging around on the beach. It might be better scratching their skin on the beach than the ice. I don't know. Yeah their haul out's been in the same place.* (Point Lay Hunter Observation October 2012)

In contrast to the large walrus herds, one participant reported that the beluga herd was more dispersed and scattered in 2012 compared to previous years. This person stated that the community was never able to drive a big herd of beluga this year during their annual hunt. He said,

> *Well we never ran into a big herd [of belugas]. It was small this year and piece by piece. I forget how many for the first trip. There must've been 20 belugas. I left town after that. They got a few more, maybe 12 more, so maybe 34 for the whole season. They saw beluga but they were scattered. The belugas were coming in small bunches. We never drove a big herd.* (Point Lay Hunter Observation October 2012)

Two participants commented on the proximity of caribou to the village this year. One participant said that the caribou were much farther from the community than usual, while another participant said that they were much closer than usual. It may be that the participants' differing experiences simply reflect the different times of the year that they were attempting to harvest the caribou:

> *Surprisingly, we're getting more caribou at the river. We used to have to go all the way to Icy Cape. I was happy to get them closer instead of going way up north. Past two or three years we had to go all the way to Icy Cape to get caribou. This year they're a lot closer.* (Point Lay Hunter Observation August 2012)

> *The caribou, late in the season we usually have them within miles, now it's, we're having people say they're having to travel 20 miles to be able to see any.* (Point Lay Hunter Observation October 2012)

Only one participant reported seeing an unusual species in the area during the 2012 boating season. This participant reported seeing a type of duck he could not identify at Icy Cape:

> *Just the black ducks up north. I'm going to have to shoot one up there [Icy Cape]. Almost like puffins. My whole life I've been here I've never seen these ducks. The brants up there, they're the usual bird but these are starting to come up.* (Point Lay Hunter Observation October 2012)

4.6.1.3.3 Abundance

Most Point Lay participants said that bearded seals and caribou were more abundant in 2012 than in other recent years, though farther from the shore and thus more difficult to access. Two participants had the following to say about the abundance of bearded seals this year:

> *It seems like there's a lot of bearded seals this year because everybody's coming home with two or more – on those two days when it was just perfect.* (Point Lay Hunter Observation July 2012)

> *If anything there was more bearded seals and seals [ringed seal] this year. We just had to travel a little farther this year. Last year I was catching between two and five miles offshore. This year I was traveling 13 to 15 miles offshore.* (Point Lay Hunter Observation October 2012)

One participant said that he had seen only small bearded seals this year. He considered the lack of large bearded seals unusual, but was the only participant who reported this observation:

> *We had a hard time spotting big* ugruk*s. We only got two small* ugruk*s and a big one. We usually see big ones every year.* (Point Lay Hunter Observation July 2012)

Another participant offered a different view of the local bearded seal population. He said that the bearded seals were harder to find in 2012 than in 2011. This participant said,

> *I noticed this year there was less bearded seal than last year. It was harder to find them. We eat the meat, and make seal oil, and the skin for* umiaq *[skin boat]. We didn't really get that many, the ice was going out too fast.* (Point Lay Hunter Observation October 2012)

Two participants reported an overall increase in the number of caribou near the community this year. Participants suggested that the increase in the caribou population near the community might be due to the closure of a coal mine approximately 30 miles south of the community. The participants who commented on the local caribou population said,

> *I think we're starting to get our caribou; they're starting to come around more, especially in the summertime.* (Point Lay Hunter Observation October 2012)

> *It's hard to say numbers, it's hard to tell. We seen more caribou this year than last year.* (Point Lay Hunter Observation October 2012)

One participant reported what he called an unusually large number of brown bears near the community in 2012. This participant said,

> *I've seen an unusually large amount of brown bears this summer and there were brown bear tracks on the beach. Both lone adults and females with cubs on the beach. Just littered with bears everywhere. We took an Argo ride through the coast down south toward the mountains, and in one span about a mile we encountered seven brown bears. That kept us on edge. They seemed like they didn't care about each other.* (Point Lay Hunter Observation October 2012)

One participant said that he did not see any musk oxen in 2012. In his own words, this participant said, "What I didn't see this year was musk ox. We usually see them, not this year" (Point Lay Hunter Observation August 2012).

4.6.1.3.4 Behavior

Two participants said that the caribou migration was late this year. Participants prefer to harvest caribou early in the fall before they rut because the meat is more palatable, so a late migration can negatively

impact the caribou hunt. One participant suggested that climate change might be the reason for the late migration this year,

> *Probably a little fewer. Fewer caribou this summer and fall. They did finally reach our area, maybe last week, but they would usually be in our area by mid-October so we would get them before they rut. I think it's the climate change has a lot to do with our area and our hunting times.* (Point Lay Hunter Observation November 2012)

4.6.1.4 Project Suggestions and Feedback

All 2012 participants said they would continue to participate in the study if the study continued for additional years. One participant said that he was personally looking forward to the mapping data because it would be useful in discussions with oil companies over drilling. This participant said,

> *It would be a help for you guys to continue. I think the work you guys are doing and mapping we're doing can be used as an advantage to oil drilling, and DEW line cleaning up. It helps us. I would like it if you guys would continue doing this.* (Point Lay Hunter Observation October 2012)

When asked what the study team could do better in the future, one participant said that the study team needed to come earlier in the year to ensure that all bowhead whaling snowmachine tracks are recorded. Participants generally start breaking trail for spring whaling in March. This participant said,

> *Come in the middle of March and maybe first week of May because that's when we're breaking trail. It starts in March. We'll be scouting out on the ice for safe ice. That would give the whaling crews incentive to carry their GPSs all the time since you give out fuel vouchers for information.* (Point Lay Hunter Observation October 2012)

Another participant suggested that the study team hand out oil vouchers in addition to the gasoline vouchers:

> *Some people have issues getting oil for their boats. Maybe vouchers for the brand of oil that they use. [Name withheld] runs a two stroke, [name withheld] runs a two stroke, and oil's getting crazy. Might want to ask them if they'd be interested in that type of voucher.* (Point Lay Hunter Observation October 2012)

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CHAPTER 5: SUMMARY AND DISCUSSION

In 2009, SRB&A began the Chukchi Offshore Monitoring in Drilling Areas (COMIDA) study to establish updated subsistence baseline information in the Chukchi Sea area and monitor on an annual basis any significant changes in offshore subsistence harvest activities over time in the communities of Point Lay and Wainwright. SRB&A collected offshore subsistence GPS hunting tracks and related data during the course of the 2010, 2011, and 2012 open water seasons. Based on continuing discussion with knowledgeable community leaders and hunters and feedback received during community review meetings, SRB&A estimates that at least 75 to 80 percent of Wainwright and Point Lay offshore subsistence hunters participated. In total 27 Wainwright individuals and 30 Point Lay individuals registered in the study during the course of the three study years (2010, 2011, and 2012). Of these participants, 17 provided GPS track data in Point Lay, and 24 provided data in Wainwright. The information provided by Point Lay and Wainwright participants provide a baseline characterization of offshore subsistence uses in several key topics including where did the participants go, what did they target, and when did they go. Data that can be used to address these topics include baseline indicators such as offshore hunting tracks, resources targeted, and months of offshore activities. Furthermore, variation or trends in these subsistence baseline indicators can be put into context and explained through the environmental data (e.g., ice, wind, water conditions) and traditional knowledge provided by the participants.

5.1 Study Year Overview

5.1.1 2010

In general, Wainwright participants reported that 2010 was a challenging year for marine mammal harvests. Participants reported that the 2010 boating season was marked by a lack of ice and persistent high winds; both of these factors made boating more difficult and limited the amount of time participants were able to spend offshore, though few residents reported a significant decrease in harvest amounts over previous years. High winds and a lack of sea ice reduced the number of boating opportunities for the season. Participants who commented on the walrus hunt said that the ice went out too fast and too far, taking the walruses with them. Participants also said that unfavorable wind and ice conditions hampered their efforts to harvest bearded seals. When the study team asked Wainwright participants to compare weather conditions in 2010 to previous years, participants consistently reported that 2010 was a warm year characterized by unusually strong and persistent winds, mostly easterly winds that took the ice away from Wainwright.

In Point Lay, while some participants reported 2010 was a fairly typical year, others noted a continued trend of change related to changing weather and reduced harvest amounts. Similar to Wainwright, participants reported that the 2010 season was marked by higher winds than normal and a lack of sea ice. Several reported diminished harvests in bearded seal, walrus, and coastal caribou because of these changes. Most participants said that 2010 was comparable to other recent years, but added that the overall long term trend is toward less ice and diminished harvests. During the end-of-season reviews, several Point Lay residents commented on the persistent high winds throughout the boating season that pushed water out of Kasegaluk Lagoon and made it too shallow for boating.

5.1.2 2011

Wainwright participants reported that 2011 was a good year for marine mammal harvests. A strip of landfast ice remained in front of the community long after most of the ocean ice had melted or floated out to sea. The ice protected hunters from ocean swells and provided clean, safe platform for them to butcher harvested animals. Once the strip of landfast ice melted away, Wainwright hunters had no access to sea ice for the rest of the boating season because the main body of pack ice retreated from Wainwright during

the spring in both 2010 and 2011 and did not return until very late in the fall. As the season progressed, the lack of sea ice made it more difficult for hunters to harvest bearded seals and walruses. Overall, however, participants reported that marine mammals were plentiful this year (more so than in 2010) with some long term residents suggesting that 2011 marked a return to more normal harvest amounts. Many participants said that they were able to harvest the bearded seals and walrus they needed, though a few participants added that they were unable to harvest any walruses this year. Wainwright also harvested a fall bowhead whale in October which several participants cited as a significant component of the overall success of the season. The greater abundance of marine mammals reduced the amount of time hunters had to spend looking for them and allowed hunters to harvest them closer to shore. Nearly all Wainwright participants reported that 2011 was a warm and windy year. Participants also reported high winds and warm temperatures in 2010; however, the strong, persistent winds and constant warm temperatures that characterized the 2010 boating season were less intense during the 2011 boating season. Participants reported that intermittent periods of calm weather and cool temperatures allowed them greater access to offshore subsistence resources in 2011.

Point Lay participants reported that 2011 was a good year for marine mammal and coastal caribou harvests. Point Lay whalers harvested a bowhead whale in the spring. Most participants reported that they were able to harvest the walruses and bearded seals they needed. A few participants reported seeing sick seals along the coast, but healthy seals were abundant enough that participants were able to harvest what they needed for the year. Caribou returned to the coast in abundant numbers, and almost every participant who wanted caribou was able to harvest some by the end of the season. Most Point Lay participants reported that their harvest amounts in 2011 were the highest they had been for several years. Some long term residents suggested that 2011 marked a return to harvest conditions not seen for more than a decade. Participants stated that the region has undergone significant warming in recent years compared to earlier years. Participants consistently reported that break-up is occurring earlier, freeze-up is occurring later, and sea ice is thinner and is less anchored to the coast than in past years. The shift in the timing of the seasons has caused Point Lay residents to alter the timing of their subsistence activities. Participants continued to note the shallow waters that persisted in Kasegaluk Lagoon.

5.1.3 2012

The consensus among Wainwright participants was that 2012 was the most productive of the three study years. Wainwright successfully landed four bowhead whales in the spring. Most participants said that the presence of sea ice into the summer allowed them to harvest seals, bearded seals, and walruses with greater ease in 2012 than in 2010 or 2011. Favorable offshore boating conditions ended in August. High winds and persistent rain began shortly after the sea ice retreated in August and continued for the duration of the open water season. Wainwright chose not to go fall whaling in 2012 in part due to unsafe boating conditions, but also because of the success of the spring whaling season and the fact that the community had only a single bowhead strike remaining for the fall. All participants who shared their observations of the 2012 season said that harvest amounts were the same or higher in 2012 than in 2010 or 2011. Participants cited the presence of sea ice for several extra weeks in the spring as the most likely reason for the increase in the number of animals harvested in 2012. Wainwright participants characterized the 2012 boating season as warm, wet, and windy. As in 2010 and 2011, participants reported above average temperatures in 2012. Although the sea ice lingered for a few extra weeks, the ocean did not begin to freeze until October. Wainwright participants encountered sea ice during offshore boating trips until the first week of August. This was different from conditions in 2010 and to a lesser extent in 2011 when the ice retreated from the shore over a month earlier in the year than in 2012. The presence of sea ice for so many extra weeks in the summer made it easier for locals to access and harvest marine mammals.

The community harvested a bowhead whale in the spring of 2012, but lack of sea ice and low wildlife numbers made it difficult for some participants to harvest bearded seals and walruses as the season progressed. Reported harvest amounts for bearded seal, however, were higher in 2012 than 2010 or 2011.

The community harvested fewer belugas in 2012 as in 2010 or 2011. Participants said that caribou and salmon were more abundant than usual and reported harvest amounts for both species were higher in 2012 than in previous years. Point Lay's 2012 boating season was warm, wet, and windy, much as it was in Wainwright. Overall, weather conditions were similar to the last two seasons. The one notable exception was the fact that the sea ice lingered a bit longer in 2012 than it did in 2010 or 2011. The most unique feature of the season was the direction of the prevailing wind. Winds near Point Lay are usually out of the northeast. In 2012, however, southern winds were more frequent. The south winds kept the lagoon shallow and possibly contributed to the warm conditions Point Lay experienced for much of the summer. Other notable features of the season include persistent precipitation in August and September followed by a mild October and a late freeze-up.

5.2 Offshore Hunting Areas 2010 to 2012

Map 101 displays the combined results of Wainwright's 2010, 2011, and 2012 offshore subsistence hunting tracks and includes data from March-October 2010, April-October 2011, and April-September 2012. Wainwright's offshore hunting tracks during the three study years extended from as far south as Icy Cape north to Peard Bay. The farthest extent of hunting tracks ranged from approximately 26 to 32 miles offshore and up to 40 miles from Wainwright. The tracks located farthest offshore were associated with bowhead spring whaling (2010), bowhead fall whaling (2011), and walrus hunting (2012). The greatest densities of Wainwright hunting tracks are located in a nearly continuous area up to 10 miles offshore from Pingorarok Pass to Point Franklin.

Map 102 shows the combined results of Point Lay's 2010, 2011, and 2012 offshore subsistence hunting tracks and includes data from April-September 2010, May-October 2011, and April-October 2012. The majority of Point Lay's hunting tracks are located north from Omalik Lagoon to Icy Cape, although a few tracks were also recorded as far south as Point Hope and north as far as Wainwright. A large number of Point Lay hunting tracks are concentrated in Kasegaluk Lagoon. The farthest extent of offshore subsistence activity during the three study years ranged between 10 and 22 miles offshore with the farthest offshore track occurring west of Point Lay. In each study year, the tracks located farthest offshore were associated with bearded seal hunting (2010) and bowhead spring whaling (2011 and 2012).

Offshore hunting tracks for both communities combined are shown on Map 103. In general, the two communities' offshore hunting areas do not overlap except for a small area near Icy Cape. Point Lay's hunting tracks extend greater distances north and south of the community than Wainwright's hunting tracks. Wainwright's hunting tracks, however, extend farther offshore than Point Lay's.

5.3 Offshore Target Resources 2010 to 2012

Three marine mammal resources characterized the focus of offshore harvest activities for both communities based on reported purpose of all documented trips from 2010 to 2012. In Wainwright, these three were bearded seal, bowhead, and walrus (Figure 19). In Point Lay, bearded seal, bowhead, and beluga were the three resources that were the focus of residents' offshore marine mammal harvests activities (Figure 20).

For both communities, bearded seal were the most commonly targeted offshore subsistence resource. Both communities primarily targeted these resources during the months of June and July. Point Lay residents reported several harvests earlier in the year in April and May as well. In total, 42 to 52 percent of Wainwright participants offshore hunting trips were for bearded seal, and Point Lay participants reported a slightly lower percentage between 21 and 39 percent. Residents of Point Lay and Wainwright reported some of the farthest offshore distances traveled during the three study years were in search of bearded seal. Point Lay participants traveled up to 16 miles offshore in search of bearded seal in 2012 and in Wainwright, project participants traveled up to 26 miles offshore. Wainwright residents reported that 2010 was a difficult year for hunters due to persistent high winds and low wildlife abundance, and these factors may have contributed to the absence of late summer (e.g., August and September) sealing in 2010.

Map 101: Hunting Tracks, Wainwright 2010-2012

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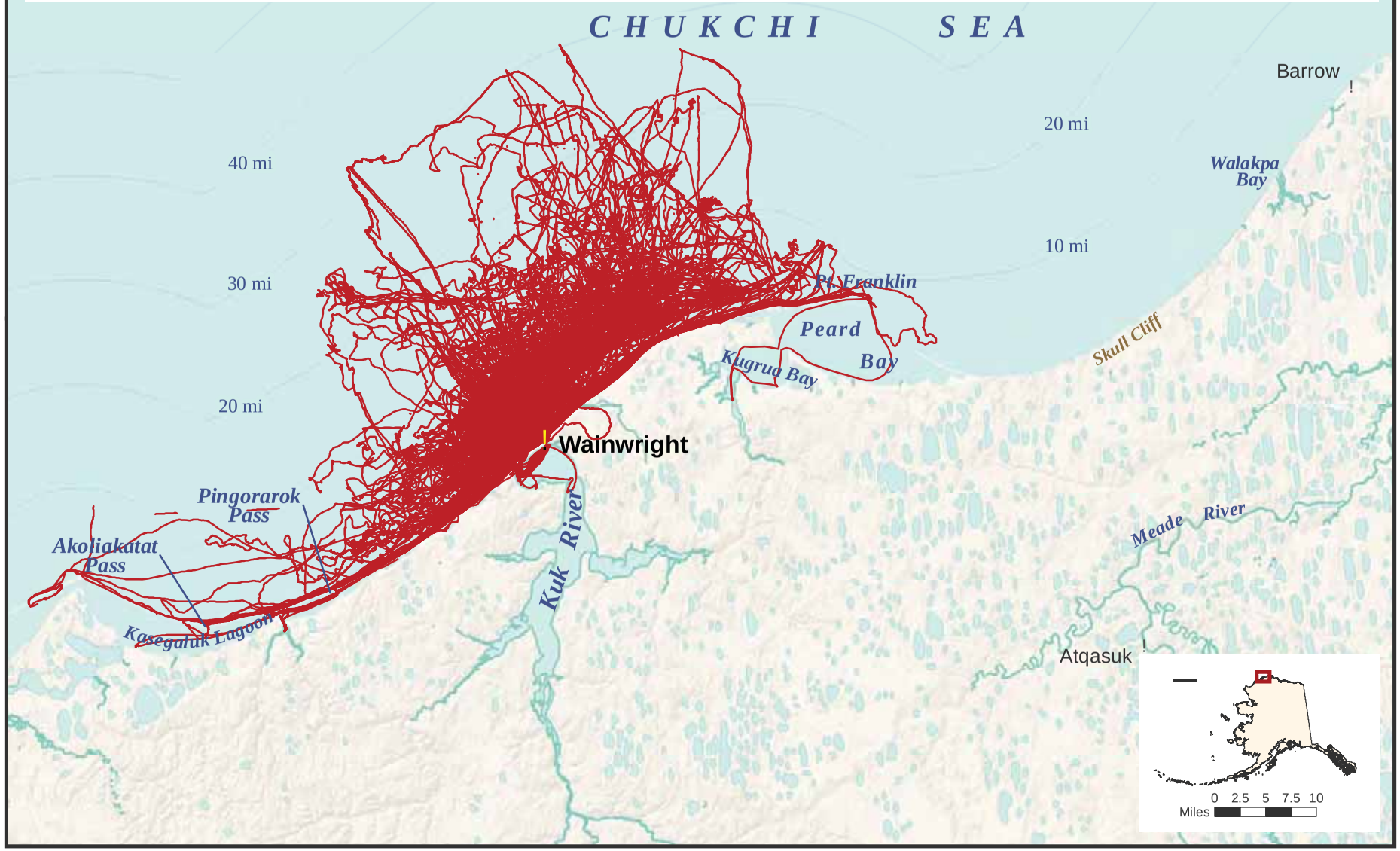
! study community
! other community

April-September 2012 hunting tracks (129 boat tracks representing 137 hunting trips, 16 respondents)

April-October 2011 hunting tracks (121 boat tracks representing 132 hunting trips, 22 respondents)

March-July and September-October 2010 hunting tracks (111 boat tracks representing 120 hunting trips, 16 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Wainwright harvesters. SRB&A coordinated with local organizations and residents to identify appropriate study participants.



Map 102: Hunting Tracks, Point Lay 2010-2012

Stephen R. Braund & Associates
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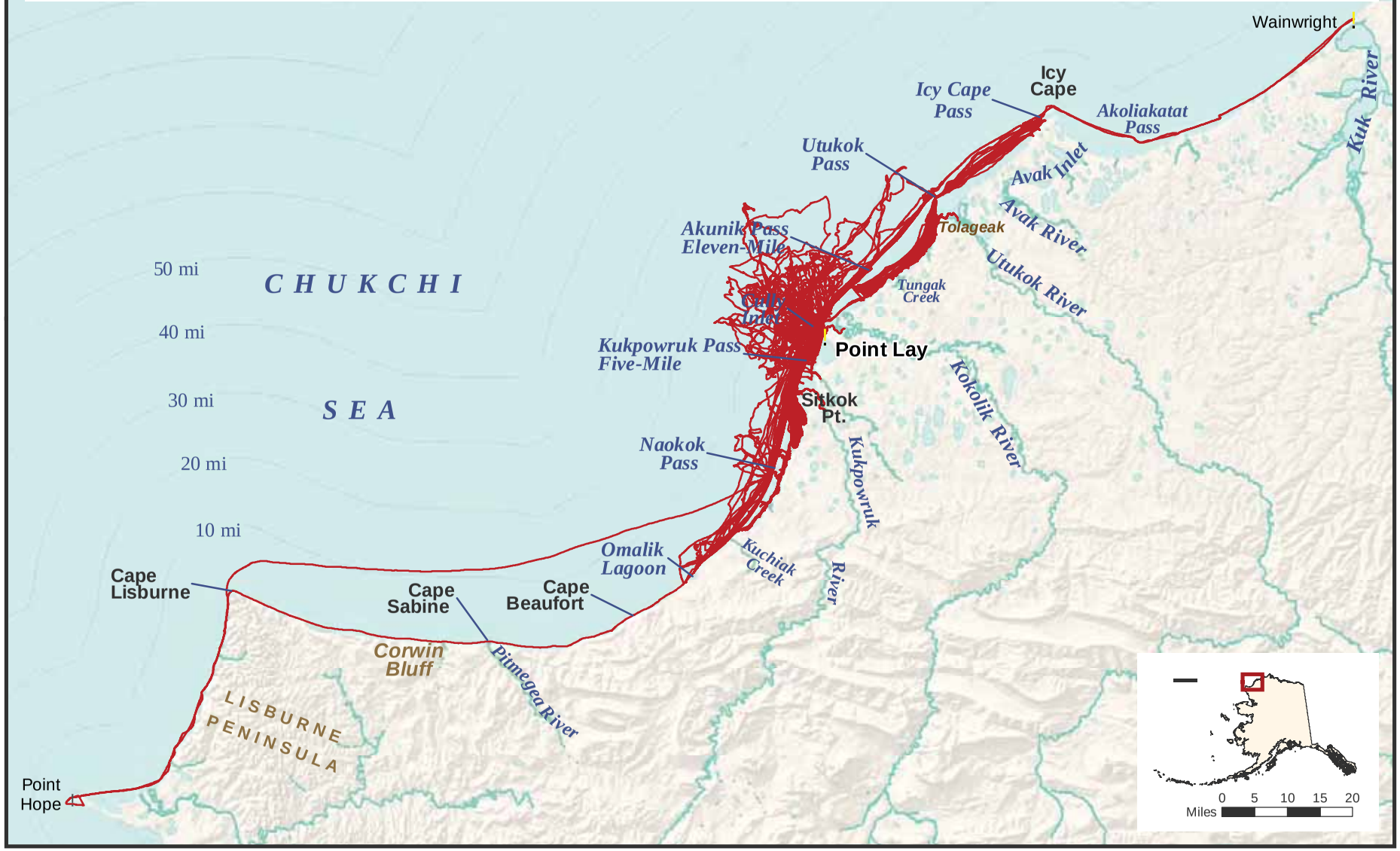
! study community
! other community

April-September 2010 hunting tracks (52 boat tracks representing 53 hunting trips, 10 respondents)

May-October 2011 hunting tracks (62 boat tracks representing 70 hunting trips, 13 respondents)

April-October 2012 hunting tracks (112 boat tracks representing 117 hunting trips, 12 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



Map 103: Hunting Tracks, Wainwright and Point Lay 2010-2012

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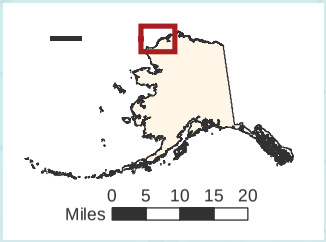
! study community
! other community

Wainwright hunting tracks (361 boat tracks representing 389 hunting trips, 24 respondents)
Point Lay hunting tracks (226 boat tracks representing 240 hunting trips, 17 respondents)

Under Contract to the U.S. Departement of the Interior, Bureau of Ocean Energy Management, Stephen R. Braund and Associates (SRB&A) collected GPS data from Point Lay harvesters. SRB&A coordinated with the Native Village of Point Lay and local residents to identify appropriate study participants.



CHUKCHI SEA

50 mi
40 mi
30 mi
20 mi
10 mi

Akoliakatat Pass
Wainwright
Icy Cape
Icy Cape Pass
Kuk River
Utukok Pass
Avak Inlet
Akunik Pass
Eleven-Mile
Tolageak
Avak River
Utukok River
Tungak Creek
Cully Inlet
Point Lay
Kukpowruk Pass
Five-Mile
Sitkok Pt.
Kokolik River
Naokok Pass
Kukpowruk River
return travel route to village
Omalik Lagoon
Kuchiak Creek
Cape Lisburne
Cape Sabine
Cape Beaufort
Corwin Bluff
Pitmegea River
LISBURNE PENINSULA
Point Hope
Ipewik River

Figure 19: Wainwright Summary 2010 – 2012 Study Years

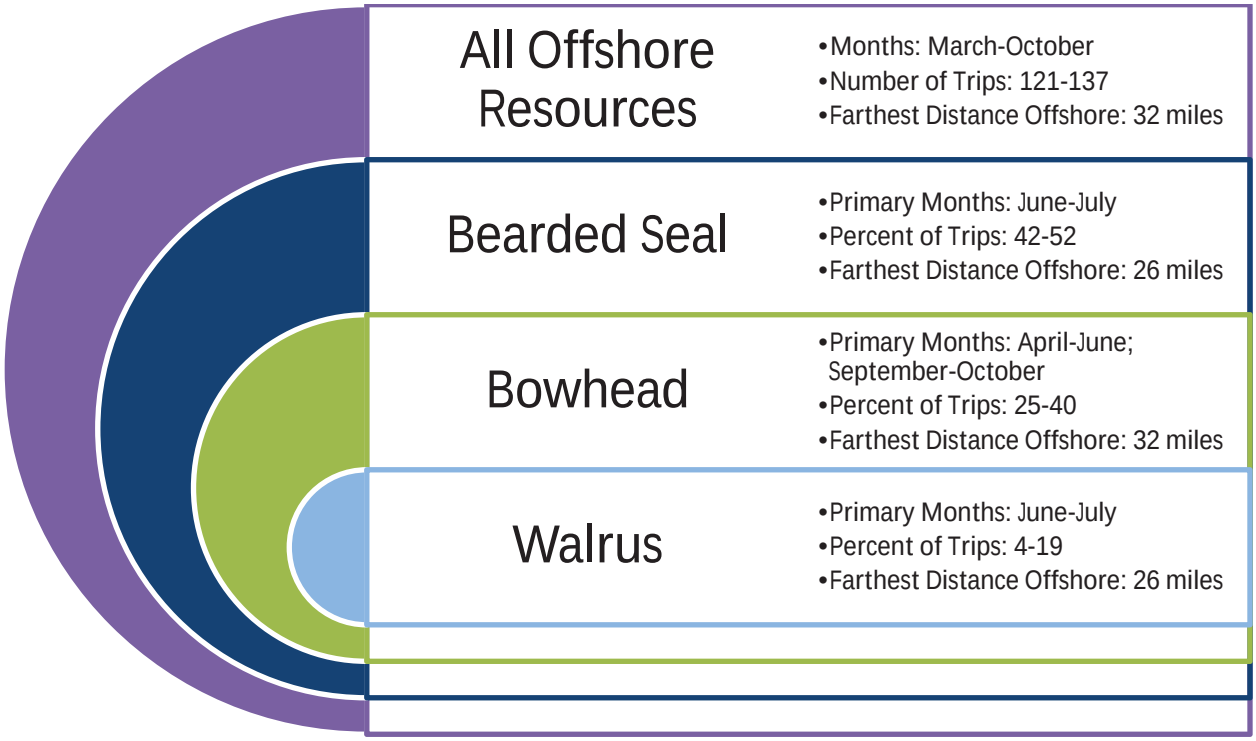
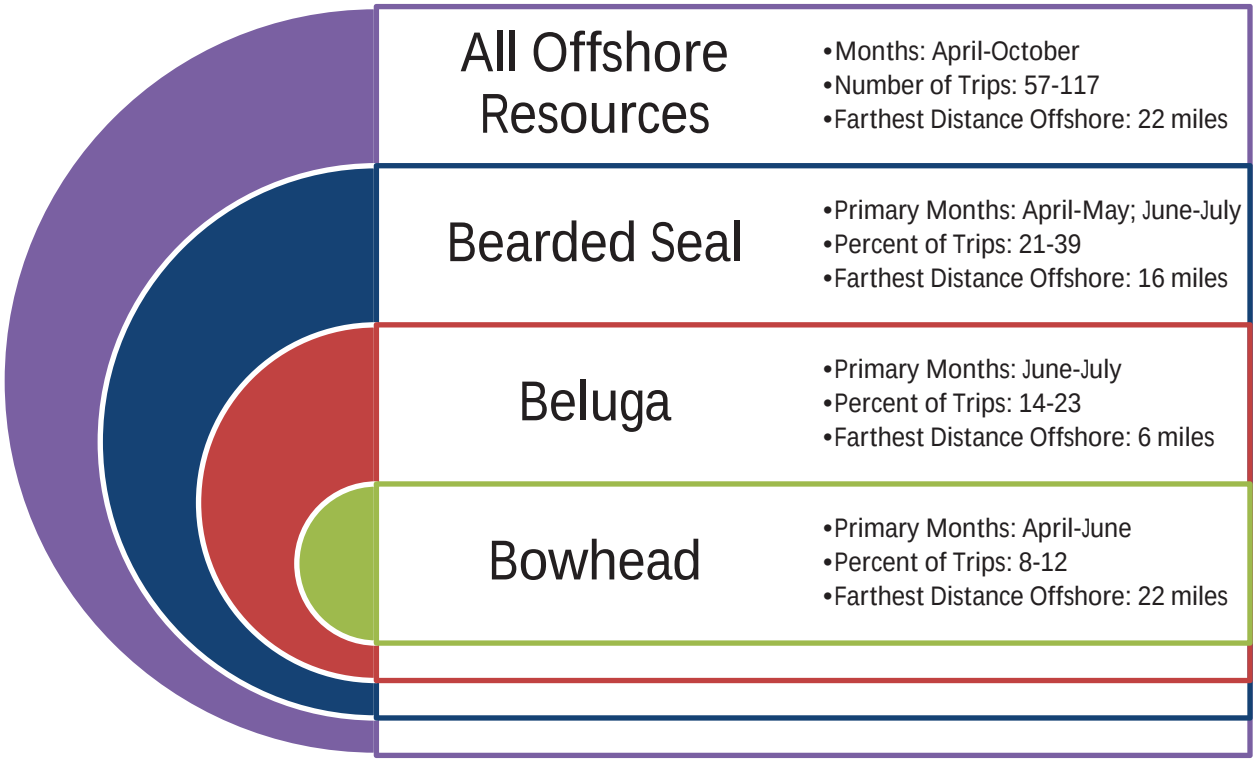


Figure 20: Point Lay Summary 2010 – 2012 Study Years



In Wainwright, bowhead whales were the second most targeted offshore resource with residents engaged in both spring and fall whaling. Spring whaling occurred between April and June with the majority of activity in May. Fall whaling occurred in September and October with the majority of activity in October. Bowhead whaling activities were the third most targeted marine mammal in Point Lay in part due to the fact that residents generally only hunt for whales in the spring during April and May. Bowhead whaling activities accounted for 25 to 40 percent of Wainwright's offshore hunting and 14 to 23 percent of Point Lay's offshore hunting activity trips. In all study years for both communities, bowhead whaling activities were the farthest offshore tracks reported by study participants except for Wainwright's walrus hunting in 2012 and Point Lay's bearded seal hunting in 2010. In Wainwright, these offshore distances occurred during spring whaling in 2010 (approximately 30 miles offshore) and fall whaling in 2011 (approximately 32 miles offshore). In Point Lay, spring whaling occurred as far as 22 miles offshore. Spring whaling locations are highly dependent on the ice conditions and can change greatly from year to year. For example, Wainwright residents did not report having to use the Point Franklin or Icy Cape areas for spring bowhead whaling although they indicated this area has been used in the past for spring whaling.

Walrus in Wainwright and beluga in Point Lay were the final resources that complete the top three marine mammals focused on by community residents. Wainwright walrus hunting activity occurred from June to September with the majority of effort occurring in June and July. June and July were also the primary months for Point Lay's beluga harvest activities. Over the three study years, walrus comprised between four and 19 percent of the total Wainwright trips; belugas were targeted on 14 to 23 percent of total Point Lay trips. In contrast to the poor conditions for Wainwright's walrus hunting in 2010, the 2011 and 2012 study years were better in terms of the community's walrus hunting activities. This is evidenced by a notable increase in walrus hunting tracks (five tracks in 2010 to 25 and 24 tracks in 2011 and 2012) and participants (five participants in 2010 and to 12 individuals in 2011 and in 2012) who reported targeting walrus. Wainwright participants traveled up to 26 miles offshore in search of walrus, the farthest distance offshore for Wainwright reported for 2012. Point Lay beluga hunting activities occurred relatively close to shore with the farthest track offshore documented at approximately six miles offshore.

The remainder of offshore resources harvested by Wainwright and Point Lay include several species of seal, fish, waterfowl, and eggs all of which were targeted less frequently and closer to shore than the resources discussed above. Caribou were also targeted by both communities, particularly Point Lay hunters, who utilized the offshore environment to access caribou hunting areas along the coastline. In fact, Point Lay residents reported the greatest percent of their offshore hunting activities were in search of caribou (31 to 39 percent). Nearly all tracks were within a mile of shore or within local lagoons, particularly Kasegaluk Lagoon. July and August were the primary months of Point Lay's caribou hunting activity along the coastline with additional trips reported in June, September, and October.

5.4 Month of Offshore Hunting Activities 2010 to 2012

In general, both communities took more offshore hunting trips in May than in April; May trips accounted for 10-27 percent of total trips and April trips accounted for two to 12 percent in Wainwright. In Point Lay, May accounted for two to 11 percent and April trips ranged between zero to 12 percent. In both communities, April and May offshore hunting activities are focused on the pursuit of bowhead whales in offshore leads. Other resources however may also be taken during these months. In Wainwright and in Point Lay, participants will hunt for waterfowl (primarily eiders) and seals during the spring months. In 2010, Wainwright participants also reported early spring hunting in March for seals and waterfowl. The farthest offshore hunting activities were documented at approximately 12 to 13 miles in April for Wainwright and Point Lay. In May, these offshore distances increased to 22 miles for Point Lay and 30 miles in Wainwright.

Point Lay and Wainwright residents shifted their focus in June and July to seal hunting, particularly for bearded seal. Beluga hunting (particularly in Point Lay) and walrus hunting in Wainwright were also

important hunting activities during June and July. Other non-marine mammal resources that were sought during the peak summer months included fish, waterfowl, eggs, and caribou. Except for June of 2010 (33 percent of trips) in Point Lay and June of 2012 (36 percent of trips) in Wainwright, July had the highest percentage (26 to 45 percent of trips in both communities) of offshore hunting trips during all three study years. In June and July, Wainwright participants reported offshore hunting activities extending from 26 to 22 miles respectively. Point Lay participants reported shorter offshore distances in June and July compared to Wainwright at 16 and eight miles respectively.

The frequency of offshore subsistence activities declined in August and September for both communities, although August was more active in Point Lay than in Wainwright. For Wainwright, August trips accounted for zero to five percent of trips compared to the higher 15-21 percent of trips in Point Lay. September trips ranged from two to five percent in Wainwright and from five to seven percent in Point Lay. In Point Lay, offshore activities during the fall months were focused on caribou and berry harvests, although some sealing also occurs. Wainwright residents engaged in seal, walrus, and fishing activities during these months. Wainwright also reported bowhead whaling trips in September of 2011. In general, offshore hunting activities were also located closer to shore in August and September. Excluding the September 2011 bowhead whale hunting trips (28 miles offshore), Wainwright participants traveled no farther than 12 miles offshore in August and five miles offshore in September in the three study years. Point Lay participants traveled no farther than approximately three miles offshore in either August or September during the three study years.

October activity increased in Wainwright for bowhead whaling (zero to 19 percent of trips). The community chose not to participate in during October of 2012 due to weather conditions and a productive spring bowhead harvest, which explains the zero percent of trips in 2012. Because Point Lay does not typically try to harvest bowhead in the fall, the community took very few offshore hunting trips during October (between zero and three percent). Those trips that did occur in October for Point Lay were for caribou and walrus. Wainwright traveled up to 32 miles offshore during the October bowhead hunting trips. Point Lay residents only traveled up to three miles offshore during their October hunting activities.

5.5 Identifying Causes of Variation in Offshore Subsistence Activities

Over the course of the three study years, the study team, with the assistance of the traditional knowledge shared by project participants, identified a number of factors that influence and cause variation in offshore subsistence activities. These variables include several environmental factors in addition to human influences. Understanding how these environmental and human factors can influence offshore subsistence hunting activities is important in any future studies which may look at the influences of offshore development activity on local communities' subsistence practices. These variables discussed in the following section include ice, wind, aircraft and vessel traffic, and other factors such as resource health or equipment failures. While there are additional reasons that could cause variation in a community's offshore subsistence hunting activities, the examples discussed below were ones that were clearly identified and experienced by participants during the three study years.

5.5.1 Ice

Ice conditions were one of the most frequently cited causes that influenced Wainwright and Point Lay residents' ability to hunt. Sea ice in the form of stable shorefast ice provides a secure platform for spring whaling camps and leads provide access zones for bowheads. In the later summer, sea ice is of great importance for sealing and walrus hunting as floating ice pans provide harvest/butchering platforms and the ice makes it easier to spot, harvest, and butcher these animals. High wind and warm temperatures were reported as the primary reasons for the absence of sea ice and without sea ice hunters offshore activity diminished.

The presence of leads in the ice, as well as pressure ridges that can block hunters access to the lead, are important factors in determining where, when, and how frequently local residents can hunt for bowhead

whales in the spring. Pressure ridges at the open lead can also present difficulties in the butchering of the whale as they limit the number of areas where whales can be easily hauled onto the ice for butchering or require residents to chop out an area of the pressure ridge in order to haul the whale up on the ice.

Participants from both communities consistently mentioned the importance of ice presence for bearded seal and walrus hunting in the summer and the effects that the loss of sea ice early in the summer season can have on the community. Sea ice provides important habitat for walrus and seals that allow them to haul out and rest while at the same time providing easy access to nearby feeding areas. While walrus and bearded seal can still be found when little or no ice is present near the community, their numbers are less than when ice is present.

The absence of sea ice also poses several difficulties to local hunters that influence their hunting activity patterns. The difficulties that local harvesters must face due to the lack of sea ice include more dangerous hunting conditions, increased difficulty in spotting and harvesting marine mammals, and less than ideal butchering conditions. When no ice is present, high winds can create high wave conditions that increase the danger of boats capsizing or being swamped (see discussion in Section 4.5.2 Wind). As opposed to being on the ice, bearded seal and walrus in the water present a smaller profile to shoot at, and when they are shot must be quickly retrieved in order to avoid the animal from sinking and being lost. When found on the ice, these marine mammals providing a larger shooting profile, have reduced chance of being lost into the water, and are located on a clean and stable butchering platform. When residents harvest a marine mammal in the water the animal has to be hauled to and butchered on shore, which is a more sandy and less clean area compared to the ice platform.

All of these reasons can lead to variation in offshore subsistence activities from year to year including where participants go, how often they go, when they go, and how much they harvest. Walrus hunting in Wainwright over the three study years presents one of the best examples of variation in offshore hunting activities due to the lack of sea ice in 2010 and the improved sea ice conditions in 2011 and 2012 as evidenced by four percent of trips in 2010 and 19 and 16 percent of trips in 2011 and 2012.

Even when ice is present, warmer temperatures can create rotten sea ice, or ice that is less stable that poses its own set of difficulties for local hunters. One of the first difficulties created by rotten ice is that it can break off and jam together with other ice sections that can trap hunters if they travel too far into the broken, rotten ice. Additionally, rotten ice provides more avenues for seals and walrus to escape into the water and creates more difficult hunting conditions.

Several individuals from both communities made the observations that changing ice conditions in the form of earlier thaw and later freeze-up have provided the community with additional opportunities to conduct offshore subsistence activities. In Wainwright, later freeze-up allows for extended fall bowhead whaling opportunities. In Point Lay, it was noted that early thaw is beneficial to Point Lay hunters because in the past when there has been a late break-up of the river and lagoon near Point Lay the community has been unable to access the ocean and by the time the river and lagoon ice had melted the ocean ice had already receded. Because the majority of marine mammals, particularly seals, follow the ocean ice and use the ice for haul-outs, a late break-up that prohibits residents from accessing the ocean can cause them to miss the window of opportunity when seals are present in greatest numbers near the community.

5.5.2 Wind

The intensity and direction of wind are factors that influence Wainwright and Point Lay hunters' offshore subsistence activities and are other cause for variation in community residents' hunting activities from year to year. The direction of the wind can blow ice towards or away from the community and in Point Lay can create shallow water conditions in Kasegaluk Lagoon. Strong winds can also create high surf conditions (especially when no ice is present to dampen the wave surge) that are dangerous to local hunters.

In general both communities indicated that northeast and easterly winds negatively affect offshore subsistence activities. Easterly winds push the ice pack farther out to sea and out of reach of residents' primary offshore hunting areas. In Point Lay, these same winds also blow water out of the lagoons that many residents use for travel and access to the ocean. If the winds are persistent and strong enough they create shallow water conditions in the lagoons, and residents cannot easily travel to the ocean or within the lagoon. When hunting migratory animals such as bearded seal and walrus, persistent east winds can cause local residents to miss crucial time windows in which these resources are present near the community. Point Lay residents also noted nearshore activities such as gillnetting for salmon and herring/smelt in the lagoon and scouting for beluga can also be negatively affected by shallow waters. In contrast, southwest or westerly winds bring ice closer to the communities, and in Point Lay winds also push water into the lagoons that allow for easier travel and access. During the spring whaling season, persistent west winds can create pressure ridges that make whaling more difficult (see discussion in Section 4.5.1 Ice).

When no ice is present, strong winds can created dangerous wave conditions that limit the ability of residents to go offshore and hunt for subsistence resources. Residents, particularly those who own smaller boats, run the risk of capsizing or swamping their boats when they encounter large waves and high winds. High waves also make it difficult for residents to launch their boats from shore. In general, many residents will not venture offshore during these strong wind conditions. These strong winds and/or easterly winds can lead to variation in offshore subsistence activities from year to year including where participants go, how often they go, when they go, and how much they harvest.

5.5.3 Aircraft and Vessel Traffic

In addition to environmental factors such as wind and ice, the study team noted the influence of aircraft and vessel activity on residents' offshore subsistence activities. While participants did not report high levels of traffic during the study years, there were several instances of aircraft and vessel traffic that provide insight into the influence that traffic can have on offshore subsistence patterns. Examples of these effects from traffic included disruption of wildlife and hunter avoidance of industry activities.

In some cases offshore vessels were noted on the horizon with no impacts on subsistence activities reported. Other hunters, however, noted that offshore vessel traffic resulted in disturbance of wildlife and hunter avoidance. For example, one Wainwright individual reported the U.S. Coast Guard ship had scared walrus into the water and away from the hunters. Another person reported an uncomfortable hunting environment created by the close proximity of the U.S. Coast Guard ship near their ringed seal hunting area. In Point Lay, barge traffic was identified by one community resident as a contributing factor to poor beluga harvest in 2012.

While there were few instances of vessel traffic disturbing offshore subsistence activities, residents described more frequent disturbances to their hunting from aircraft traffic including planes and helicopters. In several instances, residents reported observing aircraft in the vicinity of their hunting areas but did not report any impact. Similar to vessel traffic however, others believed the aircraft deflected resources by flying to low. These examples included deflection of caribou from the coast and disturbance of beluga. One individual reported be bothered by the nearby presence of the aircraft even though no disturbances were noted to belugas.

5.5.4 Other

Individuals from both communities identified several other influences that affected their offshore subsistence hunting activities and are additional factors that should be considered when identifying variations in community hunting activities. These additional influences included unhealthy resources and equipment failures, lack of money, and other personal reasons.

The field researcher observed several occurrences in which mechanical problems resulted in active harvesters not being able to participate in offshore subsistence activities. In some cases, this resulted in the individual missing a particular hunt; in other instances, participants identified missing larger time periods of the offshore hunting season due to extended mechanical problems or lack of funds to replace broken parts. Work or family commitments are also factors that can influence a community's offshore subsistence hunting patterns for a particular year, especially when that individual is an active harvester or whaling captain.

While few observations were made regarding unhealthy animals, participants reported avoiding harvesting animals that appeared unhealthy. Examples of this included avoiding seals that appeared to be unhealthy or have lesions on them due to the sickness that was observed during the 2011 season. Avoidance of unhealthy resources has a potential direct implication on community wide harvests levels and may also result in residents taking additional trips to harvest other healthy resources to make up for the lack of harvest.

5.6 Determining Significant Variation and Attributing Variation to Oil and Gas Activities

Two research topics BOEM sought to collect information on were as follows:

1. Determine whether subsistence hunting in the Chukchi Sea displays significant variation over time
2. Determine whether variation can be attributed to offshore oil and gas industrial activities

The study team considered these two research topics in light of the three study year efforts in Point Lay and Wainwright.

As the previous sections in Chapter 4 have discussed, both Wainwright's and Point Lay's subsistence harvest activities displayed variation over the three study years. Causes for this variation included ice conditions, wind conditions, aircraft and vessel traffic, and other reasons such as the health of resources or equipment failures. Determining whether or not these two communities' offshore subsistence activities displayed **significant** variation is a more difficult topic to address. Based on discussions with community residents and the study teams own knowledge of subsistence activities in Alaska, three years of data is valuable in beginning to understand variation but in and of itself does not capture the full variation of a community's harvest patterns. Certain statistical tests such as Chi-Square or Analysis of Variance are two methods of examining whether variation in data is significant. In nearly all cases in which the study team ran the Chi-Square or Analysis of Variance tests, there was no significant variation in the data using a significance threshold of 0.05, which the study team chose to account for year-to-year variation due to the factors such as ice and wind discussed above. These tests are only two examples of potential methods for ascertaining significant variation and do not address other topics such as significant variation in distance traveled or harvest amounts.

Determining whether variation in offshore subsistence activities can be attributed to oil and gas activities is a question that cannot be answered with the current data set as oil and gas activities were relatively limited in the Chukchi Sea during the study years and associated impacts were limited to one reference of disturbance of caribou from Shell helicopters. However, the information collected in this study provides a valuable baseline that can be used to compare with future data collection efforts that should occur if oil and gas development activities continue in the Chukchi Sea. Specifically, this data set for the 2010 to 2012 study years, which was collected pre-oil and gas development in the Chukchi Sea, could be compared to similar data collected after oil and gas development activities occur in the Chukchi Sea. These two data sets could then address whether variation in offshore subsistence activities can be attributed to oil and gas activities.

CHAPTER 6: CONCLUSIONS

Three years of baseline offshore subsistence activities were documented in Point Lay and Wainwright in 2010, 2011, and 2012. The study was well received by the local community, and the community wished for the study to continue beyond the three years of data collection. While not all active offshore hunters participated, the study team believes that at least 75 to 80 percent of Wainwright and Point Lay offshore subsistence hunters participated. This high rate of participation and community engagement was a key to the success of this study.

In regards to the study hypotheses, the data collected in this study show that there is variation in offshore subsistence hunting activities due to ice conditions, wind conditions, aircraft and vessel traffic, and other reasons such as the health of resources or equipment failures. However, based on comments made during community reviews and by study participants, the three years of data did not capture the full extent of variation among all offshore subsistence activities to adequately characterize the offshore areas and hunting activities of either study community or ascertain how significant the physical variations in hunting tracks are from year to year. Whether variation in offshore subsistence hunting patterns is related to offshore oil and gas activities could not be answered with the current data set as oil and gas activities were relatively limited in the Chukchi Sea during the study years or were too far offshore to cause hunters to report industry interactions during their subsistence activities for the three study years.

Two new hypotheses for possible consideration in future studies could include a comparison of variability in hunting activities between inland and offshore activities. These hypotheses could be stated as follows:

1. *Inland hunting activities display less variation and are more predictable from year to year compared to offshore hunting activities.*
2. *The farther the ice retreats offshore the farther subsistence hunters will travel offshore to harvest key marine mammals up to a maximum of 60 miles offshore.*

The purpose of the first hypothesis, if proven true, would be to show that offshore hunting activities are more susceptible to outside influences such as weather, climate change, and resource changes versus inland activities which the hypothesis assumes would show less variation in spite of influences such as weather, climate change, and resource change. Topics of variation that could be addressed may include spatial (areas searched), temporal (duration and frequency), financial (costs), and social characteristics (number of participants attempting to harvest) that define subsistence activities. In addition to providing a baseline of offshore and inland hunting activities that could be affected by potential oil and gas development in the Chukchi Sea, the results of such a future study would be beneficial in providing a greater understanding of whether offshore or inland subsistence activities and associated characteristics are more susceptible to outside influences and thus better inform future planning and mitigation strategies associated with resource development in an area that has seen little to no offshore development to date.

The second hypothesis, if proven true, would show that offshore travel limitations are due to safety and financial concerns. Hunters will limit the extent of their offshore subsistence activities when safety or financial factors override their need for subsistence resources. Based on previous research on the North Slope, the hypothesis assumes that the maximum distance hunters will travel is no more than 60 miles offshore.

Finally, the study team learned several valuable lessons from this study that may prove useful to researchers conducting similar studies in the future. These lessons include:

- **Lesson 1 - Greater Researcher Presence:** A similar project with such a large scope (i.e., collection of subsistence hunting information for all offshore resources) should have a greater researcher presence with more trips or trips of longer duration than what the study team took to each community during each of the three study years. The study team originally planned to hire a local research assistant in each community with a continual presence in the community. However, this strategy was unsuccessful in both communities despite a prolonged effort to retain a local research assistant during the study team's absence. A greater researcher presence is especially important at the start of a new study. Field researchers should maintain a presence in the community until participants become comfortable with the requirements of the study. Greater researcher presence will result in fewer hunting trips and associated data not being recorded and will allow the researcher to become more familiar with the overall subsistence patterns of the community in order to provide greater context to the data that is collected during the study year.
- **Lesson 2 – More Effort in Preparing for Study:** Study preparations within a potential study community should begin at least three months in advance of fieldwork. This three-month time window should be applied to each study year and allows for supplies to be organized, new participants to be trained how to use equipment, new supplies handed out to replace broken or lost items, and time given for participants to re-engage in the study.
- **Lesson 3 – New GPS Technology:** New passive GPS technologies exist that do not require any action from the user except intermittent maintenance. For example, these GPS devices will passively record data for weeks provided there is an adequate battery supply. Participants could simply keep these devices in their boats or on their snowmachines at all times. These devices are small and do not have screens and participants would not be able to log waypoints with them, but these devices would ensure that fewer trips are missed during data collection. This passive GPS device could be used in conjunction with handheld GPS devices. Participants could use the handheld devices for navigation and to record waypoints and would be a backup in case the passive GPS fails.
- **Lesson 4 – Weather Stations:** If available, it is more cost efficient and more accurate to request weather data from existing weather stations such as National Oceanic and Atmospheric Administration stations than to purchase less reliable or accurate weather stations, especially under severe Arctic conditions.
- **Lesson 5 – Traditional Knowledge Discussions:** Community elders and knowledgeable harvesters should be asked to participate in separate traditional knowledge discussions that discuss conditions over the past 20 to 30 years to provide context for the more limited study years of data collection. These discussions should occur after the preliminary results of the study have been drafted so that the conclusions can be placed in a larger context.

LITERATURE CITED

Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs.
n.d. Community Database Online: Point Lay.
http://www.commerce.state.ak.us/dca/commdb/CF_BLOCK.cfm?Comm_Boro_Name=Point+Lay&Data_Type=generalOverview&submit2=Get+Data. Accessed March 7, 2011.

Baker, M.
1906 Geographic Dictionary of Alaska, Second Edition. Prepared by James McCormick. U.S. Department of the Interior, U.S. Geological Survey. U.S. Government Printing Office, Washington D.C.

Braund, Stephen R. & Associates (SRB&A)
2011 Chukchi and Beaufort Seas National Pollutant Discharge Elimination System Exploration General Permits Reissuance, Report of Traditional Knowledge Workshops – Point Lay, Barrow, Nuiqsut, and Kaktovik. Prepared for Tetra Tech and U.S. Environmental Protection Agency, Anchorage, Alaska.
2010a Subsistence Mapping of Nuiqsut, Kaktovik, and Barrow. Prepared for United States Department of the Interior, Minerals Management Service, Alaska OCS Region, Environmental Studies Program, Anchorage, Alaska.
2010b Literature Review of North Slope Marine Traditional Knowledge. Prepared for Tetra Tech and U.S. Environmental Protection Agency, Anchorage, Alaska.
2008 Point Lay Subsistence and Cultural Needs Study. Bowhead Whales. Prepared for North Slope Borough. Department of Wildlife Management. March 2008. Anchorage, Alaska.
2005 Traditional Knowledge and Subsistence Use Study within the Area of Cape Seppings and Rabbit Creek. Kotzebue, Kivalina, and Noatak. Prepared for Northwest Arctic Borough. December 2005.

Braund, Stephen R. & Associates (SRB&A) and Institute of Social and Economic Research (ISER)
1993a North Slope Subsistence Study: Wainwright, 1988 and 1989. Prepared for the U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region Social and Economic Studies, Technical Report No. 147, OCS Study MMS 91-0073.
1993b North Slope Subsistence Study: Barrow, 1987, 1988, and 1989. Prepared for the U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region Social and Economic Studies, Technical Report No. 149, OCS Study MMS 91-0086.

Chance, N.
n.d. The 'Lost' Reindeer of Arctic Alaska. Accessed June 9, 2011.
http://arcticcircle.uconn.edu/NatResources/reindeer.html

Frost, K. and R. Suydam
2007 Subsistence Harvest of Beluga Whales, *Delphinapterus leucas*, in Northern and Western Alaska, 1987-2006. Draft.

George, J. and A. Fuller
1997 Evaluation of subsistence harvest data from the North Slope Borough 1993 census for eight North Slope Villages; for the calendar year 1992. Report by the Department of Wildlife Management, North Slope Borough. Barrow. 152 p

Goodwin, W.
2013 Alaska Beluga Whale Committee. 2013 Open Water Meeting. Presentation by Robert Suydam.
2012 Alaska Beluga Whale Committee. 2012 Open Water Meeting. Presentation by Robert Suydam.
2011 Alaska Beluga Whale Committee. 2011 Open Water Meeting. Presentation by Robert Suydam.

Impact Assessment, Inc. (IAI)
1989a Point Lay Case Study. U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region Social and Economic Studies Technical Report No. 139. (A99/PB 90/26937/AS) (MMS 89-0093). Anchorage, Alaska.
1989b Point Lay Biographies. Final Technical Report. U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region Social and Economic Studies Technical Report No. 140. (MMS 89-0094). Anchorage, Alaska

Ivie, P. and W Schneider
1988 Land Use Values Through Time in the Wainwright Area. North Slope Borough, Anthropology and Historic Preservation Cooperative Park Studies Unit, University of Alaska. Fairbanks, Alaska :

Jackson, S,
1904 Thirteenth Annual Report on Introduction of Domestic Reindeer into Alaska, with Map and Illustrations. Senate Document No. 210, 58th Congress, 2d Session. U.S. Government Printing Office, Washington, D.C.

Kassam, K.
2001 Passing on the Knowledge: Mapping Human Ecology in Wainwright, Alaska. Calgary : Arctic Institute of North America.

Luton, H.
1986 Wainwright, Alaska : the Making of Inupiaq Cultural Continuity in a Time of Change. Thesis (Ph. D.) - University of Michigan.

National Oceanic and Atmospheric Administration (NOAA)
2013 Northern Pinnipeds (Ice Seals & Walruses) Unusual Mortality Event (UME) Update. March/April 2013. National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. http://www.fakr.noaa.gov/protectedresources/seals/ice/diseased/ume_update0413.pdf Accessed April 16, 2012.

Neakok, W., D. Neakok, W. Bodfish, D. Libbey, E. Hall, Jr. and the Point Lay Elders
1985 To Keep the Past Alive: The Point Lay Cultural Resource Site Survey. North Slope Borough Planning Department. Barrow, Alaska.

Nelson, R.
1982 Harvest of the Sea: Coastal Subsistence in Modern Wainwright. A report for the North Slope Borough's Coastal Management Program. Barrow, Alaska: North Slope Borough.

Porter, R.
1893 Report on Population and Resources of Alaska at the Eleventh Census: 1890. Robert Porter, Superintendent, U.S. Department of the Interior, Census Office. U.S. Government Printing Office, Washington D.C.

Schneider, W and R. Bennett
1979 Point Lay synopsis. In Native Livelihood and Dependence. A study of land use values through time. Prepared by the North Slope Borough Contract Staff for NPR-A Work Group 1. Field Study 1. pp. 107-109

Sechrist, F., R. Fett, and D. Perryman
1989 Forecasters Handbook for the Arctic. Naval Environmental Prediction Research Facility. Technical Report TR 89-12. United States Navy. Monterey, CA.

Spencer, Robert F.
1976 The North Alaskan Eskimo: A Study in Ecology and Society. Smithsonian Institution Press. Washington, DC.

Stern, R., E. Arobio, L. Naylor and W. Thomas
1980 Eskimos, Reindeer and Land. Bulletin 59. School of Agriculture and Land Resources Management, Agricultural and Forestry Experiment Station, University of Alaska, Fairbanks.

Suydam, R., J. George, B. Person, C. Hanns, and G. Sheffield
2010 Subsistence Harvest of Bowhead Whales (*Balaena mysticetus*) by Alaskan Eskimos during 2010. Department of Wildlife Management, North Slope Borough. Alaska Department of Fish and Game. Marine Advisory Program.

Suydam, R., J. George, B. Person, C. Hanns, R. Stimmelmayr, L. Pierce, and G. Sheffield.
2012 Subsistence Harvest of Bowhead Whales (*Balaena mysticetus*) by Alaskan Eskimos during 2012. Department of Wildlife Management, North Slope Borough. University of Alaska Fairbanks, Marine Advisory Program.
2011 Subsistence Harvest of Bowhead Whales (*Balaena mysticetus*) by Alaskan Eskimos during 2011. Department of Wildlife Management, North Slope Borough. University of Alaska Fairbanks, Marine Advisory Program.

Suydam, R., J. George, C. Rosa, B. Person, C. Hanns, and G. Sheffield
2009 Subsistence Harvest of Bowhead Whales (*Balaena mysticetus*) by Alaskan Eskimos during 2009. Department of Wildlife Management, North Slope Borough. Alaska Department of Fish and Game. Marine Advisory Program.

U.S. Census Bureau
2011 2010 Census Tables. Website (http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml) accessed on April 14, 2011.
1884 Alaska: Its Population, Industries, and Resources. By Ivan Petroff. Government Printing Office. Washington

U.S. Department of the Interior, Bureau of Education
1904 Annual Statement of the Commissioner of Education to the Secretary of the Interior for the Fiscal Year Ended June 30, 1904. U.S. Government Printing Office, Washington D.C.

U.S. Department of the Interior, Bureau of Indian Affairs
1938 1938 Census, Point Lay. Tribal Census Rolls, 1935-66. Juneau Area Office, Record Group 75, File Folder 1306-07, Point Lay, 1938 and 1940 census. National Archive and Records Administration – Pacific Alaska Region. Anchorage, Alaska.

U.S. Department of the Interior, Fish and Wildlife Service
2012 Subsistence Harvested Walrus Tagging Statistics by Location and Year. Marine Mammals Management Office. Anchorage, AK.

Western Regional Climate Center
n.d. Desert Research Institute. Prevailing Wind Direction: Alaska. http://www.wrcc.dri.edu/htmlfiles/westwinddir.html. Accessed May 9, 2011.

APPENDIX A: WEATHER STATION DATA SAMPLE

Table A-1: Vantage Pro 2 Weather Data Sample for Point Lay

Date	Time	Temp Out	Wind Speed	Wind Dir	Bar
4/23/2010	12:00 P.M.	13.6	1	ENE	29.888
4/23/2010	1:00 P.M.	13.2	2	W	29.898
4/23/2010	2:00 P.M.	15.5	3	NE	29.901
4/23/2010	3:00 P.M.	17.4	1	W	29.899
4/23/2010	4:00 P.M.	19.8	3	N	29.904
4/23/2010	5:00 P.M.	23.2	5	NE	29.908
4/23/2010	6:00 P.M.	23.5	2	NE	29.918
4/23/2010	7:00 P.M.	23.3	3	W	29.915
4/23/2010	8:00 P.M.	25.3	1	WNW	29.922
4/23/2010	9:00 P.M.	27.6	1	NE	29.929
4/23/2010	10:00 P.M.	23.7	3	ENE	29.937
4/23/2010	11:00 P.M.	24.3	3	SW	29.931
4/24/2010	12:00 A.M.	25.4	2	W	29.928
4/24/2010	1:00 A.M.	25.2	1	W	29.933
4/24/2010	2:00 A.M.	25.8	1	SW	29.929
4/24/2010	3:00 A.M.	25.3	2	W	29.93
4/24/2010	4:00 A.M.	25	3	W	29.929
4/24/2010	5:00 A.M.	24.3	4	SW	29.926
4/24/2010	6:00 A.M.	24.3	7	SW	29.929
4/24/2010	7:00 A.M.	22.9	11	SW	29.943
4/24/2010	8:00 A.M.	21	12	SW	29.953
4/24/2010	9:00 A.M.	20.3	15	SW	29.972
4/24/2010	10:00 A.M.	19.4	15	SW	29.997
4/24/2010	11:00 A.M.	18.6	13	SW	30.019
4/24/2010	12:00 P.M.	18.5	13	SW	30.032
4/24/2010	1:00 P.M.	17	15	SW	30.058
4/24/2010	2:00 P.M.	15.7	18	SW	30.082

Table A-2: NOAA Weather Data Sample for Wainwright

Date	Time	Dry Bulb Temperature (F)	Wind Speed (MPH)	Wind (Cardinal Direction)	Station Pressure (inches and hundredths)
20100101	53	-8	5	**N**	30.53
20100101	153	-7	6	**N**	30.52
20100101	253	-6	8	**N**	30.51
20100101	353	-5	10	**N**	30.51
20100101	453	-4	13	**NNE**	30.49
20100101	553	-4	15	**NNE**	30.48
20100101	653	-3	15	**NNE**	30.47
20100101	753	-3	15	**NNE**	30.47
20100101	853	-2	14	**NNE**	30.46
20100101	953	-2	17	**NNE**	30.45
20100101	1053	-1	16	**NNE**	30.45
20100101	1153	-1	16	**NNE**	30.45
20100101	1253	0	17	**NNE**	30.44
20100101	1353	0	17	**NNE**	30.43
20100101	1453	0	16	**NNE**	30.43
20100101	1553	0	21	**NNE**	30.42
20100101	1653	1	17	**NNE**	30.42
20100101	1753	1	16	**NNE**	30.42
20100101	1853	1	16	**NNE**	30.42
20100101	1953	1	16	**NNE**	30.42
20100101	2053	1	15	**NNE**	30.42
20100101	2153	1	14	**NNE**	30.41
20100101	2253	2	14	**NNE**	30.41
20100101	2353	2	14	**NNE**	30.4

Table A-3: Hoefler Weather Data Sample for Point Lay

Date & Time	Temperature (C)	Wind Speed (m/s)	Wind Direction (degrees)	Pressure (mb)
5/26/2010 7:00 A.M.	-1.24	7.09	69.8	1018.9
5/26/2010 8:00 A.M.	-1.54	7.02	70.1	1018.9
5/26/2010 9:00 A.M.	-0.49	6.65	71.8	1018.8
5/26/2010 10:00 A.M.	-0.45	5.51	72.8	1018.9
5/26/2010 11:00 A.M.	0.65	4.18	61.9	1018.8
5/26/2010 12:00 P.M.	1.16	3.92	49.3	1018.8
5/26/2010 1:00 P.M.	1.89	3.97	44.2	1018.7
5/26/2010 2:00 P.M.	2.36	3.58	53.5	1018.6
5/26/2010 3:00 P.M.	3.06	3.18	55.7	1018.7
5/26/2010 4:00 P.M.	3.61	2.74	35.3	1018.6
5/26/2010 5:00 P.M.	2.42	2.93	32.5	1018.6
5/26/2010 6:00 P.M.	1.9	3.35	24.2	1018.7
5/26/2010 7:00 P.M.	1.63	3.99	52.2	1018.4
5/26/2010 8:00 P.M.	2.55	4.43	76.5	1018.2
5/26/2010 9:00 P.M.	2.36	3.85	40.8	1018.3
5/26/2010 10:00 P.M.	1.8	5.06	33.6	1018.2
5/26/2010 11:00 P.M.	1.14	5.11	36	1018.1
5/27/2010 12:00 A.M.	0.87	5.08	19.6	1018.2
5/27/2010 1:00 A.M.	0.74	6.52	42.7	1018
5/27/2010 2:00 A.M.	0.94	6.77	60.5	1017.2
5/27/2010 3:00 A.M.	1.32	7.11	67.2	1016.7
5/27/2010 4:00 A.M.	1.46	7.92	75.9	1016.4
5/27/2010 5:00 A.M.	1.15	6.42	74.9	1016.5
5/27/2010 6:00 A.M.	1.12	4.38	65	1016.5

APPENDIX B: DATA COLLECTION GUIDES

2010 FIELD DATA COLLECTION GUIDE

Hunting Trip Data Recording Form

Offshore Hunting Data Collection Form, 2010
Use one form per hunting trip. Attach additional sheets as needed.

Respondent Code: ☐ **Additional Respondent Codes:** ☐ **Intw Loc:** ☐

Name of other non-project hunter(s) completing interview: ☐ ☐ **Respondent did not Participate in Trip**

Section A: Hunting Activity Details

[Use GPS Data or ask Respondent if no GPS Data]:

Time of Departure: ☐ AM/PM **Date of Departure:** ☐

Time of Return: ☐ AM/PM **Date of Return:** ☐ **Total Duration of Trip (Hrs/Mins):** ☐

Transportation Method: ☐ Boat ☐ Snowmachine ☐ Other (Describe) ☐

# of Boats ☐ # of Snowmachines ☐ in hunting party Total # Trip Participants (all boats): ☐

Vessel 1 Code (Respondent Boat): ☐ Vessel 2 Code: ☐ Vessel 3 Code: ☐

Vessel 4 Code: ☐ Vessel 5 Code: ☐ Vessel 6 Code: ☐

Composition of Hunting Party in Respondent's Boat:

	Name/Relationship to Respondent	M/F		Name/Relationship to Respondent	M/F
1			5		
2			6		
3			7		
4			8		

Main Purpose of Trip (Target Species): ☐

	Species Harvested/Struck	# Struck	# Harvested
1			
2			
3			
4			
5			

Estimated Trip Costs:

Gas: $ ☐
Ammunition: $ ☐
Food: $ ☐
Other: $ ☐
(Describe): ☐

Section B: Hunting Conditions

Weather Conditions

Wind Speed: ☐ ☐ mph ☐ knots Wind Direction: ☐

Open Water Conditions ☐ ☐ Calm ☐ Choppy ☐ Rough

Fog/Cloud Cover ☐ ☐ Clear ☐ Part Cloudy ☐ Foggy ☐ Raining ☐ Overcast ☐ Smoky

Ice Conditions ☐ ☐ Ice Free ☐ Open Water ☐ Open Ice ☐ Compact Ice

Did weather conditions influence the hunt? If so, how? ☐

Safety/Access

Did hunter have difficulty accessing hunting area? ☐ Yes ☐ No

Describe: ☐

Did anything make hunting less safe? ☐ Yes ☐ No

Describe: ☐

Did hunter experience accidents/mishaps? ☐ Yes ☐ No

Describe: ☐

Did hunter travel farther than usual? ☐ Yes ☐ No

Describe: ☐

Did the trip cost more than usual? ☐ Yes ☐ No

Describe: ☐

Did any meat spoil? ☐ Yes ☐ No

Describe: ☐

Section C: Subsistence Resource Observations

Did the hunter notice anything unusual about: ☐ **Behavior** of Subsistence Resources ☐ Appearance/**Health** of Subsistence Resources ☐ Location/**Distribution** of Subsistence Resources ☐ **Abundance** of Subsistence Resources

For each observation, fill out the following:

Type of Observation (Behavior, Health, Distribution, Abundance)	**Species**	**How** was it unusual?	**Why** was it unusual or what caused it?

Section D: Waypoints or Coordinates Noted *(If no coordinates, record the waypoint on MapSource.)*

**Attach additional sheets as needed*

			Strike/Harvest Site			**Human Activity**		**Other**	
Waypoint #	**Lat/Long**	**Time (am/pm)**	**Species**	**#Struck**	**#Harv.**	**Note type of Activity (Barge, Air Traffic, Noise, etc.)**	**Affect Hunt? (Y/N)**	**Wildlife, weather, sick animal observations, etc.**	**Notes/Description**

☐ **GPS TRACK? (Check if yes)** **Notes:**

2011-2012 FIELD DATA COLLECTION GUIDE

Hunting Trip Data Recording Form

Offshore Hunting Data Collection Form, 2011
Use one form per hunting trip. Attach additional sheets as needed.

Respondent Code: ☐ **Additional Respondent Codes:** ☐ **Intw Loc:** ☐

Name of other hunter(s) completing interview: ☐ ☐ **Respondent did not Participate in Trip**

Section A: Hunting Activity Details

[Use GPS Data or ask Respondent if no GPS Data]:

Time of Departure: ☐ AM/PM **Date of Departure:** ☐ **Total Duration of Trip (Hrs/Mins):** ☐

Time of Return: ☐ AM/PM **Date of Return:** ☐ ☐ **Duration/Departure Added by Respondent**

Transportation Method: ☐ Boat ☐ Snowmachine ☐ Other (Describe) ☐

# of Boats ☐ # of Snowmachines ☐ in hunting party Total # Trip Participants (all boats): ☐

Vessel 1 Code (Respondent Boat): ☐ Vessel 2 Code: ☐ Vessel 3 Code: ☐

Vessel 4 Code: ☐ Vessel 5 Code: ☐ Vessel 6 Code: ☐

Composition of Hunting Party in Respondent's Boat:

	Name/Relationship to Respondent	M/F		Name/Relationship to Respondent	M/F
1			5		
2			6		
3			7		
4			8		

Main Purpose of Trip (Target Species): ☐

	Species Harvested/Struck	# Struck	# Harvested
1			
2			
3			
4			
5			

Estimated Trip Costs:

Gas: $ ☐

Ammunition: $ ☐

Food: $ ☐

Other: $ ☐

(Describe): ☐

Section B: Hunting Conditions

Weather Conditions

Wind Speed: ☐ ☐ mph ☐ knots Wind Direction: ☐

Open Water Conditions: ☐ ☐ Calm ☐ Choppy ☐ Rough

Fog/Cloud Cover: ☐ ☐ Clear ☐ Part Cloudy ☐ Foggy ☐ Precip ☐ Overcast ☐ Smoky

Ice Conditions: ☐ ☐ Ice Free ☐ Open Water ☐ Open Ice ☐ Compact Ice

Weather influence the hunt? If so, how? ☐ ☐ Wind ☐ Ice ☐ Precip/Vis ☐ Water ☐ Other ☐ N/A

Safety/Access

Did hunter have difficulty accessing hunting area? ☐ Yes ☐ No

Describe: ☐

Did anything make hunting less safe? ☐ Yes ☐ No

Describe: ☐

Did hunter experience accidents/mishaps? ☐ Yes ☐ No

Describe: ☐

Did hunter travel farther than usual? ☐ Yes ☐ No

Describe: ☐

Did the trip cost more than usual? ☐ Yes ☐ No

Describe: ☐

Did any meat spoil? ☐ Yes ☐ No

Describe: ☐

Section C: Waypoints or Coordinates Noted *(If no coordinates, record the waypoint on MapSource)*

**Attach additional sheets as needed*

			Strike/Harvest Site			Human Activity		Other	
Waypoint #	Lat/Long	Time (am/pm)	Species	#Struck	#Harv.	Note type of Activity (Barge, Air Traffic, Noise, etc.)	Affect Hunt? (Y/N)	Wildlife, weather, sick animal observations, etc.	Notes/Description

Notes:

The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Bureau of Ocean Energy Management

BOEM
Bureau of Ocean Energy Management

As a bureau of the Department of the Interior, the Bureau of Ocean Energy Management (BOEM) primary responsibilities are to manage the mineral resources located on the Nation’s Outer Continental Shelf (OCS) in an environmentally sound and safe manner.

The BOEM Environmental Studies Program

The mission of the Environmental Studies Program (ESP) is to provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments.


Welcome to
Wainwright
Paġlagivsi Ulgunigmun
CITY OF WAINWRIGHT
WAINWRIGHT ALASKA 99782