Annual Assessment of Subsistence Bowhead Whaling Near Cross Island, 2004: cANIMIDA Task 7 Annual Report

Contract Number 1435-01-04-CT-32149

Prepared for:
U.S. Department of the Interior
Minerals Management Service
Alaska Outer Continental Shelf Region
Anchorage, AK

Prepared by:
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Applied Sociocultural Research
Anchorage, AK

January 2006

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Executive Summary

This Task Order, funded by the Minerals Management Service (MMS) has as its broad objective the description of subsistence whaling as currently conducted near Cross Island by residents of Nuiqsut. This effort is designed to measure basic descriptive parameters of Cross Island whaling so that observed changes (if any) can be analyzed in relation to such factors as oil and gas activities, weather and ice conditions, or other variables. Special attention is devoted to geospatial information through the sharing of GIS information by participating whaling crews. Project reports are only for the purposes of reporting information collected, with no analysis of the information either as a self-contained database or in conjunction with the many pertinent external databases. As a second broad objective, the project is designed as a collaborative effort of MMS and its contractor, Applied Sociocultural Research (ASR), the subsistence whalers from Nuiqsut, and the Alaska Eskimo Whaling Commission (AEWC). The project will develop a system for collecting information that local whalers themselves can adopt, adapt, and maintain. This report documents the results of the first year of this component of the cANIMIDA project and will be continued by at least two (possibly three) years of additional data collection.

Three methods of information collection are employed – systematic observations, collection of daily vessel locational information from handheld GPS units, and whalers' self-reports and perceptions. Emphasis has been placed on such measures as:

- Number of crews actively whaling (observation)
- Size and composition of crews, and fluctuation over the whaling season (observation)
- Number of whales harvested (observation, self-report)
- Days spent whaling, and days prevented from whaling (weather, equipment failure or repair, etc.) (observation, self-report)
- Days suitable for whaling when whaling did not occur (observation, self-report)
- Subsistence activities occurring other than whaling (self-report, observation)
- Location of whale sightings and whale harvest (GPS, self-report)
- Location of whale searching (GPS, self-report)
- Local weather and ice conditions (observation,
- self-report)
- Bowhead whale behavior in the Cross Island area, and indicated differences from past experience (self-report)
- Changes in access or other issues related to the whale hunt, such as increased effort for the same (or reduced) harvest, increased risk, increased cost (self-report)

In 2004, four crews from Nuiqsut whaled from Cross Island. At least one crew was on Cross Island a total of thirty days (counting day of arrival and day of departure). There was an additional five days, breaking up this thirty days, when no crew was on the island, due to very bad weather conditions. One crew went out much earlier (and left a day later) than the other three crews – two crews were on Cross island for a period of twenty-one days (counting travel days) and four crews were on the island for a period of fifteen days (counting travel days). All three whales harvested were taken within this fifteen day period.

At least two boats went whaling on ten different days, and a single boat went whaling on two additional days. Whales were actually seen on five of these days, and strikes (and harvests) were made on three of these days. Weather prevented whaling on five days when at least one crew was on Cross Island (as well as the five day break when no crews were on the island). One day was devoted to butchering after the first two whales were taken. Five days were devoted to travel. No scouting occurred on an additional seven days because there were too few boats available to go out (mainly due to mechanical problems, but also because of competing needs such as taking meat back to Nuiqsut to "feed the village" or going to West

Dock for parts and supplies). Three whales were harvested, with one strike unused. There were no "struck-and-lost" whales.

Weather conditions were again poor during the 2004 season, and Nuiqsut whalers scouted for whales on all days when conditions allowed (and took the second whale the day after they took the first). Whalers scouted on at least three days when conditions for whaling were marginal at best – on two of them only one crew went out (with two boats), and on the third only two crews went out (with four boats). The number of crew members in each vessel scouting for whales varied 2 to 8 per boat per day (most commonly 3 or 4), with an average of 3.6 crew members. Scouting trips varied in duration from two hours twenty-six minutes to seventeen hours one minute, with an average of seven hours eighteen minutes and a median or six hours six minutes. Total trip distance varied from 7.8 to 104 miles with a greatest distance from Cross Island of from 2 to 24.7 miles (average round trip 47.8 miles, median round trip 40.3 miles, average furthest distance from Cross Island of 12.5 miles). Whales were struck from 8.1 to 11.6 (average 9.7) miles from Cross Island. Other daily trip characteristics -- GPS tracks, marked points, self-report of significant sightings, and other perceptions – were also collected and are discussed in the report.

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List of Tables, Figures, and Photographs

Acronyms and Abbreviations Used in Tables, Text, and Appendices

Acronym or Abbreviation	Expanded Term or Reference
AA[1]	Akiviana Whaling Crew
BO[1]	Oyagak Whaling Crew
IAN	Aqargiun Whaling Crew
NAP[1]	Napageak Whaling Crew
NUK[1]	Nukapigak Whaling Crew
#	Number
ACS	Alaska Clean Seas
AEWC	Alaska Eskimo Whaling Commission
ANCSA	Alaska Native Claims Settlement Act
ANIMIDA	Arctic Nearshore Impact Monitoring in Development Area
BP	Barometric Pressure
BPXA	British Petroleum Exploration Alaska
cANIMIDA	continuation of ANIMIDA
CI	Cross Island
esp.	especially
F	Fahrenheit (temperature measurement)
ft	Feet
GIS	Geographical Information System
GPS	Geographic Positioning System
HAD	Human Activities Database
HCC	High Cloud Cover
HP	Horse Power
IHLC	Inupiat History, Language, and Culture Commission
IWC	International Whaling Commission
MFCI	Miles From Cross Island
mmddyy	Date Format – month/day/year
MMS	Minerals management Service
MPH	Miles Per Hour
N,S,E,W and combinations	Compass directions (north, south, east, west, northeast, etc)
NA	Not Applicable
NQT	Nuiqsut
NSB	North Slope Borough
NSB DW	North Slope Borough Department of Wildlife Management
OCS	Outer Continental Shelf
OWA	Oil/Whalers Agreement
TOT	Total Time (of individual boat trips)
UNK	Unknown
w/number or /number	With the specified number (of people)
WCA	Whaling Captains Association
WCC	Whaling Communication Center
WD	West Dock (Prudhoe Bay)
WF	Weather File (time series of weather station measurements)

[1]When crews use multiple boats, each boat is differentiated by a number after the crew designation (1-4)

Preface

While this project is conceptually simple and straightforward, the logistics and funding history have been more complicated. This report summarizes the observations from the first year of a 3-year (2004-2006) task as a component of the cANIMIDA project. However, it continues the efforts of an essentially identical 3-year (2001-2003) task of the ANIMIDA project. Thus the final result will be a series of at least six such annual reports establishing a short time series (2001-2006). Thus, this is the fourth annual report on the Cross Island fieldwork, and the first year of the cANIMIDA effort, of what will be a time series of at least six such reports, to be followed by a single overall analytical report.

The 2004 Annual Report consists of several parts:

- The main body of the report, provided in hard copy and in electronic form (PDF) on the CD-ROM accompanying the report;
- Appendix A, Daily Boat Report Forms for 2004 – in electronic form (PDF) only, on the CD-ROM accompanying the report;
- Appendix B, Daily Boat GPS Tracks for 2004, displayed as figures – in electronic form (PDF) only, on the CD-ROM accompanying the report; and
- Cross Island Weather File for 2004 – in electronic form (Excel) only, on the CD-ROM accompanying the report.
- The processed GPS files, in original MapSource form and as DXF files, are held by the MMS Alaska OCS Region and are not distributed as part of the annual report.

Products previously produced for this project have been:

- 2001 ANIMIDA Task Order 4 Annual Report (Galginaitis and Funk 2004a)
- 2002 ANIMIDA Task Order 4 Annual Report (Galginaitis and Funk 2004b)
- 2003 ANIMIDA Task Order 4 Annual Report (Galginaitis and Funk 2005b)
- ANIMIDA Task Order 4 Final Report (Galginaitis and Funk 2005a)
- Presentation at the Alaska Outer Continental Shelf Region 9th Information Transfer Meeting (3/12/03 in Anchorage, 3/14/03 in Barrow)
- Presentation at the SETAC 24th Annual Meeting (11/12/03 in Austin, Texas)
- Presentation at the Alaska Outer Continental Shelf Region 10th Information Transfer Meeting (3/16/03 in Anchorage, 3/18/03 in Barrow).
- Presentation at the Alaska Outer Continental Shelf Region 11th Information Transfer Meeting (3/16/05 in Anchorage, 3/18/05 in Barrow)

Acknowledgments

This work would not have been possible without the assistance of a great number of people. Foremost among them must be the whalers and other residents of Nuiqsut. While it is unfair to single out individuals when all provided essential information and support in what is after all a communal and cooperative undertaking, I would be remiss if I did not explicitly thank those whaling captains and their crews who extended me the hospitality of their cabins. This is the report on my fourth field season on Cross Island, for which the late Thomas Napageak served as a most gracious host. I am most grateful for the opportunity he gave me to know him in a way that I had not before. Paul Kittick, as my host for the first year when the project was still an unknown quantity to the whalers, also has my utmost appreciation. Archie Ahkiviana agreed to be my host the second year, when Paul did not whale, and Billy Oyagak served as my host the third season, and they both also have my profound thanks. I of course also thank the other crews who were out on Cross Island for the 2001-2004 seasons (Nukapigak, and Aqargiun), and David Pausanna for all the help he has given me over the phone and while I have been in Nuiqsut. I cannot begin to list the other residents of Nuiqsut who shared much more of their time and knowledge than I had any reason to expect. Maggie Ahmaogak of the AEWC has also been generous with her advice, support, and cooperation.

Industry has also provided a good deal of help in various forms, from advice to more concrete logistical support. Ray Jucubczak, and Concie Rock at BPXA were especially notable in this regard, although several individuals at Alaska Clean Seas were also very helpful. BPXA also assisted with the transformation of the raw GPS track information into more usable GPS-based maps for the 2001-2003 data, which included generating a basic basemap.

MMS, as the sponsor of the project, also deserves a formal “Thank you.” Dick Prentki has been an ideal COTR, even though the course of the project has not always been smooth.

Lastly, the entities for which ASR performed this work as a subcontractor for the 2001-2003 field seasons, LGL Limited of Alaska and Batelle, must be thanked for their willingness to trust that the work would be accomplished with a minimum of oversight on their part. The budget for this limited task would not support a good deal of administrative overhead, and both worked with me to make it work. I am especially grateful to Dale Funk at LGL.

The above notwithstanding, all errors and shortcomings of this report are the responsibility of Michael Galginaitis and ASR. Please advise me of as many as you find, so that whatever effort continues in this regard can bear as much fruit as possible. Two additional years of data collection have been funded, 2005-2006. Plans are being made for the 2005 work as this draft 2004 report is composed. But again, none of this work would be possible without the cooperation and support of the Nuiqsut whalers, to whom I again give my most profound thanks.

Introduction and Objectives of the Task Order

This Task Order, funded by the Minerals Management Service (MMS) has as its broad objective the description of subsistence whaling as currently conducted near Cross Island by residents of Nuiqsut. It is the only socioeconomic component of the cANIMIDA program, which focuses more on physical science. While "traditional" subsistence whaling has been well documented in a number of locations, contemporary subsistence whaling is not as well documented, especially in terms of changes over time. This effort is designed to measure basic parameters of Cross Island whaling so that observed changes (if any) can in the future be analyzed in relation to such factors as oil and gas activities, weather and ice conditions, or other variables. Observations, and the narrative annual report summarizing them, will focus on descriptive measures of activities associated with whaling. Special attention is devoted to geospatial information through the sharing of GIS information by participating whaling crews. Project annual reports are only for the purposes of reporting information collected, with little analysis of the information either as a self-contained database or in conjunction with external databases. Among the many external databases of potential pertinence to the descriptive information collected under this task order are the Human Activities Database (HAD), although the database does not contain information later than 2000, and thus does not cover the time period of this project. Thus the HAD is primarily historical and is of most interest in terms of what information can be recovered about Nuiqsut whaling seasons prior to 2001. Of perhaps more potential utility for the more detailed information collected for this effort through the ANIMIDA and cANIMIDA projects are remote sensing information on ice cover or other geophysical parameters. Other linkages for potential future analysis (AEWC records of whale harvest, or untranscribed IHLC tapes, for example) also exist. Some of these may be discussed in the final synthetic report, following the last field season for this task under cANIMIDA (now budgeted for 2006, but MMS has an option for an additional year in 2007).

As a second broad objective, the project is designed as a collaborative effort among MMS (and its contractor, Applied Sociocultural Research), the subsistence whalers from Nuiqsut, and the Alaska Eskimo Whaling Commission (AEWC). Beyond the goal of six years of descriptive information on Cross Island subsistence whaling activities, the project was to develop a system for collecting such information that local whalers themselves could adopt, adapt, and maintain. The methodology has now been developed sufficiently, but the transition to local implementation of the program has been slow and is still in process.

This is the first field season for this task as part of the cANIMIDA project, but as discussed above the fourth field season for the overall program. Annual reports will be produced for the 2004 (this draft), 2005, and 2006 field seasons. A more analytical report summarizing and analyzing the full six years of data (2001-2006) will also be produced, after the 2006 field season (or perhaps after a 2007 field season).

An Overview of Contemporary Subsistence Whaling in Alaska

The Inupiat of the North Slope maintain a vital native culture -- with kinship, dependence on hunting wildlife resources, and a respectful relationship to the land as fundamental values. Hunting provides most of the meat consumed by Inupiat. Whaling not only provides a significant

part of this food, but is also a key social organizational activity for North Slope Inupiat. Whaling is also a central ideological idiom for the expression of key cultural values, and an important vehicle for the transmission of those values (Worl 1980, Rexford 1997). Subsistence whaling has been (and continues to be) a key focus for Inupiat and Yupik culture and society (Bering Straits area, Northern coastal Alaska) for at least 1,000 to 1,500 years (Dumond 1984, Krupnik and Stoker 1993, McCartney 1994). However, nothing more than a brief orientation to contemporary subsistence whaling in Alaska is attempted in this report, and references are illustrative, not exhaustive. This discussion provides only a general description of some key aspects of the organization of subsistence whaling, within the context of its management regime, that are important for an understanding of this project's methods and results. This discussion proceeds from the general to the more specific.

In Alaska, ten coastal communities currently field whaling crews and are members of the Alaska Eskimo Whaling Commission (AEWC). The AEWC was formed in 1977 in direct response to the International Whaling Commission's (IWC) decision to ban the Alaskan subsistence bowhead whale hunt. The IWC had two main concerns – that the bowhead whale population was too small to sustain a regular harvest, and that subsistence hunting methods were too wasteful (too many animals were killed but then "lost"). As a result of a complicated series of negotiations, the United States and the AEWC convinced the IWC to allocate an initially small quota of bowheads that could be harvested in 1978. This quota was accompanied by an data collection program to measure and monitor the bowhead whale population and the efficiency of subsistence whaling harvest. This has resulted in an increased confidence in the robust size of the bowhead whale population and an incentive for the reduction of "struck and lost" whales (increase in the efficiency of the hunt) which has been quite successful. Because the bowhead population has been steadily increasing, along with the overall success rate of the hunt, the IWC has consistently increased the quota of animals available for harvest. Currently AEWC co-manages the Alaskan subsistence bowhead whale hunt with the National Oceanic and Atmospheric Administration, Department of Commerce.

The AEWC is essentially a self-regulating body that has implemented management practices that protect the reproductive capability of the resource, increase whaling success and/or reduce waste, increase the safety of the hunt, and enforce individual accountability for not complying with these practices. For example, whales with calves cannot be taken. This not only maximizes the population's growth, but is also a safety rule, since Inupiat whalers know that bowheads are the most aggressive and dangerous animals to approach. The first strike on a whale must be made with a harpoon attached to a float. Since not all whales are killed with the first strike, the float serves to both slow the whale down and to assist the whalers in following it. A research program to increase the efficiency of whaling bombs has been ongoing, with periodic workshops to disseminate information and new technology to the whalers (2005 was the first year that the penthrite bomb was available to Nuiqsut whalers). Guidelines for the size of whales to be taken are suggested, since experience has shown that larger whales pose the potential for more wastage than smaller whales (they potentially take more time to tow and butcher, and time often is directly related to wastage). AEWC sanctions have been most severe for violation of the quota set for a given community or for striking a mother with a calf – the revocation of the right to go whaling for a specified number of years. Other sorts of violations may result in fines or public censure. In short, the AEWC has constructed a flexible system that rewards its members for

compliance with rules and practices that foster both AEWC and IWC goals, and potentially penalizes them for noncompliance. Few cases of noncompliance have occurred, and this management regime is consistently cited as one of the most successful examples of such management. Huntington 1992 provides a useful analytical discussion of these developments. The original decision documents for the 1978 IWC action (U.S. Department of Commerce 1978, FEIS) also contain much of interest.

The IWC sets an overall quota for the hunt, and the AEWC in turn allocates that quota among the whaling communities. Each whaling community is represented by a local Whaling Captains Association (WCA) at the AEWC, and each local WCA is responsible for managing the hunt in its respective community. Nuiqsut initially received an allocation of one whale landed or one strike, whichever occurred first, for 1978. That is, a harpoon that hits a whale counts as a strike, regardless of whether that animal is actually taken or not. Not all "struck and lost" whales necessarily die, but the conservative AEWC/NOAA management system assumes that they do. Nuiqsut's current allocation is four whales or four strikes. Unused strikes and quota can be transferred between communities, quota is now allocated in multi-year blocks, and there can be some "roll-over" of quota from one year to the next. Thus, the harvest in some years for any given community may be greater than the "normal" quota allocated.

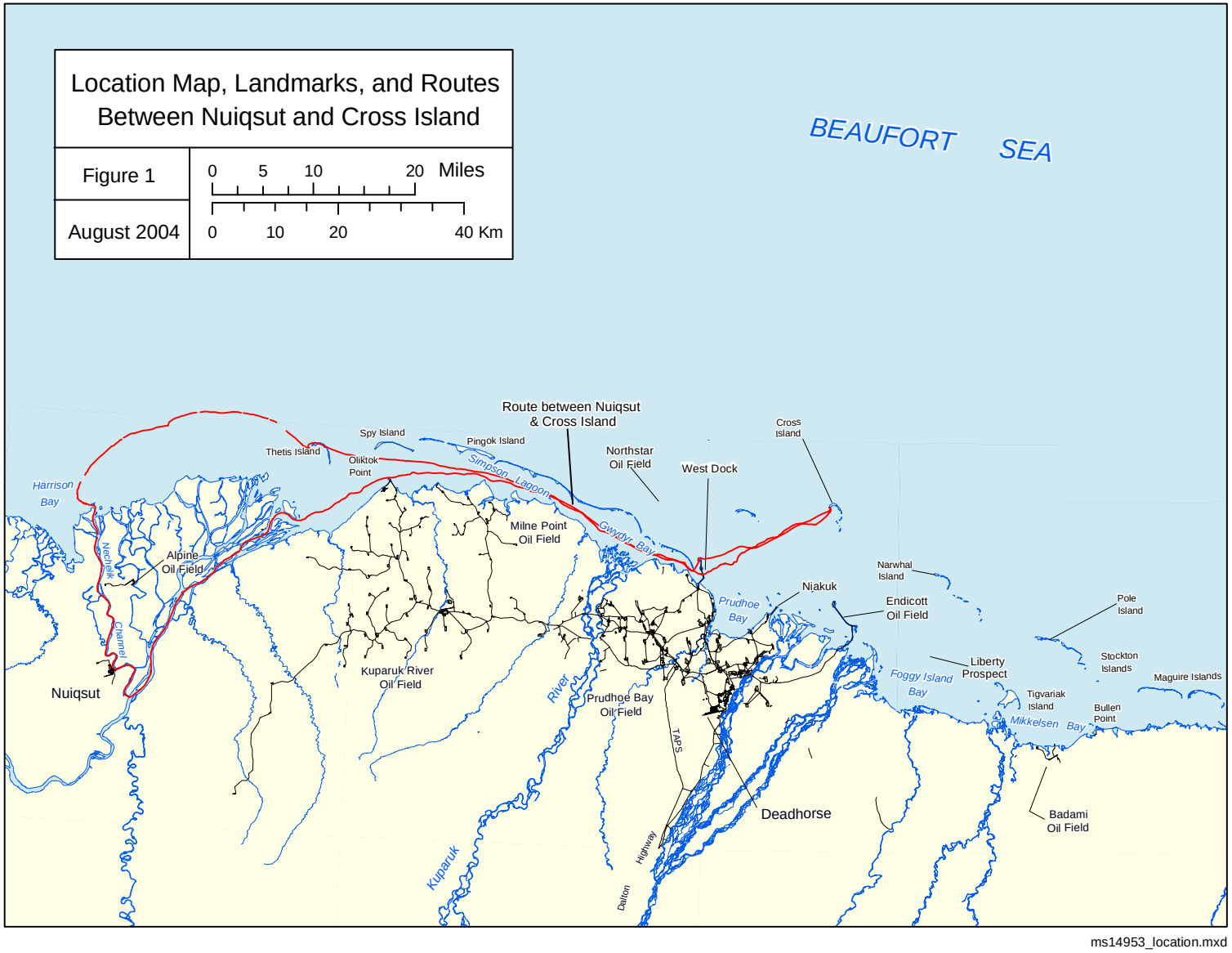
Subsistence whaling in Alaska occurs in the spring (generally April-May) and the fall (generally September-October), when the bowhead whale migration brings them reasonably close to the whaling communities. In the spring, bowhead whales migrate north through the Bering Strait and then, in Alaskan waters, east of Point Barrow into Canadian waters, where they spend the summer (some also go west into Russian waters). In the fall they reverse this course. Spring whaling differs from fall whaling. In the spring whales are migrating through relatively narrow open leads in the ice whereas in the fall the water is generally more open. Some years can be very different, however and there can be thick floating ice near Cross Island in the fall, but this has not been the case since 2001. Spring leads do not open up close enough to Nuiqsut or Kaktovik to allow these communities to whale in the spring. In the fall, because whales are not confined by leads and generally so far offshore at those points, it is difficult in most years for whaling communities south of Barrow to whale (although Wainwright and especially St. Lawrence Island whalers have increasingly taken a few whales in the fall). Thus most whaling communities whale in the spring. Barrow whales in both the spring and the fall. Nuiqsut and Kaktovik whale only in the fall. Spring whalers have traditionally and historically used only skin boats (until recently), whereas fall whalers use more durable wood, aluminum, and fiberglass boats. This is related to three general seasonal differences: the greater need to avoid unnecessary noise in the spring, the harsher environmental conditions of fall whaling (rougher seas, more floating ice), and the greater need for speed in the fall to find and pursue whales in more open water. Recent changes in spring whaling, especially in Barrow, have been described and discussed in Wohlforth (2004), and interested readers are referred to that source. This report discusses only Nuiqsut whaling, currently conducted from and near Cross Island in the fall.

The Historical Context of Cross Island Whaling

The present community of Nuiqsut has a relatively short history, having been resettled in 1973. However, Inupiat use and occupation of the Nuiqsut area has a very long history, which is the basis for Nuiqsut's status as a village recognized under the Alaska Native Claims Settlement Act (ANCSA). Nuiqsut is located about 12 miles inland on the Colville River (Figure 1), which is not a typical location for a whaling community. However, its residents trace their ancestry to people who whaled in the mid-Beaufort Sea (including near Cross Island) in the first half of the twentieth century, as well as prior to that time. Treatments of the complex and dynamic history of the North Slope region in general, and the Nuiqsut area in particular, can be found in Brown 1979, Galginaitis et al. 1984, Hoffman et al. 1987, Galginaitis 1990, and Long 1996. These sources are the basis for the information in this section. Figure 1 shows the location of Nuiqsut on the Colville River, and Cross Island in the Beaufort Sea, as well as typical routes between Nuiqsut and Cross Island and some significant landmarks in between. Cross Island is about 73 miles northeast of Nuiqsut "as the crow flies" and from 92 to 109 miles away by boat, depending on which channel of the Colville River can be used to reach the ocean. When the water level in the river is high, the more direct route can be used. When the water level is low, the more direct river channel is too shallow for most boats, so the longer route is used. Cross Island itself is about eleven miles offshore, but more importantly from a logistical point of view is ten miles from the Endicott causeway and fifteen miles from West Dock.

Prehistoric use of Cross Island has not been well documented or investigated archaeologically, but documentation for more recent use is quite extensive. Families who lived on and used Cross Island seasonally during the first half of the twentieth century included the Woods, Pausanna, Saavgaq, Ulaaq, Ahsoak, Ahgook, Ikpikuk, Ahvakana, Akpik, Sovalik, Kaigelak, Tigulak, Ahsogeak, Ahkivgak, Ekolook, and Ekowana (Smith 1980). Perhaps most important in terms of whaling was Taaqpak, who used Cross Island as a whaling base from the early twentieth century through the late 1940s. Documentation for his whaling harvests is quite incomplete, but include accounts of whales taken near Cross Island in 1922, 1927, 1928, and 1938. Many of today's active whalers learned from Taaqpak or those who were on his crews. In turn, Taaqpak maintained that Inupiat had hunted whales near Cross Island for centuries (Carnahan 1979:21-31). Thus whaling near Cross Island has a strong cultural continuity.

When Nuiqsut was resettled in 1973, many of the original settlers traveled from Barrow with the supplies necessary for their life in tents for a year or more. They used a variety of means – sleds towed by a small Cat (a tractor with tracks), snow machines, and weasels (another sort of tracked vehicle, of WW II vintage). One of these original founders took the first whale for Nuiqsut that fall, while on his way to Kaktovik to obtain some muktuk and meat to take back to the village. He and his crew had been looking for whales and had been out about six weeks. They had not seen any whales in that time, although they had seen a great number of seals, which was about their only source of food after the third week of their trip. By the sixth week the whaling captain had concluded that they were too late – that the whales had either passed them by or were too far from the shore. On the chance that Kaktovik whalers had been more successful, he decided to go to Kaktovik to obtain some muktuk and meat to take back to Nuiqsut. They then came upon a whale in the Brownlow Point/Flaxman Island area, in shallow water. They took this whale,



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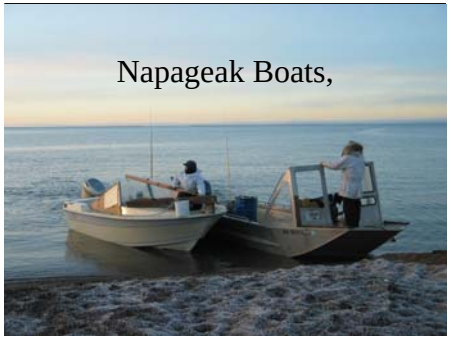
Oyagak Boats, 2004

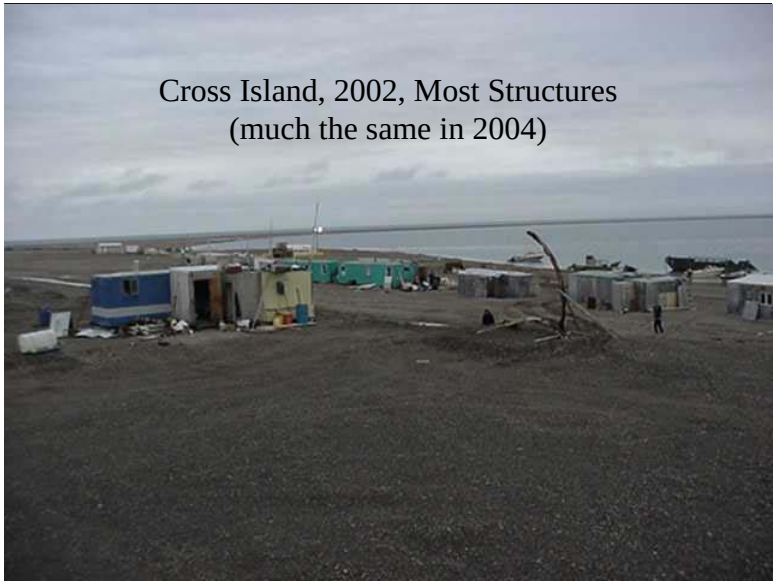

Aqargiun Boat, 2004

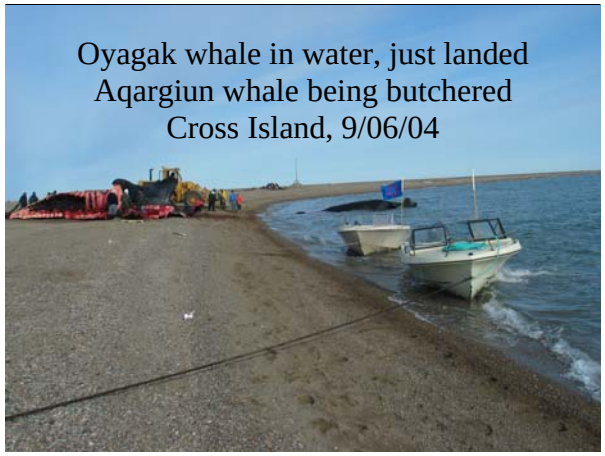

Napageak Boats,


Nukapigak Boats, 2004


Nuiqsut, July 2003

Some Contextual Photographs


Cross Island, 2002, Most Structures
(much the same in 2004)


Oyagak whale in water, just landed
Aqargiun whale being butchered
Cross Island, 9/06/04


Butchering Aqargiun whale


Butchering Aqargiun whale

butchered it, and returned to Nuiqsut with as much as possible. Several boats from Nuiqsut then made another trip to the harvest site to recover more of the muktuk.

Most of the six members of this 1973 crew are now active Nuiqsut whalers, and the captain, belying his age, was one of the most active Nuiqsut whalers until his recent death. In the years immediately after 1973 relatively few crews whaled from Nuiqsut, with relatively infrequent success. Nuiqsut whalers regularly went to other communities in the spring to participate in spring whaling (a pattern that some continue up through the present – Pausanna, personal communication), and sometimes in the fall, rather than whale in the mid-Beaufort Sea area. The next "Nuiqsut" whale was not taken until 1982, although crews whaled from various locations between 1973 and 1982 – Pingok Island, Narwhal Island, and Cross Island among them. A summary of whale harvest by Nuiqsut crews is presented in Table 1 below. Nuiqsut whalers attribute at least part of their relative lack of success in the 1970s and 1980s to interference from oil and gas exploration, as well as poor weather and ice conditions in some years, and a difficult logistical situation. These factors are also evident in the three years with the greatest incidence of "struck and lost" whales (1989-1991 or 1992). Once Cross Island was established as a logistical center for Nuiqsut whaling, and Nuiqsut whalers gained experience there, harvest success became much more regular. Another factor in this increased success may be more moderate ice conditions since 1992 (although this may in turn be counterbalanced by greater sensitivity to higher winds when ice cover is lacking).

Cross Island is a low sandy barrier island with an artificial higher area built from gravel. This higher area was constructed for past oil and gas exploratory drilling. Cross Island is about 3 miles long and 150 yards wide, and is constantly changing due to erosion and redeposition. Especially in the earlier years logistical support for whaling on Cross Island was very difficult. Whalers had to haul or find their own gas and water, and hunted and fished to provide most or all of their food. There was at most one cabin for however many people were whaling. Since the mid-1980s, with the advent of the Oil-Whalers Agreement (OWA) in 1986 between the oil industry and fall whalers (represented by the AEWC), logistical considerations have become somewhat easier. The oil and gas industry (and especially BPXA) has been providing logistical support of various sorts to Nuiqsut whalers as a mitigation measure for potentially disrupting subsistence whaling by exploration, development, and/or production activities.

At the most basic level, the OWA provides for the constant communication between industry and the whalers about all of their respective ongoing activities, so that each can avoid interfering with the other. The mechanism for this mutual communication is the Whaling Communication Center (WCC – also referred to as the Conflict Avoidance Communication Center or the Oil/Whalers Communications Center) in Deadhorse. The WCC operates during each fall whaling season and is staffed by bilingual radio operators. All industry and whaling vessels are required to report their activities to the WCC in real time (purpose, time left, time returned, significant events as they occur), and the WCC maintains a log of these reports which is archived by the AEWC. This provides a record of activities as they take place, and also documents to some extent the whaling activities. It also allows the WCC to advise industry of planned industry activities that may interfere with ongoing whaling, or to suggest windows of opportunity (when whaling is not taking place) when industry activity may have minimal potential effects. Unfortunately, vessel activity not associated with the oil and gas industry (for example, commercial barge traffic) need

Table 1: Recent Harvest of Bowhead Whales Near Cross Island

Year	Whales			Notes
	Quota	Landed	Struck & Lost	
1973	NA	1	0	
1982	1	1	0	
1986		1	0	
1987		1	0	
1989		2	2	Oil industry vessel disturbance noted
1990		0	1	Oil industry disturbance, also rough seas
1991	3	1	2	Poor weather, bad ice conditions
1992	3	2	1	
1993	3	3	0	Very favorable conditions
1995	4	4	0	
1996	4	2	0	
1997	4	3	1	
1998	4	4	1	
1999	4	3	0	
2000	4	4	0	Very favorable conditions
2001	4	3	0	
2002	4	4	1	
2003	4	4	0	Poor weather
2004	4	3	0	Poor weather

Notes: Years of no harvest and no "struck and lost" are not listed. This does not imply that no whaling effort was made that year. "Quota" was not applicable in 1973.
Source: Compiled from AWC records, personal communications from Nuiqsut whalers, and field notes from the 2001-2004 whaling seasons

not coordinate with the WCC in the same way, so that this is not a totally effective mechanism for the mitigation of all such potential effects. Other sorts of logistical support have been supplied at least in part by industry. These have included low-cost connex units (converted into seasonal cabins on Cross Island); a winch to help haul whales up at Cross Island; assistance with a steadier supply of gasoline; a generator system to supply electricity to the cabins during the whaling season; diesel fuel (for the winch and generator); water and other supplies; help with transporting the butchered whale to Nuiqsut; at least limited phone service for one or two crews; help with mobilization and demobilization; and the assurance of available emergency assistance. Alaska Clean Seas (ACS) is the industry's contractor for much of this OWA support, as a small part of its overall responsibilities (which are mainly logistical and/or related to oil spill response). BPXA and ConocoPhillips provide most of the funding for ACS, but BPXA bears the majority of OWA-related costs since ConocoPhillips has little or no offshore interests. The AEWC does pay for some of the services provided under the OWA, but the amount and exact services are not reported. Neither industry nor the AEWC discloses the financial terms of the OWA.

Preparations for whaling, in one form or another, take place during the entire year. This report focuses on the activities during the harvest season. The final preparation of boats and equipment happens in August, and a meeting of the NWCA is conducted to set a date for the start of the hunting effort and to review the rules and regulations. Labor Day is the normative date for whaling crews to go to Cross Island, but it is not unusual for individual crews to go out earlier, especially if Labor Day is "late." In 2004, one crew (with two boats) went out August 15. This was considered extremely early by the other crews, but this captain was thinking that the migration of whales had been earlier in the last several years than it had historically been and that weather in early September had been increasingly marginal for whaling in the last several years. The combination of bad weather and mechanical problems did not allow him to fully test his conjectures. The few times that his crew went scouting in August they did not see any whales. Crews prefer to go out together or with multiple boats, for safety, so that two boats is usually the minimum number that will go scouting.

Once the crews are on Cross Island the focus is on whaling. Boats usually go scouting for whales on all possible days unless a whale was taken the prior day, in which case butchering usually has priority. When a whale is taken, it is towed to Cross Island, hauled up on the gravel beach, and butchered. Select parts of the whale are sent to Nuiqsut via whaling boat the same or the next day "to feed the village" (occasionally it will be flown to Nuiqsut from West Dock, but will still be accompanied by a crew member to "run the flag" to the captain's house upon its arrival in Nuiqsut). The rest of the meat, muktuk, organs, and baleen is packed into plastic fish totes (or heavy, reinforced, corrugated cardboard boxes in 2004) and transported to West Dock and then to Nuiqsut (most recently via ACS barge and air freight). What is left of the whale is disposed of in the "bone yard." Once the quota is taken or conditions threaten to prevent returning to Nuiqsut (imminent formation of ice or increasingly bad weather), the whalers clean up the island, pack, and leave. Most will return to Nuiqsut together. Captains who have taken whales that season will fly their flags. Whaling will usually be completed by mid- to late-September.

Nuiqsut whalers first used wood boats and relatively small motors. Although they remember these vessels with fondness, and long for the economy of those motors, they also remember that they were limited in terms of speed and towing capability. Currently Nuiqsut whalers all use aluminum or fiberglass boats, 17 to 24 feet long, with motors of 80 to 225 horsepower. It is possible that a 16-foot boat may be used as a whale boat on occasion, but it would not be considered a primary boat. A few boats have cabins, but most are open. Boats typically scout for whales with a complement of three or four people, although some boat crews are as small as two and as big as eight. Although single boats do take whales on occasion, it is not encouraged and Nuiqsut boats almost always scout for whales in pairs, in case of mechanical break downs or other emergencies. Whaling crews with two or three boats are willing to whale on their own, but it is commonly agreed that five to seven boats is a preferable number to have available for whaling on a given day. More boats would be useful, and the availability of fewer boats decreases the efficiency, safety, and overall chance for success of the hunt.

Methodology

The data to be collected for this research will be discussed in terms of methods, with emphasis on the actual collection of descriptive information. In addition, it is important to address the issue of "hypothesis testing" in relation to the products of this research effort.

Hypothesis Testing

MMS explicitly required, as part of the proposal submission, the formulation of hypotheses related to potential changes in Cross Island subsistence whaling. These hypotheses can then eventually be tested using the information collected by this research effort. Two such hypotheses were formulated:

- H1: Subsistence whaling activity and behaviors in the vicinity of Cross Island are significantly changed by offshore oil developments at Northstar and/or Liberty.
- H2: General subsistence activities on/near Cross Island are significantly changed by oil and gas activities associated with Northstar and/or Liberty.

Hypotheses in the "null hypothesis" format are counterintuitive to at least some of the local research participants and perhaps to the general public at-large, although it will be necessary to express them in that form for quantitative testing. It was explicitly recognized that the annual reports would not be able to test these hypotheses. Such tests will require more data (longer time series) and significant effort devoted to analysis, and will be part of the cANIMIDA final report (after the 2006 or 2007 field season).

In summary, the hypotheses have been formulated as examples of possible relationships that are testable after concrete empirical (and ideally quantitative) measures of Cross Island whaling have been compiled for a number of years. The hypotheses thus guide the practical methods of collecting and archiving the information, to ensure that they will be useful for testing these hypotheses (as well as others as they are developed).

Descriptive Data Categories

The primary goal of data collection is the compilation of quantified measures of subsistence whaling behavior. Emphasis has been placed on such measures as:

- Number of crews actively whaling
- Size and composition of crews
- Fluctuations in active crew size and composition over the whaling season
- Number of whales harvested
- Days spent whaling
- Days prevented from whaling (weather, equipment failure or repair, etc.)
- Days suitable for whaling when whaling did not occur
- Subsistence activities occurring other than whaling
- Location of whale sightings and whale harvest
- Location of whale searching
- Local weather and ice conditions

These measures are a mixture of descriptive characteristics suggested by MMS and factors derived from or related to the perceptions of whalers on how and why whale behavior has changed, requiring that whalers change their behavior in hunting whales. For instance, size and composition of crews are fundamental descriptive characteristics that must have some relationship with the availability of whales. They also depend on the alternative (non-Cross Island) activities available to the crew members, such as alternative subsistence activities, wage labor opportunities, education, and so on. Because of the focus on Cross Island activities, information on the "full" range of factors that may be affecting the data collected was thus not compiled, but the range of possibilities was generally elicited from whalers during discussions of topics such as crew composition or crew recruitment. In this sense, these generally descriptive measures are thus also characteristics identified by Nuiqsut whalers as potentially significant and variable measures from year-to-year. The locations of whale sightings, harvests, and general whale searching behavior are all important in the examination of whether whales can be found in the same locations every season, or if this changes from year-to-year. If the latter, what causes such shifts in location is important. Nuiqsut whalers have experienced such variation and have suggested a number of factors to account for it. This project develops information to examine these questions about variation and changes in Cross Island whaling behavior. For instance, this information will allow for a preliminary (albeit rough) examination of "catch per unit effort" as well as factors associated with the distance whalers need to travel from Cross Island to whale.

Nuiqsut whalers generally agreed the suggested measures were significant and pertinent to the issues to be addressed. During the first field season (2001) Nuiqsut whalers also wanted to ensure that their more general perceptions and observations of whale behavior, and especially changes in whale behavior that had implications for hunting success or safety, were adequately noted. Such perceptions are also the most likely way for Nuiqsut whalers to contribute to future hypothesis formation and testing. Thus, information categories were added to ensure that whalers' perceptions and observations were noted on:

- Bowhead whale behavior in the Cross Island area, and differences from past experience; and
- Changes in access or other issues related to the whale hunt, such as increased effort for the same (or reduced) harvest, increased risk, increased cost, and so on.

Consultation

Consultation for the fourth field season built on that for the three previous seasons, described in the 2001-2003 annual reports and the final report based on the results of those two years. Consultation occurred in conjunction with efforts on behalf of several other MMS projects. In addition to periodic phone calls (primarily to the Native Village of Nuiqsut, the City of Nuiqsut, and various whaling captains in Nuiqsut; and the AEWC and IHLC in Barrow), consultation efforts consisted of the following:

- May/early June 2004 trip to Nuiqsut and Kaktovik for the MMS Bowhead Whaling Survey project. The primary activities during this trip were the administration of the survey and interviews specific for that other project, but in Nuiqsut some time was also devoted to discussing the results of the 2003 Cross Island whaling documentation project and the logistics of the 2004 Cross Island whaling field season.

- June 22-25 2004 trip to Nuiqsut, to attend Isaac Nukapigak' Nalukataq. Discussions about the Cross Island whaling project were also held with whalers and other Nuiqsut residents, in the midst of informal visiting.
- June 30-July 1 2004 trip to Nuiqsut for Thomas Napageak's Nalukataq. As for the trip the previous week, informal visits allowed for a great deal of consultation with the whaling captains and other interested residents about the past results of the Cross Island whaling documentation project, and the planning for the 2004 field season.
- August 16-September 22 2004 trip to Deadhorse, Cross Island, Nuiqsut, Cross Island, and Nuiqsut. The main task during this period was the collection of field data at Cross Island. However, due to the researcher's host crew returning to Nuiqsut for five days during the season (to wait out bad weather), five days (8/20-8/24) were devoted to visiting all active whaling captains (or their representatives) about the project. Further attempts were made to recruit a local field assistant who could assume primary responsibility for the project, in conjunction with a local supporting institution (such as the Kuukpik Subsistence Oversight Panel, or the Native Village of Nuiqsut). In addition, a few days at the end of the trip were spent in Nuiqsut clarifying field data with whalers and other tasks before leaving the field.
- February 1-2 2005 trip to Barrow for the MMS Whale Displacement project, with some consultation with AEWC staff for the Annual Assessment of Subsistence Bowhead Whaling Near Cross Island project.
- February 5-11 2005 trip to Kaktovik and Nuiqsut for the MMS Whale Displacement project. It was necessary to schedule these meetings too far apart for efficiency in terms for a single project (due to community meeting constraints). This scheduling did allow for the "extra" time to be used in Nuiqsut on consultation for the Annual Assessment of Subsistence Bowhead Whaling Near Cross Island project and the collection of some additional information. Results from the 2004 field season were shared with the whaling captains, some information was clarified, and arrangements made for the logistics for the 2005 field season.
- March 16 2005 presentation at the MMS Information Transfer Meeting.
- March 17-18 2005 trip to Barrow, primarily to present the 2004 results to the Barrow session of the MMS Information Transfer Meeting, but also used to consult with AEWC staff and to contact IHLC and other NSB staff in person.
- May 12-16 2005 trip to Nuiqsut and Barrow, primarily for other purposes, but also used for consultation for the Cross island project (2004 results and upcoming 2005 field season).

As in most previous years, the field season arrangements became problematic as whaling season approached. Four crews had plans to whale in 2004, essentially the same level of effort as for previous years. Tentative arrangements had been made to accompany one crew when another decided to leave for Cross Island much earlier than the other three crews. So as not to miss collecting potential GPS information, the researcher contacted the various whaling captains and was able to meet up with the crew already out at Cross Island shortly after they got there. This again required hurried consultation, by phone, with the other Nuiqsut whaling captains. One day of scouting for whales was missed, but a GPS track for it was recovered. The researcher stayed with this crew for the entire 2004 field season.

Data Collection

All whaling seasons are different, but the 2004 Cross Island whaling season exhibited several extreme characteristics – mechanical problems encountered, weather, and the length of the season. One whaling crew went to Cross Island on August 15, a much earlier date than in any prior year and one that caught the researcher (and other whaling captains) by surprise. The researcher had tentative arrangements to accompany a different crew, but received permission from both captains involved to go out to Cross Island with the first captain's crew, since the other crews did not foresee going to Cross Island prior to the normative date of September 1. This would have been too long a period of time for potential scouting activity with no researcher present to collect GPS tracks. Thus, the researcher flew to Deadhorse on August 19, and was met and picked up at West Dock by the Napageak crew and transported to Cross Island. Almost as soon as they had arrived on Cross Island, however, the acting captain decided to return to Nuiqsut. A period of from five to seven days of very high winds was predicted, and he thought that his crew would benefit most from waiting out the bad weather back in Nuiqsut. Consequently, the researcher accompanied them back to Nuiqsut, and returned to Cross Island with them on August 25. A second crew went out to Cross Island August 30, and the other two crews September 4. Only limited scouting for whales took place prior to September 5, and no whales were seen prior to September 5 (August 17, 27, 28, 30, and September 4). Most crews left Cross Island September 17. The Napageak crew (and the researcher) left September 18. The researcher was present for all harvest activities, and for all but one scouting trip, in 2004. GPS tracks were collected for all but two scouting trips. The following sections will discuss these features of the 2004 Cross Island whaling season in more detail.

Table 2 summarizes the whales struck by the Cross Island whalers in 2004 (a more detailed day-by-day presentation of daily whaling activity for the entire Cross Island whaling season is presented in Table 5 later in this report). On September 5, the Aqargiun struck and landed a whale. This whaling captain had taken three whales in 2002 for the Nukapigak crew, but had decided to start his own crew in 2003, when he took two whales. The Oyagak crew struck and landed their first whale for 2004 on September 6. They also struck and landed a whale on September 14. The fourth strike was not used.

Three types of data were collected during the 2003 field season, as discussed above. These are GPS information; systematic observations of quantifiable measurements of various components

Table 2: Summary Characteristics[1] of Whales Struck Near Cross Island, 2004

Date	Time Struck	Length	Sex	Whale ID	Miles from Cross Island	Bearing from Cross Island	Notes
9/05/04	8:28 AM	45'7"	F	04N1	9.4	17° true	Aqargiun crew
9/06/04	10:11 AM	33'0"	M	04N2	8.1	30° true	Oyagak crew
9/14/04	2:31 PM	32'3"	M	04N3	11.6	60° true	Oyagak crew

[1]All characteristics are from direct observations or GPS records made on the day of the activity, other than the WhaleID number. WhaleID numbers are assigned by the North Slope Borough Department of Wildlife Management (NSB DW). Times are approximate and are derived from the recorded GPS tracks and/or radio logs, combined with whalers' accounts, as are the distances from Cross Island.

of subsistence whaling activity; and whalers' observations on whale behavior (and especially changes in such behavior). This last sort of information is often accompanied by perceptions of possible causes for such changes and the implications such changes may have for subsistence whaling activities. Each is discussed in an appropriated section below.

GPS Data

All whalers participating in the research in 2004 had participated in the research in previous years. Thus, all crews whaling in 2004 were reasonably familiar with the goals and methods of the project, and in using a GPS unit. All crews had been issued GPS units previous years, but several required an additional unit either because of using an additional boat or the loss of old units. Most new GPS units were Garmin GPS72s, as they have more and better features than the Garmin GPS12 units, although they require another short training session (one whaler did request a replacement GPS12). Whalers were again instructed to record the locations of whale strikes, whale kills, or other subsistence activities or observations. Most boats had at least one crew member familiar with GPS units, and most boats used them as a matter of course. GPS tracks were recovered for most scouting trips (95 percent, for 39 of 41 scouting trips).

All crews were instructed to keep the "tracking" feature on, which recorded the path the boat traveled each time it went out. The two missing tracks were due to this feature being turned off and the researcher not being able to check one crew's GPS units prior to their first day of scouting. As in previous years, tracks were sometimes incomplete or composed of several separate tracks, due to whalers turning the unit off and on, loss of battery power, or the unit losing its positional fix. All boats were provided with a power cord so that the GPS units could be operated from the boat's electrical system, so that depleted batteries were not the problem they had been in previous years, but not all boats could use such cords. Also, all boats were provided with a boat-mounted holder for the GPS unit, so that the units would be readily available, secure, and not be mistakenly shielded from satellite signals due to being put in a pocket. At times satellite coverage was spotty. Whalers were instructed how to mark points, and told to mark the points where whales were seen. Whalers were also asked to mark other events such as "blows," other animals (polar bears, seals, and so on) and key points in their trip (ice in an otherwise iceless trip, place where weather conditions change, and so on). Positions where whales were seen, struck, or killed were marked by a number of crews, but were seldom if ever labeled and so required additional discussion with the crew and additional processing of the "track" file. Fewer points were marked in 2004 than in previous years, but fewer days were spent successfully scouting for whales as well. In any event, the process of increasing the incidence of marking significant points will require steady attention and constant encouragement.

The researcher visited each crew that had gone out for the day after they came back, in order to download the information from their GPS unit into his laptop computer. This ensured that the GPS units were always available to the crews should they decide to go out at short notice. This procedure also enabled the crews to immediately see where they had been that day with the mapping software, and allowed the crew an opportunity to discuss their trip with the researcher while it was very fresh in their minds. The utility of this information, as concretely represented on the mapped tracks displayed by the computer, was immediately obvious to the whalers and appeared to be one reason for the high degree of participation. An example of the combined tracks for one day of scouting can be seen in Figure 2. Figures for all such tracks are included in

electronic appendix A on the CD-ROM attached to this report. The MMS Alaska OCS Region holds the processed GPS data files.

Hunters were also asked to report other subsistence efforts and results, in terms of time spent, species, number, and location in terms of GPS coordinates. Little such activity was reported, but considerably more than in previous years. Polar bears were more numerous, and more troublesome, than in previous years. Walrus were encountered in the area for the first time in the whalers' memories and one adult and one juvenile were harvested (another adult and calf were not deemed suitable for human use). More ducks were available, and harvested, than in previous years. Seals were plentiful, but were not hunted by the whalers.

Daily boat report forms were used to capture the GPS and associated information. The form for the 2004 field season was the same as used for the 2003 field season. Information for all days for all boats are included in Appendix A. Table 3 below presents as example of the information collected for one of the boat tracks included in Figure 2. A change in presentation was made for 2004, in order to reduce the duplication of information, however. In past reports, a separate form was prepared for each boat for each day, regardless of the activity (or inactivity) of that boat. For this 2004 report, a form is completed for a boat only when it is used for a "significant" activity (primarily scouting for whales, but mobilization and demobilazation trips or other activities of note). Those boats for which a separate form is not completed have their activities and status summarized on a single form for all such boats. Thus, for some days each boat will have a separate form. For other days all boats will be included on a single form. Table 4 is an example for a day when no boats went out scouting. For still other days, some boats will have separate forms and a group of other boats will be treated on a single form (if some but not all boats went out scouting). The forms are organized in Appendix A in terms of date rather than by crew as in past reports. Indices to Appendix A are provided by both date and crew to assist the reader in finding specific boat report forms (although the diligent reader could use Table 5 to guide him or her in this task). A list of acronyms and abbreviations used is provided on page ix.

The information used in the Table 3 example was not chosen at random, but rather because it demonstrates some of the difficulties presented in the waypoint information reported in this (and previous) documents. Although instructed to mark waypoints whenever whales are spotted or where significant events take place, no crew in fact can do so, for a variety of reasons. Whaling events happen so quickly that crew members are fully occupied with their duties and sometimes cannot divert their attention to mark a point (or perhaps even remember to do so). When points are marked, crews seldom take the time to assign them names, so that they are designated with "default" numbers. When waypoints are marked, they do not necessarily represent the same thing. Waypoints indicating where a whale was struck or killed for the most part represent the immediate area where that event took place. Those indicating a whale sighting are less precise, showing the position of a boat when a whale was sighted. It may indicate a whale seen a short distance away, or the "blow" of a whale seen in the distance (up to 2 or 3 miles away). Also, a waypoint may represent one whale or multiple whales. On Table 3, for example, "BO1_REF" was not marked by the crew while they were on the water, but was pointed out to the researcher when the track was being reviewed on the computer screen with the crew. There was no information on how many whales "many" referred to, or how far away they were, or what their

Figure 2: Composite Scouting Tracks for a Single Day – 9/14/04

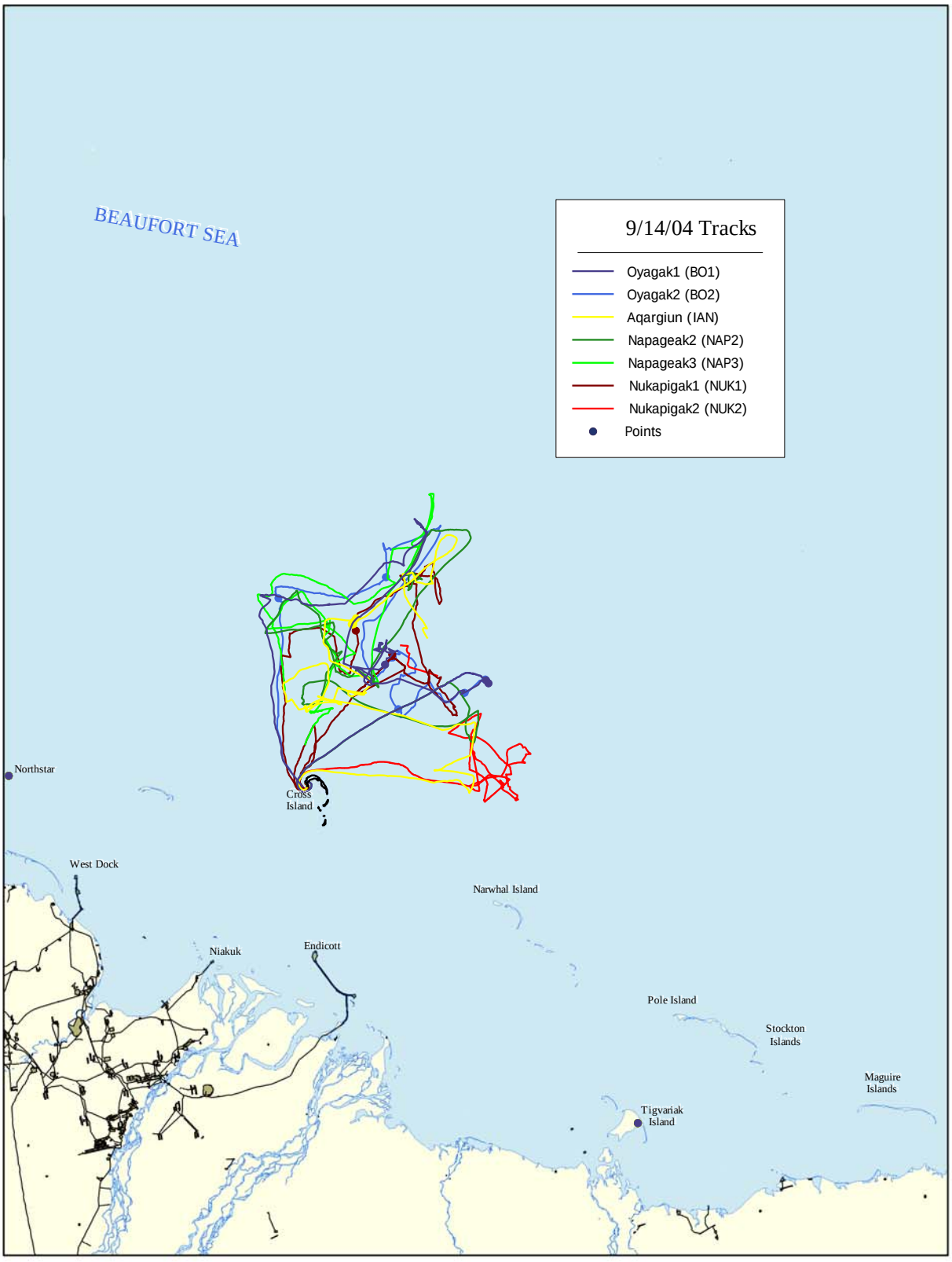


Table 3: Example Daily Boat Report Form

ANIMIDA Task 4 Data Collection Form **Use one form for each vessel/day**

Date: 9/14/04	**Crew:** Oyagak	**GPS Type:** Garmin 72

Vessel	Type	Length	HP Motor	# crew aboard/notes
BO1	Fiberglass	18’	80 Yamaha	4

Whaling today? Yes **If not, why not?**

Time departed: 06:42	**Time returned:** 19:02
12 hours 20 minutes	

Waypoints or Coordinates noted

Lat/Long	Way Point #	Time	Notes (if whale - # of animals, direction of travel, behavior)
N70 34.153 W147 51.919	BO1_REF	11:42	Saw many whales/blows south of this point – 5.9 miles from Cross Island, 26° true2
N70 35.132 W147 47.590	BO1_91404a	11:50	First time they saw the whale they took – 7.8 miles from Cross Island, 34° true
N70 34.237 W147 32.730	BO1_91404b	14:30	Struck the whale – 11.4 miles from Cross Island, 61° true
N70 34.367 W147 33.035	BO1_91404c	14:46	Where whale died – 11.4 miles from Cross Island, 60° true

Describe the day's activity (traveling, hours searching for whales)

Direction of initial search (and explanation):	N
Time spent actively scouting/# people looking:	5 hours 8 minutes scouting, 2 hours 54 minutes chase and kill
Time spent in travel/tow/assistance to other boats/on “break”:	4 hours 16 minute tow

Other notes: Many boats/crews were chasing whales on their own today, since all boats were spotting whales. Boats from the same crew tended to stay closer to each other and to cooperate. BO1 struck and killed a whale fairly quickly, with only the assistance of BO2 and NAP2. Because of the quick kill and the size of the whale, and poor weather to this point, some other boats continue to hunt – NUK2, IAN. NUK1 had returned to Cross Island early with an ailing motor. NAP 3 had a piston burn out and was eventually towed into Cross Island by NUK3.
BO1 headed out north about 10.7 miles, then E and N to a point 15.7 miles from Cross island, and then SW and E to where they saw the whale they eventually took (BO1_91404a). This is the first time they saw a whale on the surface with its mouth open and feeding. They followed one of these whales to the E and found more whales, and struck and killed it. Total round trip of 71.5 miles, furthest distance from Cross Island of 15.4 miles. Male whale, 32’3”, flukes 10’5”, slit 4’0”.

Observations of Whaling Crew - weather, sea state, ice-conditions

Fog or clouds?	sunny	**Atmospheric notes:**	Very calm in the morning, wind increased 3PM and later		
Wind Direction:	E	**Wind speed and other notes:**	0-20 mph, BP 29.88 and rising		
% Ice Coverage:	0	**Ice Type:**	None noted	**Other Notes:**	
Wave Height:	0-2	**Other notes on sea conditions:**	Many areas of glassy water		
Other pertinent notes:					

Note: Cross Island weather station measurements are compiled in a separate file (weather station + observer)

Engaged in any other subsistence activities? No **If yes, describe below**

Polar bears still on the island – not counted and caused no problems this day.

GPS track collected and downloaded? Yes **GPS File Name:** BO1_91404.gdb
If not, why not?

Table 4: Daily Boat Report Form for Non-Scouting Days

ANIMIDA Task 4 Data Collection Form **Use one form for each vessel/day**

Date: 09/09/04	**Crew:** Aqargiun, Oyagak, Napageak	**GPS Type:** NA

Vessel	Type	Length	HP Motor	# crew aboard/notes
BO1	Fiberglass	18’	80 Yamaha	Shorebound – butcher, also weather
BO2	Fiberglass	20’	150 Yamaha	Shorebound – butcher, also weather
BO3	Aluminum	18’	70 Yamaha	Shorebound – butcher, also weather
IAN	Fiberglass	20’	225 Yamaha	Shorebound – butcher, also weather
NAP2	Fiberglass	18’	115 Yamaha	Shorebound – butcher, also weather
NAP3	Aluminum	24’	150 Johnson	Shorebound – butcher, also weather
NUK3	Aluminum	18’	90 Yamaha	To Cross Island from Nuiqsut with 2

Whaling today? No **If not, why not?** These crews stayed in due to weather, and need to process crew shares, and do some other chores. (NUK1 and NUK2 do go out scouting – see NUK reports).

Time departed: NA **Time returned:** NA

Waypoints or Coordinates noted

Lat/Long	Way Point #	Time	Notes (if whale - # of animals, direction of travel, behavior)
None marked			

Describe the day's activity (traveling, hours searching for whales)

Direction of initial search (and explanation):	
Time spent actively scouting/# people looking:	
Time spent in travel/tow/assistance to other boats/on “break”:	

Other notes: No scouting activity for these crews – they stayed in to work on their crew shares and other chores. Conditions not really good for scouting. NAP2 goes to West Dock to pick up 2 crew members and to fill water jugs (conditions too rough to use NAP3). The crew divisions of the two whales taken so far is finally made (delayed due to good conditions for whaling) which is why some crews want to take advantage of the bad conditions to process their shares. IAN and BO crews finish up with theirs. NUK crew does go out scouting briefly (NUK1 and NUK2), and NUK3 comes into Cross Island from Nuiqsut (see NUK reports).

Observations of Whaling Crew - weather, sea state, ice-conditions

Fog or clouds?	sunny	**Atmospheric notes:**	Windy, BP 29.9 and steady, then declines sharply		
Wind Direction:	NW/E	**Wind speed and other notes:**	5-22, NW in morning, shift to E mid-afternoon		
% Ice Coverage:	0	**Ice Type:**	none	**Other Notes:**	Rough for scouting, can travel
Wave Height:	3-6	**Other notes on sea conditions:**	Rough		
Other pertinent notes:	See weather file				

Note: Cross Island weather station measurements are compiled in a separate file (weather station + observer)

Engaged in any other subsistence activities? No **If yes, describe below**

Polar bears active near butcher site. Number not counted – probably at least 5.

GPS track collected and downloaded? NA **GPS File Name:**
If not, why not?

distribution or density was, or any behavioral observations. It is likely that most, if not all, were observed as "blows" and thus seen at a distance. It is likely that they were nearest this area at about 11:42, or just shortly before they marked the whale that they thought was a likely candidate to follow for a possible strike (BO1_91404a at 11:50). They reported that it was this whale that they struck at 14:30 (BO1_91404b) and that died at 14:46 (BO1_91404c). Waypoints were not marked exactly when the strike was made or the whale died, of course, but should closely approximate the locations of these events. For some tracks, there are no waypoints that the crew marked while they were on the water, but quite a few that they could approximate when they later reviewed the track with the researcher (file NAP2_91604.gdb for example). Most of these points represent whale sightings, and are not necessarily any less precise than points marked on the water – but in most cases can be assumed to represent whales or blows seen at a greater distance than for a waypoint actually marked when on the water.

Since most crews will discuss most of their trips with the researcher, it has thus been possible to collect more waypoint information that is present in the GPS data files, but with a potential loss of precision. Crews remember how many whales they have seen on a trip, and generally where they were. When looking at the mapped tracks of their trip they are able to identify where they saw whales, so that an approximate waypoint can be generated. In most cases, sighting locations are associated with changes in a boat's direction. Such "generated" waypoints are differentiated from those actually marked by crews by using lowercase letters in their labels.

Some marked waypoints are also somewhat ambiguous in meaning, however, since the crew may assign one meaning or memory to a point ("strike") when in fact it may have another ("sighting"). That is, especially when whales are harvested, whalers may misidentify the waypoints that they do mark. Given that crew members have little attention to spare in this situation, and that the waypoints themselves are usually only numbered, and that the crew may not remember exactly how many waypoints were marked (or if all attempts to mark points actually succeeded), such confusion can be expected. However, since whalers communicate with each other, the WCC, and sometimes their Cross Island base station, by radio it is often possible to note when significant events take place by what is said on the radio and noting the time. When compared to the date stamps on waypoints these notes can then aid in the interpretation of what the waypoints actually represent. It should also be noted that the researcher is also a potential source of confusion, in that his understanding of a crew's description of their trip activities and events may in fact be in error – the researcher may misinterpret what the crew tells him. The data as presented is the result of comparative cross-checks using the information obtained from all sources (GPS, crew accounts, radio notes).

Ambiguities of meaning influence the way in which the points can be used but not to the extent that they do not have meaning. Whale sighting waypoints can not be interpreted as point locations. Whale strike and kill locations can generally be interpreted as point locations, but not necessarily precise point locations. Boats are always moving and waypoints are seldom if ever marked at the precise time that a strike is made or a whale is killed.

Table 4 represents an attempt to reduce the number of forms to complete for those days when not all boats went out scouting. A separate form was still used to record information for those boats that did go out scouting (NUK1 and NUK2 on 9/09/04), but a single form was used for all the

rest. A rough indication of what else the crews did on those days (and if the boats were used for other purposes than scouting) is noted, but not in detail. Attempts were made to determine if weather, mechanical problems, or other obligations such as butchering was the major factor in a boat not going out scouting on any given day. For some days where multiple factors applied determining which was most important may not be possible.

Systematic Observations

Systematic observations were transferred to standardized recording forms (daily boat report forms). These observations are the basis for the summary tables that appear in the "Results" section, as well as the completed daily vessel activity forms. From these records it is possible to make a basic "census" of the crews on the island, and to track changes as people came to Cross Island and left. In addition, notes were made on which crews went out on each day. In most cases it was possible to note who went out in each boat. From these basic observations can be derived some of the most basic measures of subsistence whaling activity – number of active crews (and boats), size and composition of crews, fluctuations in crew size and composition, and days spent whaling. The GPS data provide systematic locational information for whaling activities. This information also was recorded on the daily boat report forms. Examples of the daily boat report forms appeared above as Tables 3 and 4. The complete series of forms is included electronically as Appendix A. A list of the acronyms and abbreviations used in these tables (and elsewhere in the report) is provided on page ix.

In addition, very basic weather observations were made (temperature, wind direction and strength, degree of fogginess or clarity, barometric pressure). A weather station was installed on Cross Island, with a remote data logger to record the information. The data logger functioned for the period 8/26/04 (2:27 PM) through 9/18/04 (11:04 AM), with readings every five minutes for temperature (outdoor and indoor), wind speed, wind direction, barometric pressure, and relative humidity (file CI2004WF.xls, also included electronically as Appendix B). Any weather observations prior to 8/26/04 (the researcher's first full day on Cross Island) are based on reports from the Napageak crew.

Since January 1, 2001 MMS has maintained a weather station at Endicott, which is close enough to Cross Island to be pertinent. The datalog is available at **www.resdat.com/mms**. This is another potential data set of interest for the analysis of the whaling data (MMS also maintains weather stations at Northstar, Badami, Milne Point, and Cottle Island). Other potential sources of weather information and whaling activities are the communications logs of the Whaling Communications Center. Since the researcher could not go out in the boat while they scouted for whales, he had little ability to judge the degree of ice cover, although the Nuiqsut whalers did report their observations in a general way. There was little or no ice cover in 2004 and the ice edge was known to be far offshore. Ice observations are noted on the daily boat report forms. Historical information on ice cover may be obtainable from remote sensing sources the National Ice Center (http://www.natice.noaa.gov/pub/West_Arctic/beaufort_sea/2004/). The MMS annual aerial bowhead survey is also a potential source of information, but purposely avoids the Cross Island area during the fall whaling season so that it does not affect the hunt.

Whalers' Observations

Whalers would sometimes make observations on whale behavior or give their thoughts on how and why whale behavior in the Cross Island area was different in 2004 than it had been in the past, and especially in 2001 and 2002 (but quite similar to that of 2003). Much of this was recorded in the daily fieldnotes, and is of limited immediate relevance to the central aims of this project. A summary of the most pertinent information is included as the last section of the "Results" section.

Results

Results are discussed in this section in terms of the quantitative observations designed as measures of subsistence whaling activity and the less quantifiable observations and perceptions of Nuiqsut whalers about whale behavior in 2004 as compared to previous years.

Quantitative Measures

The most basic summary of information, extracted from Table 5 and Figure 3, describes the primary characteristics of Cross Island subsistence whaling of most concern for MMS. In 2004, four crews from Nuiqsut whaled from Cross Island. Three crews used two boats each for whaling, and two of these crews each used a third boat for logistical support (one of which went out scouting one day, but was not effective at doing so). The fourth crew used a single boat for whaling. Thus seven boats were used for whaling, and two more for support.

The size and composition of the crews varies from year to year. In 2004 all crews displayed direct kinship relationships among most members (most people in Nuiqsut can trace indirect kinship relationships with most others). There were no female crew members on Cross Island in 2004. All but six crew members were adults, although some were adolescents or young adults. Only two of the sub-adult crew members were younger than high school age. Once all four crews were on Cross Island, the total number of crew members varied from 27 to 32 (or about 7 to 8 per crew). The single-boat crew consisted of three adults – the captain, his wife's brother, and a cousin – and three of the captain's sons (two adolescent and one younger). A fourth son joined the crew on September 4. The multi-boat crews came to Cross Island with five to 9 members. The largest came with seven adults – the captain, two of his sons, one of his nephews, and three more distantly related men – and two children – another son of the captain and a son of the captain's nephew. Another young adult later joined this crew. Another crew came with seven adults – two sons of the captain (one serving as the acting captain), a son-in-law of the captain, two of the captain's grandsons, and two more distantly related men. Another son-in-law and one of his friends later joined this crew. The smallest crew came with five adults – the captain's son-in-law (acting as captain until the captain arrived August 30), his son and one of the captain's sons, and two more distantly related young men. This crew had later additions as well (all adults), as well as some crewmembers leaving, and had nine members at its largest.

Crew Characteristics

All crews had a majority of adult members, but differed in the age of the youngest member and the ratio of older to younger members. One crew had no members younger than the mid- or late-twenties (three or four) and at least four very experienced adults, another crew had three crew members in their early twenties and a high school student and only two or three older adults, another consisted of five or six very experienced adults with two young adults and two younger crew members, and the fourth crew consisted of three experienced adults with two high school students and a younger student. Two of the four crews were composed of more "mature adults" (over the age of 25) than "young adults" (age 18-25) and sub-adults (8-17). One crew was composed about equal numbers of adults and sub-adults, and another of more young adults than "mature" adults. Kinship and kin relations were clearly important for the composition of all four crews, but differed in the way they were expressed in each crew. One crew was composed of more "immediate" family, with in-laws perhaps more important for another, a combination of kinship and friendship relationships important for a third crew, and extended kinship among a group of brothers for the fourth,.

Crews also differed in the number of people who actually manned the boat while whaling (and manned is the proper term on Cross Island, as there were no female Cross Island crew members in 2004. A whaling boat normally requires a minimum of three crew members – a driver, a harpooner, and a person in charge of the float – although boats will sometimes go out with only two crew members. A fourth crew member is sometimes assigned to the shoulder gun. Depending on conditions and intuition, a whaling captain may desire to take as few crew members as possible (to have a light, fast boat) or as many extra as possible (to have as many eyes watching for whales as possible).

In 2004, the boats for two crews always went out with no less than three and no more than five crew members. A third crew sometimes had only two crew members in its boat, but also never had more than five. The single-boat crew never had fewer than six crew members in its boat, and twice went with seven – but only went scouting on three days. It was also generally recognized as the most capable boat at Cross Island in 2004. Mechanical problems and weather conditions complicate any simple explanations for these patterns.

Whaling Days

During the 2004 whaling season there were 12 days when Nuiqsut whalers were documented to go out scouting for whales. One of these days were before the researcher reached Cross Island, but at least a partial track was collected for each day on which scouting occurred. These are the shaded cells in Table 5 – dark cells are those scouting trips for which no GPS track is available, while light cells represent scouting trips for which GPS tracks were collected. Two crews experienced significant mechanical problems in 2004. Of greater significance in terms of limiting opportunities for scouting were weather conditions. Weather prevented scouting activity on five days when boats were out at Cross Island (plus the five days during which the Napageak crew was back in Nuiqsut), and scouting actually took place on three days when conditions were marginal at best. No whales were seen on any of these three days, or on any of the four scouting days when only the Napageak crew went out in August. A fourth day of scouting was cut short when weather conditions deteriorated in the early afternoon. Whales were seen on this day, as

Date	Table 5: Summary of Boat Activity, Cross Island Whaling, 2004 (Page 1 of 2)																Notes
			Napageak[1]				Nukapigak						Oyaguk[2]				
	IAN		Napageak2		Napageak3		Nukapigak1		Nukapigak2		Nukapigak3		Oyaguk1		Oyaguk2		
	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	
8/15/04			To CI w/3		To CI w/2												5 people on CI
8/16/04			Shorebound														5 people on CI
8/17/04			5	9:25	disabled												5 people on CI No whales seen
8/18/04			Shorebound														5 people on CI
8/19/04			To NQT w/6[3]														6 people on CI
8/20/04																	0 people on CI
8/21/04	Still in Nuiqsut		In NQT - weather		Disabled – left on CI												0 people on CI
8/22/04																	0 people on CI
8/23/04																	0 people on CI
8/24/04																	0 people on CI
8/25/04			To CI w/6														6 people on CI
8/26/04			Shorebound		Under repair												6 people on CI
8/27/04			3	3:31	2	3:31											6 people on CI No whales seen
8/28/04			3	17:01	2	11:38[4]											6 people on CI No whales seen
8/29/04			Shorebound		CI to NQT w/2												6 people on CI
8/30/04	To CI w/7		3	4:51	NQT to WD w/2												11 people on CI No whales seen
8/31/04	Shorebound		disabled		WD to CI w/2												13 people on CI
9/01/04	Shorebound		Under repair		Under repair												13 people on CI
9/02/04	Weather		Weather		Weather												13 people on CI
9/03/04	Weather		Weather		Weather												13 people on CI
9/04/04	Weather		3	2:26	3	2:43	To CI w/4		To CI w/3				To CI w/3		To CI w/3		32 people on CI No whales seen
9/05/04	8	7:17	Shorebound		5	7:31	3	UNK	4	UNK			3	5:19	4	5:20	30 people on CI IAN crew lands whale
9/06/04	Finish butcher		Shorebound		3	4:30	3	4:11	disabled				4	6:06	5	6:01	29 people on CI BO crew lands whale
9/07/04	Shorebound Butcher		Shorebound/butcher										Shorebound/butcher				29 people on CI
9/08/04			2	9:25[4]	3	8:12	3	3:20	3	3:00							27 people on CI No whales seen

Table 5: Summary of Boat Activity, Cross Island Whaling, 2004 (Page 2 of 2)

Date	Aqargiun		Napageak[1]				Nukapigak						Oyagak[2]				Notes
	IAN		Napageak2		Napageak3		Nukapigak1		Nukapiagk2		Nukapigak3		Oyagak1		Oyagak2		
	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	Boat Crew	Trip Time	
9/09/04			Shorebound/butcher				4	3:30	3	3:27	To CI w/2						33 people on CI No whales seen
9/10/04	7	5:14	4	8:35	4	8:01	Shorebound		4	7:38	4	5:44	4	5:25	4	5:04	33 people on CI Whales seen, no strike
9/11/04	Weather																33 people on CI
9/12/04																	33 people on CI
9/13/04																	33 people on CI
9/14/04	6	12:58	3	12:53	3	11:07	4	11:37	4	14:10	Shorebound		4	12:20	4	12:13	32 people on CI BO crew lands whale
9/15/04	Cease		Shorebound		disabled		disabled		Disabled				Butcher				32 people on CI
9/16/04	Fire		3	13:08			3	12:17	4	8:46							32 people on CI Whales seen, no strike
9/17/04	To NQT w/7		Packing				To NQT w/		To NQT w/4		To NQT w/4		To NQT w/4		To NQT w/4		31 people on CI
9/18/04			To NQT w/4		To NQT w/2												8 people on CI
9/19/04																	2 people on CI[5]

NOTES

[1]Napageak1 never went to Cross Island, as it was undergoing repair

[2]Oyaguk3 also went to CI on 9/04/05 w/3, but served only as a support vessel and never went scouting for whales.

[3]The sixth crew member had arrived at West Dock on 8/19 and was on Cross Island for only 50-90 minutes before the crew left for Nuiqsut.

[4]Total time for two trips

[5]FWS polar bear researchers arrived on Cross Island 9/14/05 and remained after the whalers left

See text for discussion of other vessel activity, or qualifications on entries above. "Weather" indicates that conditions were deemed by whalers to be too marginal for productive scouting. See discussion ion test. “Shorebound” may also indicate weather, but weather was not given as an explicit reason for not going scouting and other factors may be more primary.

SHADED cells indicate days that boats went scouting for whales. Shading indicates whether a GPS track was obtained:

Travel days (not primarily devoted to scouting for whales) indicated by "To" or "From" with an indication of the number on board.

GPS Track NOT Collected

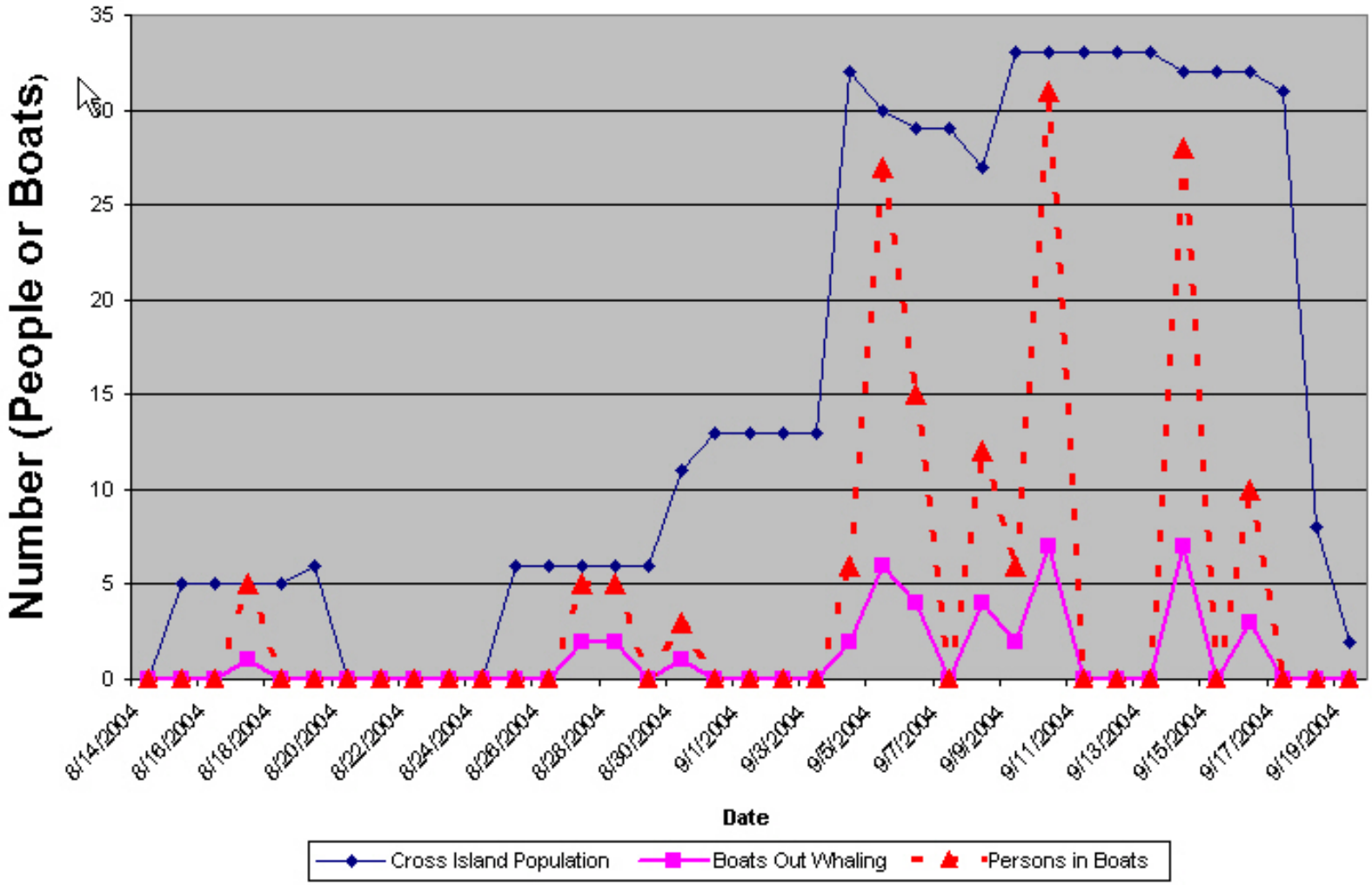
For whale scouting days, "Crew" is the number of people that went out in a given boat. "Trip" is the duration (hours:minutes) for a daily trip.

GPS Track Collected

On days whales harvested, see individual boat daily reports for duration of scouting versus duration of tow.

09/05/04 partial tracks: Napageak1 & Napageak2

Figure 3: Cross Island Population, 2004



Aqargiun Whale, 45’7” – 9/05/04

Oyagak Whale, 33’0” – 9/06/04

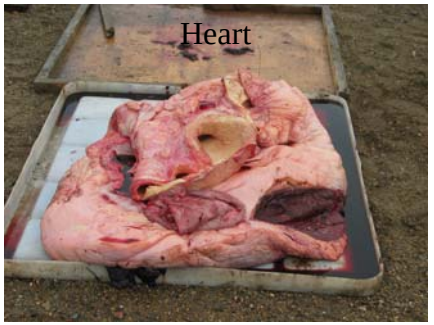
Oyagak Whale, 32’3” – 9/14/04

Muktuk

Whales and Some of Their Products

Tongue

Heart



Butchered Products
Ready for Transport

well as the other four days when boats went out scouting. Whales were taken on three of these four days. Generally, whalers report that the more boats that are out looking for whales, the greater is the chance that they will find them. The 2004 information supports this logical belief, but the weather conditions, mechanical problems, and time of season variables all confound any examination of this question using only the 2004 information. It should be noted that no whales were sighted by Nuiqsut whalers on days when two or fewer boats went out scouting, and that on the days when whales were harvested there were six, four, and seven boats out scouting.

The length of the 2004 Cross Island whaling season is a mater of interpretation. As discussed above, one crew went out much earlier than the other three crews, and in fact returned to Nuiqsut to sit out a period of especially poor weather during the period before the other crews were at Cross Island. All whales were taken during the period when all crews were at Cross Island, and this may be the best measure of the "effective" Cross Island whaling season. This would be a period of 9/04/04-9/18/04, a matter of 16 days. In terms of when the first crew arrived at Cross Island and the last left (8/15/04-9/18/04), the season was 36 days long (with five days when there were no crews on Cross Island). If measured by when there were at least two crews on Cross Island, the season was 8/30/04-9/17/04, or 20 days long. For either the 16- or 20-day season view, there were eight days on which scouting occurred (three of them marginal), a number of days on which weather and/or mechanical problems, and at least two days when butchering or other chores precluded scouting activities. That is, there were five days with good conditions for scouting, with whales taken on three of them. Weather that prevents scouting does not necessarily prevent boats from traveling from Nuiqsut to Cross Island, or from Cross Island to West Dock. Even on days when scouting took place, conditions were quite variable throughout the day and sometimes only a few hours were actually suitable for scouting.

The first whale was taken 9/05/04 (struck about 8:28 AM, killed about 9:45 AM). Even though butchering was not complete by the next day, the successful captain gave his permission for the other crews to go out scouting. The next day (9/06) the other three crews went out and took the second whale (struck about 8:54 AM, but the bomb did not go off; struck again at 10:11 AM with bombs that exploded; killed 11:06 AM). The next day (9/07) was spent butchering. The next two days were marginal for scouting, but on 9/08 four boats went out and on 9/09 two boats went out. No whales were seen on either day. On 9/10, seven boats went out scouting as butchering was complete and one boat had mechanical problems. Many whales were seen, but no strikes were made before conditions deteriorated and the boats had to come in. The next three days, 9/11-9/13, were unsuitable for scouting due to weather conditions. On 9/14, seven boats again went scouting and took the third whale (struck about 2:30 PM, killed 2:46 PM). No scouting took place the next day, as one crew had to butcher their whale, another had called a cease fire, and the boats for the other two crews had engine problems. On 9/16, three boats were able to go out scouting and saw many whales, but were not able to strike any. One whaler had an accident and by the end of the day all crews agreed that the three whales taken would be adequate for the needs of the village and that weather conditions would likely only get worse. They agreed to finish butchering, pack, and leave for Nuiqsut as soon as possible. Three crews left the next day, 9/18. The fourth crew left 9/19. They thus left one strike unused, which went into the AEWC bank of strikes.

In 2004 Scouting for whales occurred on 12 separate days, with a total of 41 boat-days devoted to this activity (each boat scouting for any amount of time on any given day counts as 1 boat-day). Five of these scouting days (a total of 8 boat days) were during the period when only one crew was on Cross Island. This of course potentially directly affects some of the quantitative measures of whaling activity of interest to this project. Previous annual reports treated Cross Island whaling seasons as single entities for purposes of reporting these measures. Because of the unusual behavior of one crew in 2004, these quantitative measures will be reported for three different time periods – the entire whaling season, the "early" season when only one crew was on Cross Island and no whales were sighted (8/15/04-9/04/04), and the "effective" whaling season when all four crews were on Cross Island (9/05/04-9/17/04). These measures are displayed in Table 6.

The most obvious differences between "early season" scouting activity and "effective season" scouting activity is that fewer boats went out scouting on each scouting day in the early season (since fewer were available to go out), boat crew size was smaller in the early season, the length and duration of scouting trips was shorter in the early season, whalers did not go quite as far from Cross Island in the early season, and no whales were struck (or even seen) in the early season. The statistics for the "effective" season and for the entire season compare reasonably well with those from prior years. Which will better represent the season for the purposes of the analytical final report will be discussed in that report.

The numbers from the table will not be recapitulated here, but compare reasonably well with those from 2003. Somewhat fewer boats went out each day (reflecting the mechanical problems in 2004) and boat crews tended to be somewhat larger in 2004. Whales were struck at about the same distance from Cross Island in 2004 as in 2003, while trips were somewhat longer in 2004. Total effort on the water, in terms of boat-hours, was significantly greater in 2004 than in 2003, but still did not approach the totals for 2001 or 2002. These time estimates include as components:

- transit time (at high speed en route to a search area or on the way back to Cross Island)
- scouting time (when actually looking for whales)
- following and chasing time (after finding a whale)
- towing time (after killing a whale)
- other miscellaneous activities (assistance to other boats, mechanical breakdown, rest breaks, and so on).

A detailed breakout of such separate activities is not easily done, although it would be possible through a close analysis of the GPS track information. Rough breakouts could perhaps be compiled with a reasonable level of effort, but more exact accounting (leading to perhaps person-hour levels of effort estimates) would require a high level of effort. As an example, some boats experienced a great deal of engine trouble in 2004, which they attributed to water in the gas. The symptoms were the engine cutting out and having little power, fouling of spark plugs, and water in the fuel injectors (for engines with fuel injectors). Most of these boats did not need the assistance of other boats to return to Cross Island, but did spend a good deal of time working on their engines while on the water. Only detailed interviewing about specific tracks would reveal whether a drifting or slow moving boat was experiencing engine trouble or looking for whales.

Thus, an approximate estimate of "breakdown time" may be possible, but a search for a more exact measure would probably not be cost effective, unless that information would be of extreme usefulness. Similar arguments would apply to the "assistance" or "search and rescue" category. An exception should be noted for the more uncommon case where a boat experiences a problem its crew cannot correct itself. Crews always note when they need to be towed in (or when they tow someone else in). This sort of breakdown has not appeared in the annual reports, but will be attempted in the final report. By any measure, however, the time spent on the water in 2004 was greater than in 2003, but much less than in 2001 or 2002.

Some generalizations about the factors influencing decisions to go whaling are possible, although no systematic model can yet be developed. If the weather is suitable for successful

Table 6: Quantitative Measures of Whaling Effort, 2004 Cross Island Season

Metric		Part of Whaling Season		
Measure	Type	Entire[1]	Early[2]	Effective[3]
# days scouting[4]	count	12	5	7
# days whales seen[5]	count	6	0	6
# boat days[6]	count	41	8	33
Boats scouting/day	average	3.4	1.6	4.7
	median	2.5	2	4
	range	1 to 7	1 to 2	2 to 7
Boat crew size	average	3.6	2.9	3.8
	median	3	3	4
	range	2 to 7	2 to 5	2 to 7
Length of trip (miles)	average	47.8	38.2	50.5
	median	40.3	27.3	43.2
	range	7.8 to 104	7.8 to 104	23.9 to 101
Duration of trip (hours)	average	7.3	6.1	7.6
	median	6.1	3.5	6.8
	range	2.4 to 17	2.4 to 17	3 to 14.2
Furthest point from Cross Island (miles)	average	12.5	11.2	12.9
	median	12.2	10.7	12.6
	range	2 to 24.7	2 to 18.9	7.6 to 24.7
Strike distance from Cross Island (miles)	average	9.7	NA	9.7
	median	9.4		9.5
	range	8.1 to 11.6		8.1 to 11.6
Total Efforts (Hours)		299.4	55.1	244.3

[1]Period of time with at least one crew on Cross Island, 8/15/04-9/19/04 (minus 8/20-8/24)
[2]Period of time with only one crew on Cross Island, 8/15/04-9/04/04 (minus 8/20-8/24)
[3]Period of time with all four crew on Cross Island, 9/05/04-9/18/04
[4]Number of days when at least one boat went out scouting for whales
[5]Number of days when at least one crew saw whales while scouting from a boat
[6]Each boat scouting for whales on any given day counts as one "boat day" – regardless of the duration of the trip or if whales are seen or not. Thus if 2 boats scout on one day and 4 boats scout on the next, the total for the two days would be 6 boat days.

Source: Derived from GPS track information and 2004 field observations

scouting of whales (slight or no wind, slight or no chop, good visibility), all boats physically able to whale will go out. Some captains will go out in more marginal weather than others, and such decisions are quite situational in nature. A crew that has not been out recently seems more likely to go out in marginal weather than those crews that have been out more recently. Crews that have not harvested whales seem more likely to go out whaling than those crews that have landed whales. A captain may call a "rest day" for a crew that has been working hard, especially if conditions are marginal. Trips on days with marginal weather conditions tend to be shorter than on days with better weather. After the harvest of a whale the butchering must reach a well-defined point before whaling can resume. For Nuiqsut whalers this is generally the next day for crews other than that which took the whale, and is often the next day for that crew as well. Crews go whaling in suitable weather and any deviation from that pattern has a specific explanation.

The weather factors that seem to be most directly related to when Nuiqsut whalers scout for whales are barometric pressure and wind speed (and to some extent direction). Barometric pressure changes relatively slowly, and whalers often scout when it is in transition, but good scouting conditions tend to correspond with high barometric pressure or times of transition. Figure 4 displays the barometric pressure at Cross Island for the 2004 whaling season, and the discussion below will relate barometric pressure to scouting activity. Nuiqsut whalers do not observe barometric pressure directly – or, at least did not do so until the start of this research and the appearance of a weather station on Cross Island. If the barometric pressure trend is available, whalers will take it into account when deciding whether to scout for whales or not. Since it is at best a rough predictive tool, however, and whalers know from experience that a (relatively brief – up to several hours) period of good scouting conditions can occur when the wind shifts directions. Nuiqsut whalers thus rely much more on their direct observations of the wind and their experience as to what the future wind conditions will likely be. Whalers prefer days with no wind, and winds up to 5 mph, or even 10 mph, are acceptable. Scouting can occur even with higher winds, given other circumstances. Wind speed for the 2004 Cross Island whaling season are displayed in Figure 5, with wind direction added in Figure 6. The following discussion will show that scouting activities correspond with periods of lower wind speeds. It should be noted that conditions on Cross Island are not necessarily the same as experienced when scouting for whales, but the general trends are often the same (complete weather file in electronic appendix).

During the period of time for which weather measurements are available, scouting occurred on 8/28, 8/29, 8/30, 9/04, 9/05, 9/08, 9/09, 9/14, and 9/16. Whalers themselves admitted that conditions were marginal for scouting on 9/04, 9/08, and 9/09 and that some crews elected to scout on these days only because of the few days of good conditions that they had experienced. Although 9/10 began as a fairly good scouting day and all crews went out, it also turned into a day with conditions too rough to scout. This then defines three groups of days which can perhaps be used to examine the conditions under which Nuiqsut whalers will go scouting for whales:

- Days too rough to scout (days of no scouting activity occurred and afternoon of 9/10 – and especially 9/02-9/03 and 9/11-9/13, periods whalers explicitly said were too bad to go scouting))
- Marginal days for scouting (9/04, 9/08, 9/09, morning of 9/10)
- Good conditions (8/27, 8/28, 8/30, 9/05, 9/06, 9/14, 9/16).

Looking at Figure 4 in terms of these categories, there is a tendency for good scouting days to occur when the barometric pressure is high (8/30, 9/05, 9/06, 9/14, and 9/16) but the trend can be

increasing, stable, or declining. Marginal and poor conditions tend to occur at lower barometric pressures and when the pressure is changing (9/02-03, 9/08-9/13. In terms of wind (Figure 5), good scouting condition days all have low wind speeds (8/27, 8/28, 8/30, 9/05, 9/06, 9/14, 9/16), generally 5 miles per hour or so. Wind direction (Figure 6) seems less significant, especially since at low speeds it tends to be variable. Shifts in wind direction, and changes from variable to unidirectional winds, can be very significant, however. Conversely, poor scouting condition days all had high winds (15 to 35 miles per hour). It should be noted that 9/14, when the third whale was taken, had very good conditions in the morning and only became windier after the whale was killed. As for previous years, wind speed appears to be the singlemost significant factor on whether whalers will go scouting on any given day.

Figure 4: Barometric Pressure at Cross Island, 8/26/04-9/18/04

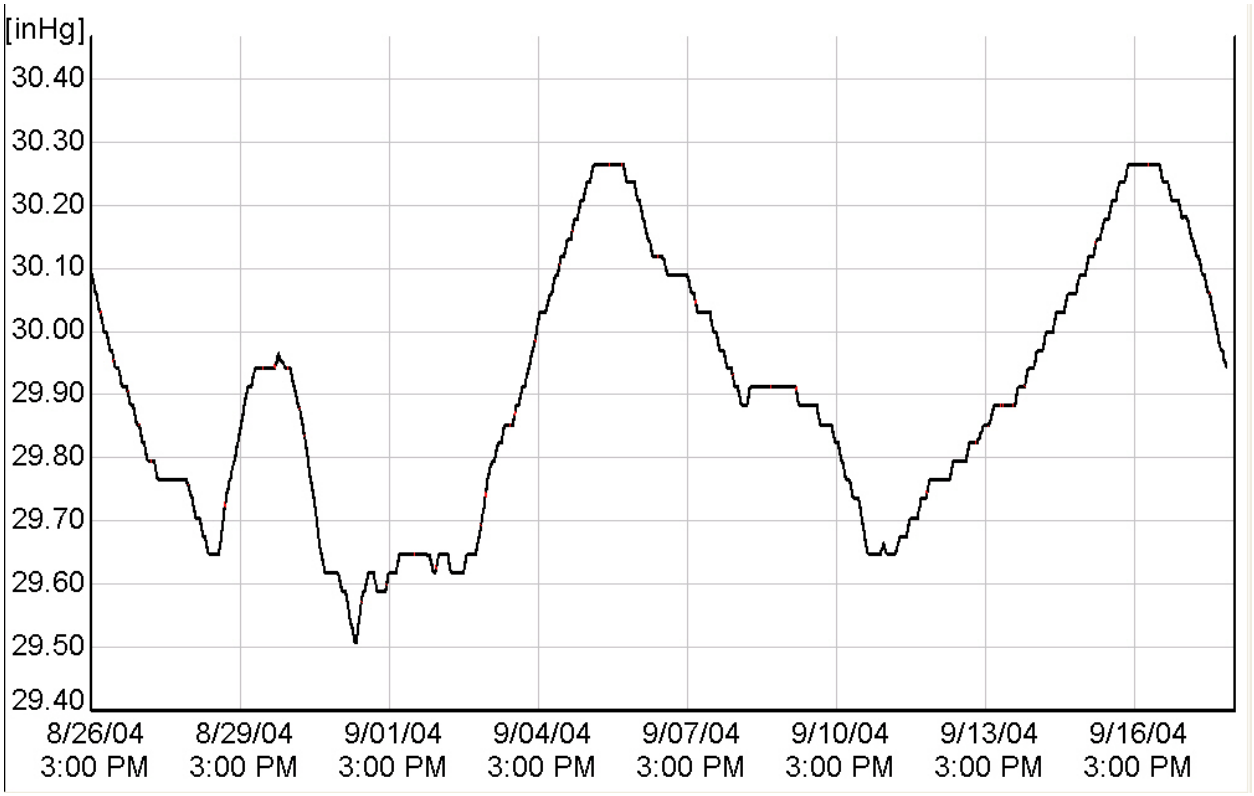


Figure 5: Wind Speed at Cross Island, 8/26/04 – 9/18/04

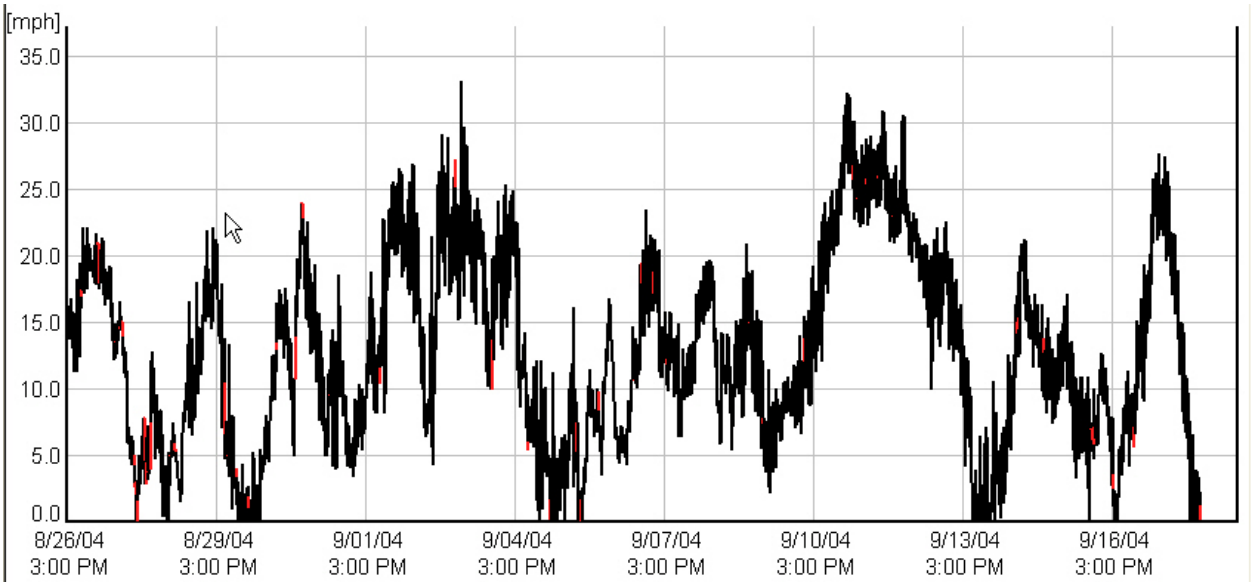
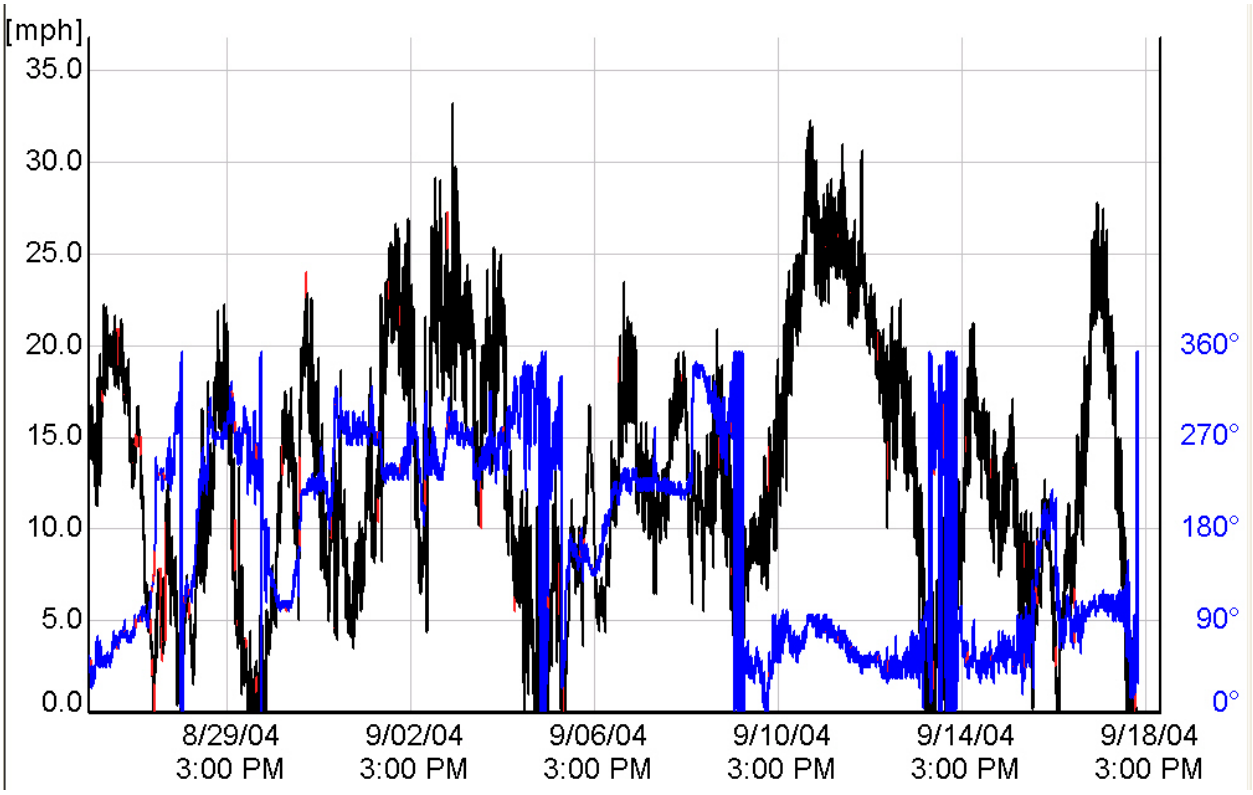


Figure 6: Wind Speed and Direction on Cross Island, 8/26/04-9/18/04



"Non-Whaling" Boat Activity

In addition to searching for whales, several Nuiqsut whaling vessels made trips between Cross Island and West Dock. Most commonly, trips are made for logistical reasons – to pick up supplies, needed parts, or to drop off and pick up crew members. Generally, after the harvest of a whale a certain portion of it is sent to Nuiqsut to "feed the village." In most cases the successful captain will designate one or more of his crew members to take one of his boats to Nuiqsut for this purpose. If conditions for boat travel are poor, the "fresh kill" may be taken to West Dock and flown to Nuiqsut – but will still be accompanied by the captain's flag and a crew member to run the flag to the captain's house.

This information collection effort focuses explicitly on Cross Island whaling activity. No attempt was made to collect information on preparation, support, or other crew member activities that occurred elsewhere (primarily in Nuiqsut). Whaling support activities from non-Nuiqsut sources (mainly oil and gas industry support through Alaska Clean Seas barges) were quite evident, but mainly in terms of island infrastructure rather than the frequency of ACS barge activity. Only two ACS barges landed on Cross Island while the whalers were there – one to bring the FWS polar bear researchers on 9/15 and another the next day to deliver supplies needed by the whalers to pack and transport the whale. Both were after three whales had been taken and the Nuiqsut harvest was complete (although some scouting did occur on two more days). ACS did of course use their barges to mobilize the Cross Island infrastructure on 8/11 (before the first crew arrived) and demobilized this equipment some time after the whalers left. Thus, compared to previous years, there were significantly fewer trips by ACS barges to Cross Island. A helicopter was used to medivac a whaler off the island 9/04, and some gas in drums was delivered by helicopter 9/12. Whalers made fairly frequent trips from Cross Island to West Dock, but these have not been counted or compared to previous years. Documentation of contacts and interactions through telephone, FAX, or non-whaling non-Nuiqsut vessel were not fully documented, and such information was only collected as contextual background.

GPS Information

In terms of GPS locational information, all whaling crews agreed to carry and use GPS units. All track information is presented in the electronic appendices, with Figures 2 in the body of this report as an example. Figure 7 shows a composite of all GPS for all boats for the 2004 whaling season. A list of waypoints noted by the whalers is presented in Table 7. The level of information obtained varied from boat to boat, as discussed above, but for most boats and for all crews at least partial tracking information (where most boats went each day) was obtained, along with the unlabeled points where whales were observed (or struck). In Table 4, as discussed above, the days that boats went out whaling are shaded. Dark shading indicates that a GPS track was not obtained for that day from that boat. Light shading indicates that a GPS track was obtained form that boat for that day. There were 41 different "boat days" for which GPS tracks could have been collected (an increase over 2003, but still less than for 2001 or 2002). GPS tracks were collected for 39 boat days, or 95 percent of all 41 boat days. The 2 "boat days" (5 percent of total boat

Figure 7: Composite of All GPS Tracks for all Boats for All Days, 2004 Cross Island Whaling Season

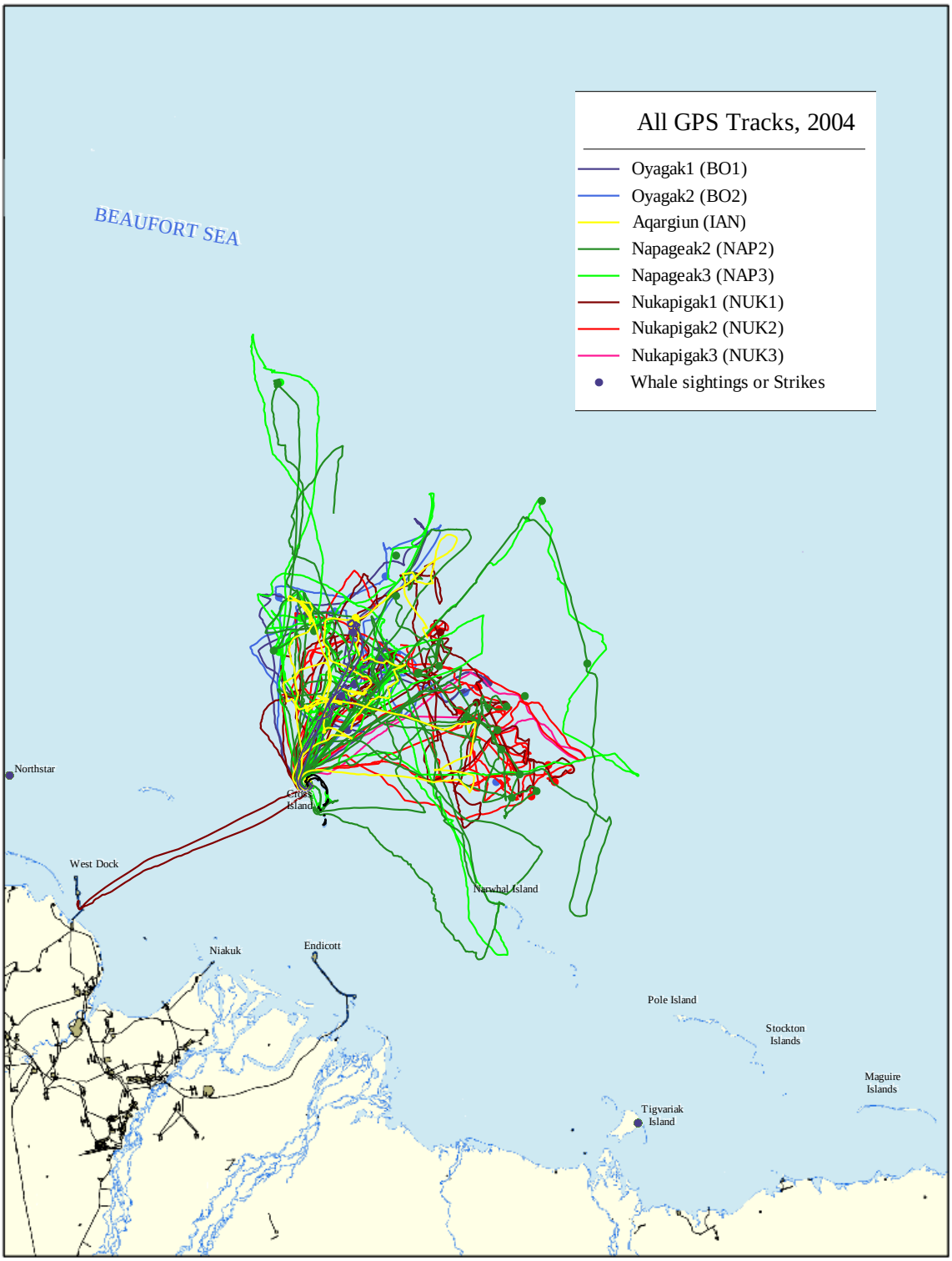


Table 7: Waypoints of 2004Table 5: Waypoints of 2004

Date	Crew	Lat/Long	Way Point #	Time	Notes
8/28/04	Napageak	N70 35.168 W147 18.450	NAP2_82804a	19:39	Area of NAP2 when NAP3 got walrus – 16.8 miles to Cross Island, 67° true
8/28/04	Napageak	N70 42.968 W147 25.037	NAP2_82804b	19:28	Coordinates given by NAP3 for walrus–20.2 miles from Cross Island, 39°
8/28/04	Napageak	N70 42.968 W147 5.037	NAP3_82804a	7:47 PM	Walrus taken in the ice in this area – 20.2 miles from Cross Island, 39° true
9/05/04	Aqargiun	N70 37.173 W147 52.124	IAN_90504a	08:25	Spotted whale and marked location – 9.1 miles from Cross Island, 16° true
9/05/04	Aqargiun	N70 37.337 W147 51.725	IAN_90504b	08:28	Struck whale – 9.3 miles from Cross Island, 16° true
9/05/04	Aqargiun	N70 37.059 W147 52.179	IAN_90504c	09:01	Likely that more bombs put into whale – 9.0 miles, 16° true
9/05/04	Aqargiun	N70 37.055 W147 52.377	IAN_90504d	09:45	Whale killed – 9.0 miles from Cross Island, 15° true
9/05/04	Aqargiun	N70 29.562 W147 58.729	IAN_90504e	13:42	Cross Island
9/05/04	Oyagak	N70 36.645 W147 52.267	BO1_90504a	09:51	BO1 mark for kill site or tow – 8.7 miles from Cross Island, 17° true
9/05/04	Oyagak	N70 36.227 W147 52.242	BO2_90504a	10:33	Point near the start of the tow – 8.2 miles from Cross Island, 18° true
9/06/04	Oyagak	N70 33.063 W147 54.958	bo1_90604x	08:46	First sighting of the whale –4.4 miles from Cross Island, 20° true
9/06/04	Oyagak	N70 33.590 W147 53.887	bo1_90604a	08:54	first strike location (BO1?), float came off – 5.1 miles, 22 ° true
9/06/04	Oyagak	N70 35.392 W147 48.524	BO1_90604b	10:11	second (BO2?) strikes – 6.1 miles from Cross Island, 26° true
9/06/04	Oyagak	N70 34.153 W147 51.920	BO1_90604c	11:06	Kill location – 7.9 miles from Cross Island, 30 ° true
9/06/04	Oyagak	N70 33.590 W147 53.887	BO2_90604a	08:53	First strike (BO1?) – 5.1 miles from Cross Island, 22° true
9/06/04	Oyagak	N70 34.795 W147 47.283	BO2_90604b	10:00	Saw the whale again (after a wait) – 7.6 miles from Cross Island, 36° true
9/06/04	Oyagak	N70 35.292 W147 48.462	BO2_90604c	10:15	Second strike (BO2?) – 7.8 miles from Cross Island, 31° true
9/06/04	Oyagak	N70 34.155 W147 51.917	BO2_90604d	11:06	Kill location – 6.0 miles from Cross Island, 27° true
9/08/04	Nukapigak	N70 33.673 W148 00.716	NUK2_90804a	19:34	A “Moby Dick” blow in this area – 4.9 miles from Cross Island, 352° true
9/10/04	Napageak	N70 32.272 W147 56.116	nap2_91004a	07:41	Whale/blow sighting – 3.3 miles from Cross Island, 18° true
9/10/04	Napageak	N70 36.718 W147 57.808	nap2_91004b	09:19	Whale/blow sighting – 8.4 miles from Cross Island, 2° true
9/10/04	Napageak	N70 48.554 W148 03.098	nap2_91004c	12:22	Whale/blow sighting – 22.2 miles from Cross Island, 356° true
9/10/04	Napageak	N70 35.772 W148 03.583	nap2_91004d	14:02	Whale/blow sighting – 7.5 miles from Cross Island, 346° true
9/10/04	Napageak	N70 32.320 W147 55.869	NAP3_91004a	07:45	Whale/blow sighting – 3.6 miles from Cross Island, 20° true
9/10/04	Napageak	N70 37.316 W147 59.623	NAP3_91004b	08:48	Whale/blow sighting – 9.2 miles from Cross Island, 359° true
9/10/04	Napageak	N70 48.619 W148 02.668	nap3_91004c	12:15	Whale/blow sighting – 22.3 miles from Cross Island, 356° true
9/10/04	Napageak	N70 35.703 W148 02.915	NAP3_91004d	14:01	Whale/blow sighting – 7.4 miles from Cross Island, 348° true
9/10/04	Napageak	N70 36.206 W148 01.400	NAP3_91004e	14:26	Whale/blow sighting – 7.9 miles from Cross Island, 353° true
9/10/04	Nukapigak	N70 32.794 W147 56.700	nuk2_91004a	11:36	Whale sighting – 3.7 miles from Cross Island, 13° true
9/10/04	Nukapigak	N70 32.603 W147 51.277	nuk2_91004b	12:04	Whale sighting – 4.5 miles from Cross Island, 40° true
9/10/04	Oyagak	N70 37.491 W147 58.974	bo1_91004a	09:11	Whale/blow sighting – 9.3 miles from Cross Island, 0° true
9/10/04	Oyagak	N70 32.463 W147 57.332	BO1_91004b	11:19	Whale/blow sighting – 3.5 miles from Cross island, 10° true
9/10/04	Oyagak	N70 31.974 W147 53.033	bo1_91004c	11:50	Whale/blow sighting – 3.7 miles from Cross Island, 38° true
9/10/04	Oyagak	N70 37.901 W147 58.373	BO2_91004a	09:00	Whale/blow sighting – 9.7 miles from Cross Island, 1° true
9/10/04	Oyagak	N70 37.639 W147 54.878	BO2_91004b	9:30	Whale/blow sighting – 9.5 miles from Cross Island, 9 ° true
9/10/04	Oyagak	N70 32.080 W147 56.847	BO2_91004c	11:40	Whale/blow sighting (?) – 3.1 miles from Cross Island, 15° true

Table 7: Waypoints of 2004 (Continued)

Date	Crew	Lat/Long	Way Point #	Time	Notes
9/14/04	Aqargiun	N70 37.173 W147 52.124	IAN_91404a	11:16	9.3 miles from Cross Island, 16° true
9/14/04	Aqargiun	N70 37.337 W147 51.725	IAN_91404b	11:16	9.5 miles from Cross Island, 17° true
9/14/04	Aqargiun	N70 37.059 W147 52.179	IAN_91404c	11:16	9.1 miles from Cross Island, 17° true
9/14/04	Aqargiun	N70 37.055 W147 52.377	IAN_91404d	11:16	9.1 miles from Cross Island, 16° true
9/14/04	Nukapigak	N70 35.611 W147 46.542	NUK1_91404a	06:59	Whale – 8.5 miles from Cross Island, 34° true
9/14/04	Nukapigak	N70 36.756 W147 51.786	NUK1_91404b	11:38	Whale – 8.8 miles from Cross Island, 18° true
9/14/04	Oyagak	N70 34.153 W147 51.919	BO1_REF	NA	Many whales/blows S of this point – 5.9 miles from Cross Island, 26° true
9/14/04	Oyagak	N70 35.132 W147 47.590	BO1_91404a	11:50	First time they saw whale they took – 7.8 miles from Cross Island, 34° true
9/14/04	Oyagak	N70 34.237 W147 32.730	BO1_91404b	14:30	Struck the whale – 11.4 miles from Cross Island, 61° true
9/14/04	Oyagak	N70 34.367 W147 33.035	BO1_91404c	14:46	Where whale died – 11.4 miles from Cross Island, 60° true
9/14/04	Oyagak	N70 38.313 W148 02.872	BO2_91404a	07:49	First whale they saw on this trip – 10.2 miles, 351° true
9/14/04	Oyagak	N70 39.311 W147 47.444	BO2_91404b	09:23	Second whale seen (same one?) – 12.1 miles, 21° true
9/14/04	Oyagak	N70 35.466 W147 46.459	BO2_91404c	12:01	The whale they were chasing – 8.3 miles, 34° true
9/14/04	Oyagak	N70 32.999 W147 45.664	BO2_91404d	13:18	The whale they were chasing – 6.4 miles, 51° true
9/14/04	Oyagak	N70 33.781 W147 36.143	BO2_91404e	14:14	The whale they were chasing – 9.9 miles, 60° true
9/14/04	Oyagak	N70 34.410 W147 33.166	BO2_91404f	14:51	Whale kill location – 11.3 miles from Cross Island, 60° true
9/16/04	Napageak	N70 32.615 W147 35.875	nap2_91604a	15:33	Whale/blow sighting – 9.6 miles from Cross Island, 67° true
9/16/04	Napageak	N70 33.083 W147 30.095	nap2_91604b	10:50	Whale/blow sighting – 11.9 miles from Cross Island, 69° true
9/16/04	Napageak	N70 33.623 W147 27.432	nap2_91604c	10:50	Whale/blow sighting – 13.1 miles from Cross Island, 68° true
9/16/04	Napageak	N70 31.964 W147 31.501	nap2_91604d	15:26	Whale/blow sighting – 11.0 miles from Cross Island, 74° true
9/16/04	Napageak	N70 31.053 W147 30.841	nap2_91604e	15:12	Whale/blow sighting – 11.0 miles from Cross Island, 80° true
9/16/04	Napageak	N70 29.843 W147 28.265	nap2_91604f	15:00	Whale/blow sighting – 11.9 miles from Cross Island, 88° true
9/16/04	Napageak	N70 28.737 W147 29.475	nap2_91604g	14:56	Whale/blow sighting – 11.4 miles from Cross Island, 94° true
9/16/04	Napageak	N70 29.023 W147 25.846	nap2_91604h	13:33	Whale/blow sighting – 12.8 miles from Cross Island, 92° true
9/16/04	Napageak	N70 34.729 W147 42.801	nap2_91604i	18:59	Whale/blow sighting – 8.8 miles from Cross Island, 45° true
9/16/04	Napageak	N70 35.015 W147 39.835	nap2_91604j	19:42	Whale/blow sighting – 9.8 miles from Cross Island, 48° true
9/16/04	Napageak	N70 38.398 W147 46.000	nap2_91604k	20:09	Whale/blow sighting – 11.4 miles from Cross Island, 26° true
9/16/04	Napageak	N70 40.311 W147 46.010	nap2_91604l	20:09	Whale/blow sighting – 13.5 miles from Cross Island, 22° true
9/16/04	Nukapigak	N70 36.636 W147 39.622	NUK1_91604a	12:01	Whale/blow sighting – 11.1 miles from Cross Island, 42° true
9/16/04	Nukapigak	N70 33.307 W147 34.474	NUK1_91604b	15:56	Whale/blow sighting – 10.4 miles from Cross Island, 65° true
9/16/04	Nukapigak	N70 29.466 W147 23.182	NUK2_91604a	10:05	Whale/blow sighting – 13.8 miles from Cross Island, 90° true
9/16/04	Nukapigak	N70 30.325 W147 24.198	NUK2_91604b	10:13	Whale/blow sighting – 13.5 miles from Cross Island, 86° true
9/16/04	Nukapigak	N70 28.815 W147 26.619	NUK2_91604c	10:34	Whale/blow sighting – 12.5 miles from Cross Island, 93° true
9/16/04	Nukapigak	N70 34.046 W147 34.196	NUK2_91604d	11:10	Whale/blow sighting – 10.9 miles from Cross Island, 61° true
9/16/04	Nukapigak	N70 36.908 W147 40.523	NUK2_91604e	12:41	Whale/blow sighting – 11.1 miles from Cross Island, 39° true
9/16/04	Nukapigak	N70 29.648 W147 39.820	NUK2_91604f	14:25	Whale/blow sighting – 7.4 miles from Cross Island, 88° true
9/16/04	Nukapigak	N70 31.782 W147 31.853	NUK2_91604g	15:26	Whale/blow sighting – 10.8 miles from Cross Island, 76° true
9/16/04	Nukapigak	N70 32.901 W147 36.774	NUK2_91604h	15:51	Whale/blow sighting – 9.4 miles from Cross Island, 65° true
9/16/04	Nukapigak	N70 32.953 W147 31.228	NUK2_91604i	16:08	Whale/blow sighting – 11.4 miles from Cross Island, 69° true

days) for which GPS tracks were not collected are accounted for by one crew which had the "tracking" function on their GPS units turned off when they arrived at Cross Island late on 9/04/04. They went out scouting fairly early on 9/05/04 and the researcher was not able to check the settings of their GPS units before this scouting trip. All GPS tracks collected have been transmitted to MMS in Garmin MapSource (*.MPS) format and can be viewed using MapSource or some other standard GIS and mapping software. A composite map showing all tracks collected is included below (Figure 7).

Not all waypoints listed in Table 7 were actually marked by crews while they were out on the water. Some were described by crews during their reviews of GPS tracks. Waypoints that were marked by crews during their trips have labels with capital letters (Thus, not all whale sightings were marked, and not all unmarked whale sightings were later described to the researcher. The daily boat report forms do include some additional likely whale sightings that are not included in Table 6, but these additional points are based on whalers' general accounts, and no specific locational information. It is likely that not all whale sightings are included on the daily report forms, although most individual whales sighted are probably represented. Multiple sightings of the same whale were usually reported as such by most crews, but most crews only marked a single position for a whale unless they followed it for a significant period of time and/or struck it. Different crews marked the position of the same whale, so the number of different whales observed would be difficult to determine without an analysis of all points and tracks in relation to each other.

Waypoints are of three types – whale sightings/strikes, reference points (generally whales seen on previous days or by other boats), and "unknown significance". Whale sightings may have actually been marked by a crew, or may have been located on their track when reviewing it with the researcher at some point. Strike locations are relatively fixed, but sightings may be for a whale or blow located anywhere from 10 feet to several miles from the boat, and thus are less fixed in terms of position. Each waypoint number consists of three parts: BoatID (upper case for points marked while out on the water, lower case for points located while discussing the GPS track with the researcher), Date(mmddyy), and Sequence Number.

Other Subsistence Activities

Little non-whaling subsistence activity was documented on or near Cross Island during the whaling season, but more than in previous seasons. Of course, a great deal of "non-whaling" subsistence activity took place throughout the year in order to support the whaling effort. Whalers did note that they had seen seals and birds, but did not mark these points and generally described such sightings as taking place where ice was encountered (which was not often). Polar bears were first seen on Cross Island 08/25/04 (the day the Napageak crew went out to Cross Island the second time) and it can be presumed were present from that point on. Whalers reported that there were more polar bears on Cross Island in 2004 than in any previous year, and there were more bear/whaler interactions than in previous years. Bears were very close to the cabins several times, and tried to break into at least one. Bears took meat and blubber from the butcher area and the totes in which it was stored repeatedly, and approached the whalers while butchering was going on nearly every day butchering took place. Hazing occurred repeatedly and at least one bear was shot.

An adult walrus was taken 20 miles NE of Cross Island on 8/28/04 and walrus were also seen (and heard) on and around Cross Island for the first time in anyone's memory. One adult female walrus died of natural causes on the Cross Island beach and was disposed of. Her calf was shot, as it could not care for itself without its mother. Another very young walrus that followed the first whale towed to Cross Island was shot a butchered. Ducks congregated in the lagoon in greater numbers than in the past and several crews made duck soup from freshly killed ducks once or twice during their stay. Seals of various sorts were seen quite often, but none were taken for island consumption. No fishing took place while the whalers were on Cross Island.

Nuiqsut Whalers' Observations and Perceptions of Whale Behavior in 2004

Ice conditions in 2004 were even more moderate than in previous years, although the first crew to Cross Island did encounter some floating pans of ice when out scouting, and reported that there was ice on all but the southern side of the island when they first arrived on 8/15/04. Weather again prevented scouting a significant number of days, although perhaps not as high a percentage as in 2003. The lack of ice that could have moderated the effect of the wind was again mentioned as a factor by the whalers. Whalers reported encountering small patches of ice only sporadically. Weather prevented scouting for whales on five to seven (and parts of others) during the "effective" season and ten to twelve for the "entire" season, which was comparable to 2003 and 2002 (but more than in 2001). Thus, while conditions were not as optimal as they had been in 2000, or even as good as in 2001, they may have comparable to those of 2002 and 2003. Level of effort, as measured by time spent out on the water, was about twice that of 2003, but still much less than in 2002 or 2001. In terms of the same factors about which Nuiqsut whalers made observations in previous years:

- Nuiqsut whalers reported seeing plenty of whales when conditions were good for scouting. Once all crews were at Cross Island, whales were observed on all but one day when boats went out scouting. While whalers did not compare one year to another, 2004 was probably comparable to 2003 in terms of whales sighted, and "better" than in 2002 or 2001
- Nuiqsut whalers could find whales relatively close to Cross Island (6 to 8 miles) but could not always follow these whales. Whales could consistently be found within 10 to 20 miles. Whales were harvested about the same distance from Cross Island in 2004 as in 2003, which was considerably closer than in 2001 or 2002. Whalers took shorter trips, both in terms of length and time duration, than in 2002 or 2001, but longer than in 2003 (which is why total effort was greater in 2004 than in 2003).
- No whaler explicitly mentioned observing skittish or "spooky" whale behavior to explain why it was sometimes difficult to follow whales. Possible factors could have been that the whales were traveling more rapidly than in past years. Whales may have also been more difficult to spot, due to wave height. Weather was generally poor and whalers sometimes went scouting in relatively marginal conditions. The season ended with one strike unused.

All whales struck were killed and recovered – none sunk or were otherwise problematic.

Planned Future Activities

As this is written, all products have been completed and delivered for the ANIMIDA program (annual reports for 2001-2003, final report covering 2001-2002). Two field seasons for the cANIMIDA program have been completed. At least one and possibly two field seasons remain under the cANIMIDA contract. This is the final 2004 Annual Report, and the draft 2005 Annual Report is in preparation. For the immediate future, the following tasks will be of most importance:

- The recruitment of a field assistant, or the discussion of alternate means to implement local assumption of the project, is of utmost importance and will take place in conjunction with a trip to Nuiqsut to conduct a training program in the use of GPS units, probably in February 2006. This was requested by the Nuiqsut Whaling Captains Association.
- Completion of the draft 2005 Annual Report (summer 2006);
- Collection of 2006 field data (late August-September) and consultation with Nuiqsut whalers about the 2005 draft Annual Report;
- Finalization of the 2005 Annual Report (October-November).
- Processing of 2006 field data (September-December).
- Follow-up trip to Nuiqsut for project update to whaling captains and community (early 2007).

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Electronic Appendices

Annual Assessment of Subsistence Bowhead Whaling Near Cross Island, 2004 Annual Report (cANIMIDA Task 7) – PDF file "AnRpt2004.pdf"

PDF format file containing all boat report forms for 2004:
"AppendixA.pdf"

PDF format files containing displays of individual and combined whale boat GPS tracks for all days in 2004 on which at least one boat went scouting for whales:
"AppendixB.pdf"

Data Logger file from Cross Island weather station for 2004 in Excel format:
"AppendixC,xls"

Waypoint Table 7 (pages 33-34) in Excel format:
"AppendixD.xls"
This appendix is not included with on the public distribution disk.

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 Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Royalty Management Program** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.