Nuiqsut Caribou Subsistence Monitoring Project: Results of Year 5 Hunter Interviews and Household Harvest Surveys

Prepared for

ConocoPhillips Alaska, Inc.

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EXECUTIVE SUMMARY

This Year 5 report presents the first five years of data for the Nuiqsut Caribou Subsistence Monitoring Project based on research conducted by Stephen R. Braund & Associates (SRB&A) under contract to ConocoPhillips Alaska, Inc. (CPAI). The purpose of the Nuiqsut Caribou Monitoring Project is to document the impacts of CD4 and other CPAI satellite developments on Nuiqsut residents' caribou hunting activities. The monitoring project is an ongoing, multi-year program meant to measure impacts and changes over time. The intent of the project is to assemble data on impacts on caribou subsistence uses in order to work toward a common understanding of these impacts by the community of Nuiqsut, industry, and government oversight agencies. With the assistance of the Kuukpik Subsistence Oversight Panel, Inc. (KSOPI), SRB&A formed a Nuiqsut panel of caribou experts, whose purpose is to assist with developing the monitoring plan, reviewing the results of the monitoring program, suggesting changes to the monitoring program, and identifying active caribou harvesters to interview.

Several types of data are relevant to a common understanding of caribou harvesting impacts: (1) hunter observations; (2) caribou distribution, abundance, herd size, habitat quality; (3) and caribou harvests over time. This fifth annual report is based primarily on hunter observations and a comprehensive household caribou harvest survey.

In November of 2012, SRB&A interviewed 58 residents (57 active harvesters and one Nuiqsut elder who had not hunted during the previous year) regarding their caribou hunting activities over the previous 12 months (November 2011 to October 2012). SRB&A also completed a total of 82 household harvest surveys (83.7 percent of households) in the community of Nuiqsut to document community caribou harvests for the 2012 calendar year. Data from the Year 5 active harvester interviews complement similar data on hunting activities collected for Year 1 (2008), Year 2 (2009), Year 3 (2010), and Year 4 (2011). In addition, the Year 5 household harvest survey data complement harvest data collected by the study team for Year 3 (2010) and Year 4 (2011) in addition to data collected by the NSB and ADF&G in previous years.

Active harvester interview participants identified 211 caribou subsistence use areas and 200 caribou harvest locations for the Year 5 study year, the majority of which were located along the Colville River (including Nigliq Channel and the East Channel) and west of the community toward Fish Creek. The extent of riverine travel was relatively similar during all study years, although in Year 5 use areas extended beyond Umiat at a greater distance than in previous years. In contrast to previous years, active harvesters during Year 5 interviews reported a smaller use area to the east of the community. Year 5 also shows fewer overlaps in the lower half of the East Channel, and the lowest number of overlaps along Fish Creek compared to previous years. Actual harvests of caribou were more concentrated along the East Channel in Year 5 compared to previous study years. Overall, harvest locations during the summer months occurred in similar locations for all five years of the study, with the majority of harvests occurring close to the community and harvests occurring with less frequency with increased distance from the community.

While certain hunting characteristics (e.g., trip frequency, duration, and travel method) have remained similar over the five study years, other characteristics, such as the timing of caribou hunting activities and hunting success within use areas, vary from year to year. A number of factors affect harvest timing and success, including weather and ice conditions, the timing of caribou migration into traditional hunting areas, and outside factors such as industrial or other activities that potentially affect caribou behavior. In Year 5, caribou hunting activities peaked in the month of August. Harvest success in terms of the percentage of successful hunting areas declined between Years 1 and 4 (from 78 percent to 64 percent), but rose slightly in Year 5, with residents reporting successful harvests in 64 percent of their hunting areas.

Caribou harvest amounts have remained relatively stable over time. In Year 5, the community of Nuiqsut harvested an estimated 58,617 pounds of caribou, providing an average of 598 pounds per household, or 147 pounds per capita. Estimated harvests in Year 5 were slightly higher than average. Household uses of caribou were similar to previous years, with 99 percent of households using caribou, and 68 percent of

households attempting harvests of caribou. Rates of sharing were also comparable to previous years, with 79 percent households receiving caribou from other households and 65 percent giving caribou.

The percentages of active harvester respondents reporting changes in hunting area, hunting months, trip frequency, trip duration, and harvest amounts are somewhat similar over all study years. Residents were more likely to report yearly variation in trip frequency and harvest amounts. The percentage of households reporting that they did not harvest enough caribou declined from Year 1 (47 percent) to Year 4 (16 percent). However, in Year 5 this percentage rose to 41 percent. The fact that overall estimated harvests of caribou in Year 5 were comparable to previous years, despite 41 percent of harvesters indicating that they did not harvest enough, suggests that a small group of hunters may be harvesting larger amounts while other hunters may be experiencing decreased success.

The percentage of respondents harvesting caribou with one or more "abnormalities" (e.g., abnormal size, health, or quality) was higher in Year 5 than in the three previous study years (Years 2 through 4), with 45 percent of respondents harvesting abnormal caribou. There was also a corresponding increase in the number of sick caribou reported during the household harvest surveys. The most commonly reported abnormality in Year 5 was a decrease in resource size (i.e., smaller or skinnier caribou) (33 observations) followed by disease/infection (29 observations).

The percentage of harvester respondents reporting one or more Alpine-related impacts on caribou hunting increased in Year 5 after a decline in Year 4. In addition, the number of non-Alpine related impacts increased in Year 5. As in previous years, helicopter traffic was the most commonly cited impact, followed by plane traffic and man-made structures. An increase in impacts between Years 4 and 5 was also observed during the household harvest surveys, with 32 percent of households reporting Alpine-related impacts in 2012 compared to 20 percent in 2011, and 18 percent reporting other impacts in 2012 compared to nine percent in 2011.

In Year 5, the study team also conducted a literature review to compile traditional knowledge quotes and historical accounts related to caribou in the Nuiqsut region over time. In addition, a review of traditional knowledge and historic accounts related to caribou hunting activities in the Colville River delta indicated a shift in how residents describe the availability of caribou over time.

ACKNOWLEDGEMENTS

Stephen R. Braund & Associates (SRB&A) would like to thank the community of Nuiqsut for their cooperation and assistance in completing the first five years of the Nuiqsut Caribou Monitoring Project. In particular, we would like to give a special thanks to the Kuukpik Subsistence Oversight Panel, Inc. (KSOPI) in helping form a Nuiqsut panel of caribou experts (Nuiqsut Caribou Panel), providing space to conduct interviews, and assisting with contacting local residents. We would also like to thank the Nuiqsut Caribou Panel for assisting with the development of the monitoring plan, identifying active caribou harvesters to interview, and making suggestions to improve the program; and the North Slope Borough Department of Wildlife Management for supporting the project. We would also like to thank ConocoPhillips Alaska, Inc. (CPAI) for providing funding and logistical support. Finally, SRB&A would like to thank the 58 Nuiqsut caribou hunters and elders who provided us with the information for Year 5 of this study, and the 82 Nuiqsut households who participated in the Year 5 household harvest surveys.

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ACRONYMS AND ABBREVIATIONS

ABR	ABR Inc.—Environmental Research & Services
ASDP	Alpine Satellite Development Plan
BLM	Bureau of Land Management
CPAI	ConocoPhillips Alaska, Inc.
GIS	Geographic Information System
KSOPI	Kuukpik Subsistence Oversight Panel, Inc.
NSB	North Slope Borough
SPSS	Statistical Package for the Social Sciences
SRB&A	Stephen R. Braund & Associates
USGS	U.S. Geological Survey
WAH	Western Arctic Herd

INTRODUCTION

As a result of the CD4 permit from the North Slope Borough (NSB), ConocoPhillips Alaska, Inc. (CPAI) is required to conduct a study to monitor the impacts of CD4 and other Alpine satellite developments on Nuiqsut subsistence hunting and harvesting activities. In part, the NSB permit reads:

> CPAI shall hire a third party to conduct a subsistence study to better understand and act upon the impacts of the CD4 development and other CPAI satellite developments. The third party contractor shall be selected with the concurrence of the North Slope Borough. The purpose of the study will be to evaluate the short and long term impacts of CD4 and other CPAI satellite developments on the people of Nuiqsut. The scope of the study shall include but is not limited to (a) harvest success by area and species, (b) changes in harvest levels by area and species composition over time, (c) changes in use of subsistence areas and identification of the causes for any changes. The study design shall be forwarded to the North Slope Borough Department of Wildlife Management for review and approval. The contractor will collaborate with the on-going North Slope Borough subsistence harvest documentation study to avoid duplication of efforts, and especially to avoid "burnout" of interviewees. A draft annual report shall be submitted to the North Slope Borough, City of Nuiqsut, Native Village of Nuiqsut, and Kuukpik Corporation for review and comments. The final report shall address any comments made by these parties. The study shall commence no later than November 1 of the winter CPAI begins construction and will continue annually for 10 years. At the end of 5 years, CPAI and the North Slope Borough will discuss the results of the study and determine if the study methods should be adjusted. At the end of 10 years, the third party contractor shall summarize the results and CPAI and the North Slope Borough shall then review the summary and synthesize the results from the study. Based on the study results, CPAI and NSB shall evaluate the need for additional subsistence impact studies. It is intended that the study design will address the possible impacts of CD4 development as well as the additional anticipated CPAI satellite developments proposed for construction prior to 2010.

In response to this requirement, CPAI contracted Stephen R. Braund & Associates (SRB&A) to conduct a caribou subsistence monitoring project in Nuiqsut. The Nuiqsut Caribou Monitoring Project is an ongoing, multi-year project meant to measure impacts on caribou hunting related to CD4 and other Alpine satellite developments. The intent of the project is to assemble data on caribou harvesting activities and impacts on caribou harvesting that lead to a common understanding of these impacts by the community of Nuiqsut, industry, and government oversight agencies. Several types of data are relevant to a common understanding of caribou harvesting impacts: (1) hunter observations; (2) caribou distribution, abundance, herd size, habitat quality; (3) and caribou harvests over time. This fifth annual report is based primarily on hunter observations and household surveys. An important function of the report is to identify additional data monitoring components most relevant to developing a common understanding of these impacts.

This report contains the results of the first five years of hunter information derived from face-to-face interviews conducted in Nuiqsut between March 10, 2009 and April 8, 2009 for Year 1; April 19, 2010 and May 28, 2010 for Year 2; November 9 and 19, 2010 for Year 3; November 14 and 30, 2011 for Year 4, and November 12 and 15, 2012. The report also contains the results of the household caribou harvest surveys conducted between February 2013 and March 2013 for the 2012 calendar year.

STUDY OBJECTIVES

The primary objective of this project is to monitor impacts on Nuiqsut caribou hunting related to CD4 and other Alpine satellite developments and, in doing so, to facilitate and maintain communication between the study team, Nuiqsut residents and organizations, the NSB, and CPAI.

STUDY AREA

The NSB permit to CPAI for development of CD4 stipulates that the subsistence study should consider impacts of the CD4 development as well as other CPAI satellite developments. Impacts related to these developments may occur outside the immediate vicinity of the individual developments. Therefore, for the purposes of this project, the study area includes all areas used for caribou hunting by the community of Nuiqsut. Maps 1, 2, and 3 show place names and oil and gas infrastructure in the study area.

METHODS

In 2009 SRB&A initiated a program to gather yearly information from local Nuiqsut residents about caribou hunting and harvest activities, observations about harvested caribou, changes in caribou, and impacts on caribou hunting. These data are gathered on a yearly basis in order to monitor impacts on caribou hunting related to CD4 and other Alpine satellite developments over time. This section of the report describes the methods used during Year 5 to design and implement the study. Year 5 active harvester interviews gathered information for harvesting activity between November 2011 and October 2012 and household harvest surveys gathered information for the 2012 calendar year (January to December 2012). Interviews, surveys, and meetings for Year 5 took place between November 2012 and March 2013. Thus, the methods describe 2012 and 2013 monitoring program activities, while the results and discussion describe the Year 5 study period caribou harvest amounts, hunting activities, and impacts (spanning from November 2011 to December 2012).

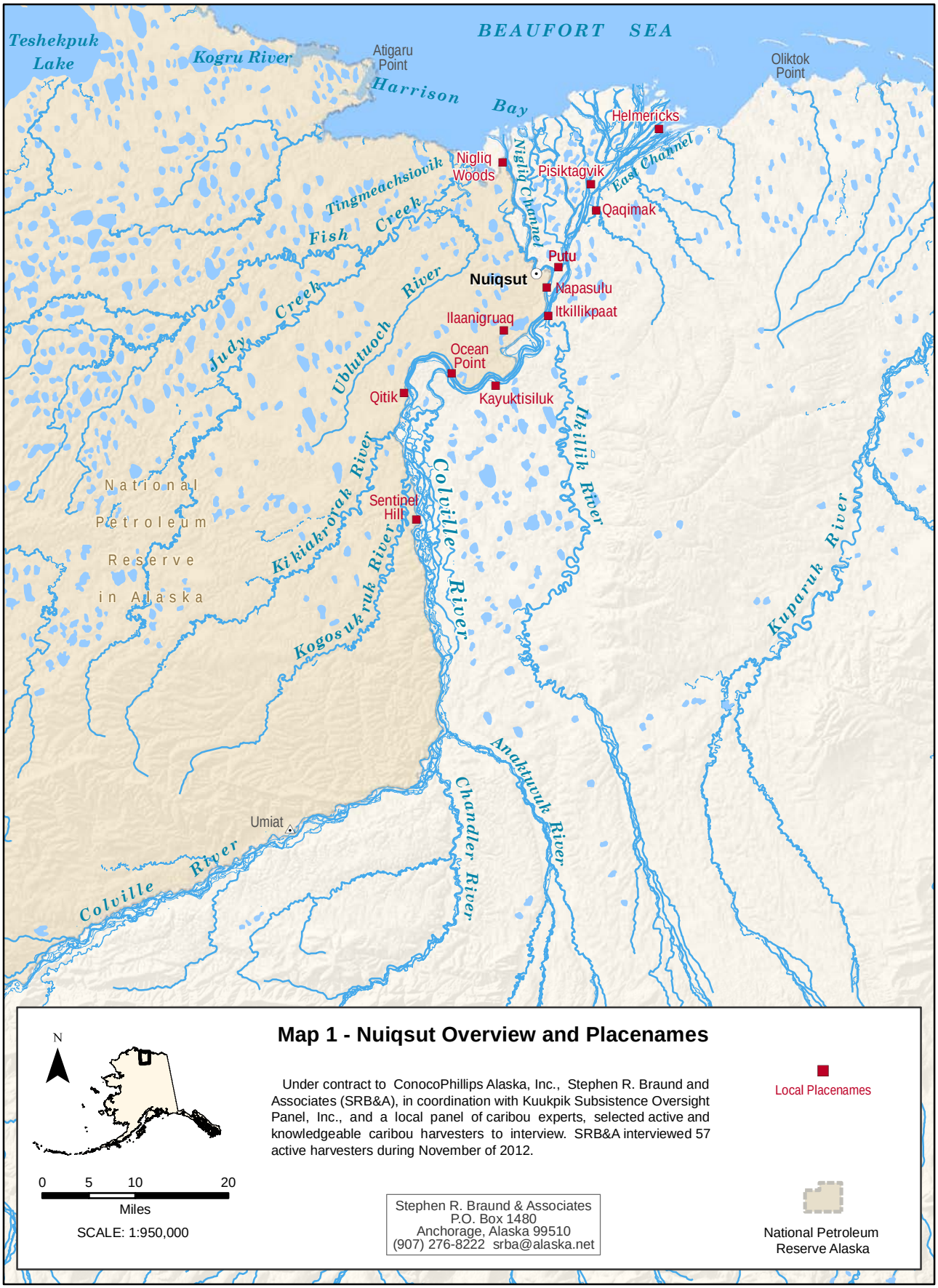
Community Engagement

One of the goals of this project is to promote and facilitate community involvement in the monitoring program. The primary method of facilitating ongoing community involvement for the Year 5 monitoring program was through contact with the Kuukpik Subsistence Oversight Panel, Inc. (KSOPI) and the previously formed Nuiqsut Caribou Panel. SRB&A traveled to Nuiqsut on May 1, 2012 to review the progress and status of the caribou monitoring project. The May 1 meeting was attended by four panel members. During this meeting it was recommended by the panel members that the SRB&A study team return to Nuiqsut at a similar time as the previous year (e.g. November) after the peak of the caribou hunting season, to ask hunters about their caribou hunting activities for the previous 12 months.

SRB&A returned to Nuiqsut on November 12, 2012 and held a meeting with the Nuiqsut Caribou Panel to discuss and coordinate the implementation of Year 5 fieldwork. Eight panel members attended the November 12, 2012 meeting. The following is a summary of the Year 5 meeting with the Nuiqsut Caribou Panel members:

- Several panel members discussed changes they have observed in the caribou within the region and the possibility of meeting with biologists from ABR, Inc. to discuss these observed changes and to ask questions of the biologists regarding the results of their CD4 caribou studies. SRB&A indicated that they would attempt to schedule a workshop or meeting between the harvesters and biologists in early 2013.
- Panel members brought up their interest in extending the Caribou Monitoring Study to include impacts from other development projects in addition to those impacts reported specifically for Alpine, due to the cumulative nature of these impacts. It was recommended that the panel contact the North Slope Borough with any requests to modify the scope of the study.
- Multiple panel members expressed a desire to see additional attention paid to traditional knowledge in future reports. It was suggested that SRB&A incorporate traditional knowledge as documented in previous studies into the Year 5 report.

SRB&A returned to Nuiqsut on February 27, 2013 to conduct the meeting between the Caribou Panel and ABR, Inc. Four panel members were present at the meeting as well as one additional Nuiqsut resident who


BEAUFORT SEA
Teshekpuk Lake
Kogru River
Atigaru Point
Harrison Bay
Oliktok Point
Helmericks
Nigliq Woods
Nigliq Channel
Pisiktagvik
East Channel
Qaqimak
Tingmeachsiovik Creek
Fish Creek
Judy Creek
Ublutuoch River
Putu
Nuiqsut
Napasulu
Itkillikpaat
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Ocean Point
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Map 1 - Nuiqsut Overview and Placenames
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.
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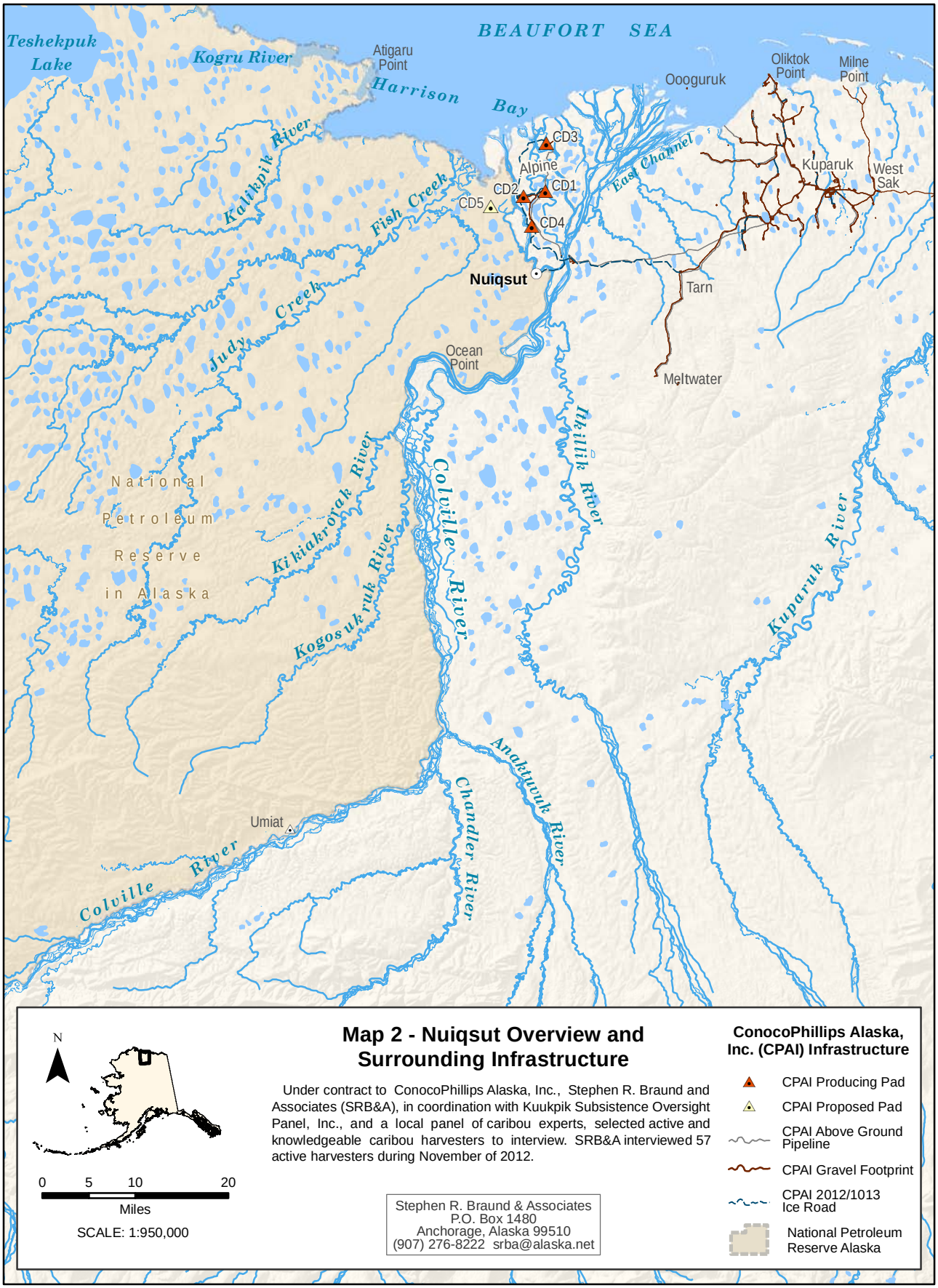
Local Placenames
National Petroleum Reserve Alaska



Map 2 - Nuiqsut Overview and Surrounding Infrastructure

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

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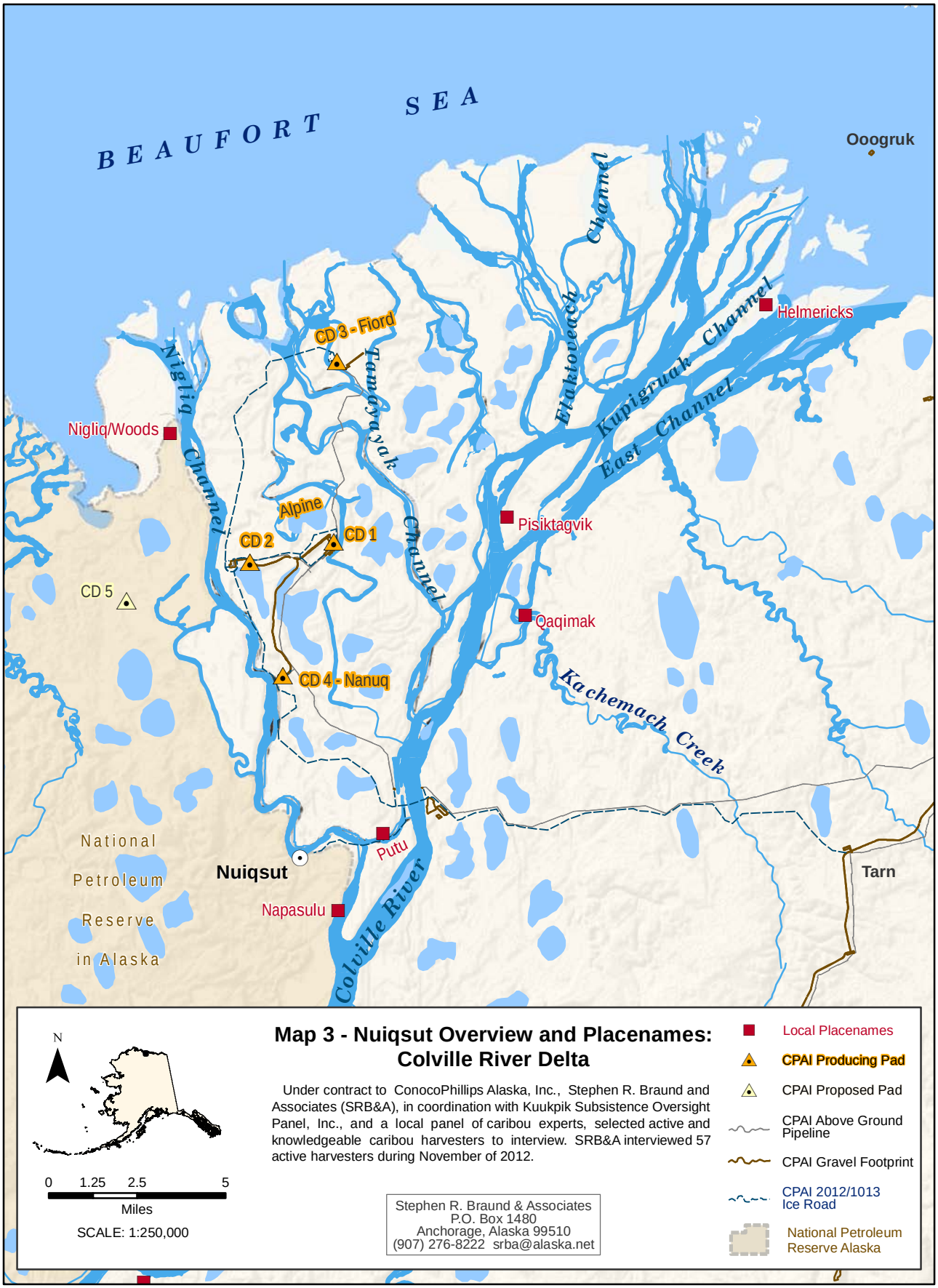
ConocoPhillips Alaska, Inc. (CPAI) Infrastructure

- CPAI Producing Pad
- CPAI Proposed Pad
- CPAI Above Ground Pipeline
- CPAI Gravel Footprint
- CPAI 2012/1013 Ice Road
- National Petroleum Reserve Alaska



Map 3 - Nuiqsut Overview and Placenames: Colville River Delta

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

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was invited by the panel to sit in on the meeting, and two representatives from ABR, Inc. Topics of discussion included:

- Biological monitoring of collared caribou
- Methodology for monitoring caribou herds
- Results of ABR, Inc.'s caribou monitoring studies
- Impact of monitoring studies on subsistence resources (i.e., impact of planes and helicopters used for monitoring on caribou herds and caribou hunters)

Panel members directed a majority of the discussion toward the impacts of scientific studies, particularly surveys conducted by helicopter and plane, on subsistence activities. Panel members attending the meeting requested that ABR, Inc. return again in the future to continue the discussion of impacts on caribou.

Study Design and Field Preparation

At the outset in Year 1 (beginning in 2009), the field effort for the Nuiqsut caribou monitoring program was comprised of annual interviews with a sample of active caribou harvesters in Nuiqsut. Annual household caribou harvest surveys to document yearly caribou harvest amounts were added to the monitoring design in response to suggestions from the Nuiqsut caribou panel during Year 1. These surveys were not completed in Year 2 (see discussion below), but were completed during Year 3, Year 4 and Year 5 data collection (Table 1).

Table 1: Nuiqsut Caribou Subsistence Monitoring Study Components

	Year 1 (2008)	Year 2 (2009)	Year 3 (2010)	Year 4 (2011)	Year 5 (2012)
Active Harvester Interviews	X	X	X	X	X
Household Harvest Surveys			X	X	X
Hunter/Biologist Work Session					X
Incorporation of Additional Sources of Caribou Harvest and Use Area Data			X	X	X
Incorporation of Additional Sources of Traditional Knowledge about Caribou					X

In addition to the field effort, the study team incorporated several other components to the study design, which will provide additional context for measuring impacts. The components include the following:

- Implement work session between hunters and biologists (from Alaska Department of Fish and Game [ADF&G], NSB, or ABR, Inc.) to discuss observations about impacts on caribou.
- Incorporation of additional sources of Nuiqsut caribou harvest and use area data to aid in the comparison of harvests and hunting patterns over time.
- Incorporation of traditional knowledge about caribou from additional sources (provided in Appendix A)

The study team addressed all three of these components during Year 5. During the Nuiqsut Caribou Panel review meeting in February 2014, panel members stressed that they would like SRB&A to incorporate the

results of biological studies, such as ADF&G satellite collar data, into the subsistence monitoring study. The study team plans to incorporate these data into the Year 6 report.

Field protocols and maps for the active harvester interviews and household surveys had been developed during previous study years. The study team updated the active harvester and household survey protocols for Year 5 fieldwork (Appendices B and C). The study team used an informed consent form that guaranteed the confidentiality of respondent information, anonymity of persons interviewed, and the reporting of aggregated data only (see Appendix D).

Active Harvester Interviews

SRB&A used the active harvester interview protocol during annual interviews with Nuiqsut caribou hunters (see Appendix B). The protocol consisted of four sections: 1) Caribou Hunting Activities; 2) Assessment of Harvested Caribou; 3) Impacts on Caribou Hunting; and 4) Additional Observations about Caribou. The protocol was designed to gather information on hunting areas and harvest locations in addition to hunting activity characteristics, assessments of abnormalities in harvested caribou, and observations of personal experiences with impacts on caribou hunting, in addition to general observations about the behavior, distribution, or migration of caribou during the study year. Gathering these data yearly allows for multi-year comparison and monitoring of subsistence use data, resource observations, and impact experiences over time. For Years 1 and 2, the active harvester interviews collected data on the previous calendar year (i.e., January through December). However, because Year 3, Year 4 and Year 5 data collection occurred during the month of November at the request of the Nuiqsut caribou panel, the study team shifted the study period for the active harvester interviews from a calendar year to the previous 12 months (November through October).

The first section of the active harvester interviews (Caribou Hunting Activities) included mapping of Year 5 use areas and harvest locations. Use areas include all of the areas where hunters searched for caribou, even if they were unsuccessful. Harvest locations are the locations where hunters reported a successful harvest and are generally represented by buffered points (rather than polygons). The points are buffered at a one mile radius to account for difficulties with identifying exact harvest locations on a 1:250,000 USGS map. For each hunting area, the study team gathered the following variables:

- Months of use
- Transportation method
- Number of trips
- Duration of trip(s) (including typical duration and longest duration)
- Harvest success (in terms of whether the hunter did or did not harvest caribou in that hunting area in Year 5)
- Location of harvested caribou

In addition, for each harvest location, the study team gathered the following variables:

- Number of caribou harvested by sex
- Month of harvest
- Herd size of harvested caribou[1]

[1] Although not on the original protocol, a Nuiqsut Caribou Panel member requested that this question be added to the active harvester interview during the November 12, 2012 panel meeting. The study team subsequently added herd size as a new variable to the Year 5 active harvester interviews.

The first section of the interview also gathered data about changes related to the above variables (hunting area, number of trips, duration of trips, months, number of caribou harvested, and whether or not an adequate amount of caribou was harvested for the hunters' household).

The second section of the interview (Assessment of Harvested Caribou), gathered data about the following abnormalities in the respondent's harvested caribou in Year 5:

- Abnormal health (e.g., disease/infection/color of meat)
- Abnormal quality (e.g., taste, smell)
- Abnormal size (e.g., fat content or overall size)
- Abnormal quantity of parasites (flies)
- Other abnormalities

Each observation of abnormal caribou was tied to a harvest location on the map. Respondents also indicated whether or not they used the abnormal caribou and reported the number of abnormal caribou by type of abnormality.

The third section of the interview (Impacts on Caribou Hunting) included questions regarding impacts on caribou hunting in Year 5 related to CD4 or other Alpine Satellite developments. If respondents indicated that they had experienced impacts in Year 5, then researchers asked them specifically about the following potential impacts:

- Helicopter traffic
- Plane traffic
- Other traffic (e.g., airboats, trucks)
- Oil company personnel
- Structures blocking hunter access
- Regulations
- Seismic activity
- Other

Finally, the study team asked each respondent if they had observed anything else unusual about the behavior, distribution, or migration of caribou during the study year, and recorded their responses.

Household Caribou Harvest Surveys

The study team added the harvest survey component to the monitoring plan during Year 2 as a result of panel members' concerns that the original study design would not adequately capture overall uses and harvests of caribou by the community of Nuiqsut. However, the study team was not successful implementing the harvest survey until Year 3; and again in Year 4 and Year 5 (see SRB&A 2010a, SRB&A 2011 for a description of the previous efforts to complete the household surveys).

The Year 5 household caribou harvest surveys addressed the 2012 calendar year (January 2012 through December 2012) and consisted of eight questions regarding caribou harvests during the Year 5 study period. Questions in the survey included:

- Did you or anyone in your household use caribou (e.g., harvested, received, or utilized in the home)?
- Did you or anyone in your household try to harvest caribou?
- Did you or anyone in your household successfully harvest caribou?

- How many caribou did your household harvest (only harvested or shot by residents in your household; do not count other households' harvests) in 2012?
- Were any of the caribou harvested by your household sick or injured? Did you use the sick caribou?
- Did you or anyone in your household give caribou to other households?
- Did you or anyone in your household receive caribou from other households?
- Did any Alpine-related activities in 2012 make your household's caribou hunting more difficult?

The study team made several changes to the Year 4 and Year 5 household harvest survey. Because residents had difficulty reporting the number of caribou harvested by month, the study team elected to remove this question from the Year 5 survey. The study team added a question about the number of residents living in the household during the study year; this allowed the study team to produce a per capita harvest estimate. In addition, the study team added a question asking residents whether any of the caribou they harvested were sick or injured and, if so, whether they had used those caribou.

The study team conducted Household Caribou Harvest surveys between February and March 2013. Surveys were conducted by phone from SRB&A's office and in person in the community. SRB&A staff coordinated with KSOPI and traveled to Nuiqsut from February 25 to February 28, 2013 to conduct surveys in the community in order to reach a minimum 80 percent response rate. Upon returning to the office in March, the study team made additional phone calls to conduct surveys with households who had been unavailable during the fieldwork.

Respondent Selection Process

Active Harvester Interviews

In order to collect accurate data for the Year 5 caribou hunting season, it was necessary to interview currently active caribou harvesters. All hunters interviewed in Year 1, Year 2, Year 3 and Year 4 seasons were included in the Year 5 sample. The study team attempted contact with all Year 1 through Year 4 respondents with the goal of achieving consistency between study years. As anticipated, not all Year 1 through Year 4 respondents were available to participate in Year 5 interviews (e.g., absent from the community for the entire field period, medical issues, or had moved to another community) and therefore in order to maintain a similarly sized sample of Nuiqsut caribou harvesters, the study conducted interviews with additional harvesters who had been identified by others as active (but who had not previously participated in the study), or on a walk-in basis.

Walk-in interviews were conducted only after confirming that the individual had hunted caribou during the Year 5 hunting season; interviewers recorded these individuals' names and contact information and agreed to contact them to schedule an interview if time allowed. If the researchers had an opening and had exhausted efforts to schedule interviews with individuals on the list of active harvesters, they often conducted these interviews at that time. The study team found that these "walk-in" respondents were generally active hunters and harvesters who provided informative and thorough interviews.

Household Caribou Harvest Surveys

SRB&A obtained an updated household list from the City of Nuiqsut in 2012, which reported 106 occupied residences within the city limits. The household list provided by the city did not include schoolteacher housing, or vacant TNHA (Tagiugmiullu Nunamiullu Housing Authority) or NSB housing. For the purposes of the Nuiqsut household caribou harvest survey, the study team identified "eligible households" as those that were occupied at the time of the survey, had been occupied during the study year (2012), and were occupied year-round, thereby excluding seasonal workers and teachers who left the community during the summer months. The study team worked with a local liaison to review and finalize the household list. Of the 106 residences provided by the City of Nuiqsut, 6 of the residences were either unoccupied or out of town for an extended period of time and respondents from two of the households had moved making the total number of households eligible for the survey 98. The final household list (98 households) that was

developed by SRB&A and the local liaison using the City of Nuiqsut 2012 household list included all households that were permanently occupied during the 2012 year by Nuiqsut residents and were still occupied during the period in which the survey was implemented.

Interview Process

Active Harvester Interviews

This section describes the interview process for the active harvester interviews. The contents of the active harvester interview are described above under "Study Design and Field Preparation." Researchers generally conducted interviews at the KSOPI office, although some interviews were conducted at the Kuukpik Hotel, where researchers were staying. KSOPI employees assisted the researchers in contacting residents and scheduling interviews. Before the interview began, study team members asked respondents to read and sign the informed consent form (Appendix X).

Two study team members were present for each active harvester interview. One team member conducted the interview and recorded geographic information on an acetate sheet positioned over a 1:250,000 USGS map. The interviewer put registration marks on the clear acetate corresponding to locations on the USGS base maps so that it could later be registered on identical USGS base maps for digitizing. The interviewer recorded geographic data on the acetate, including hunting areas, harvest locations, and impact locations, using color-coded permanent markers and using a different color for each type of data. The second team member took detailed notes using a laptop computer of the responses of the respondents and probes by the interviewer.

Interviewers recorded each mapped feature as a polygon, line, or point on the plastic overlays. Hunting areas and harvest locations are not exact and are based on residents' recollections over the previous year. The study team did not collect data using GPS units. Caribou hunting areas were recorded as polygons, and harvest locations were recorded as points. In most cases, impact locations were recorded as points in order to pinpoint the location where the respondent experienced the impact. SRB&A assigned numbers to each feature as the interview proceeded (e.g., "Polygon 1") and recorded this number next to the feature on the map and in the notes about that feature. This provided a link between the notes and the map and was later used to create distinct feature codes in the Geographic Information System (GIS) and Access databases. In addition to recording data on the acetate and in the laptop, the interviewers also recorded data next to the relevant questions on the field protocol used to guide the interview. The protocol for each interview was later referenced while entering data to ensure the accuracy of the notes.

In five instances, study team members conducted interviews with two respondents at a time, generally hunting partners or family members who traveled to many of the same areas for subsistence purposes. Interviewers used the same overlay for each respondent and used initials to denote respondents' use of an area. If more than one person used the same feature, SRB&A entered and digitized the feature once for each participant. Study team members were careful to distinguish between each respondent's information on the maps and in the notes.

Active harvester interviews generally lasted between 30 minutes and one hour, depending on the respondent's age, experience, activity level, and interview participation. The number of participants in each interview also affected the length of the interview. At the conclusion of the interview, each participant received a $50 honorarium for their participation and time and signed a receipt.

Household Caribou Harvest Surveys

The contents of the household harvest surveys are described above under "Study Design and Field Preparation." Household surveys were conducted by a single interviewer either in person or over the phone. The interviewer explained the purpose of the interview and asked to speak either to a head of household or to an adult who was able to answer questions about the household's caribou harvesting activities during the study year. Surveys generally took less than 10 minutes.

Fieldwork Summary

Active Harvester Interviews

The study team traveled to Nuiqsut one time to conduct Year 5 active harvester interviews in November 2012. As shown in Table 2, SRB&A researchers interviewed 58 Nuiqsut residents (57 active harvesters and one Nuiqsut elder who had not hunted during the previous year). Over the five study years, SRB&A developed a list of 117 active caribou harvesters in Nuiqsut (Table 2), who include all residents interviewed and/or identified as active harvesters during Years 1, 2, 3, 4 and 5. The list of active harvesters has evolved over time and changes from year to year. A number of younger hunters have been added to the harvester list in recent years as they have become more active and proficient hunters. Likewise, some older hunters have indicated that they no longer do the majority of hunting for their household and have recommended that study team interview their children who have taken over these duties. A hunter's level of activity may also vary from year to year based on work or personal commitments, or the hunter's access to a working boat, snowmachine, or four-wheeler. Thus, a hunter may be particularly active in one study year and then less active during the following study year.

Based on reported occupancy during the Year 5 household harvest surveys, the study team estimated the 2012 population for Nuiqsut. SRB&A calculated the estimated community population by multiplying the average reported household size by the total eligible households in 2012 (98 households). This is the same method utilized by the Alaska Department of Fish & Game, Division of Subsistence when calculating population estimates for surveyed communities. The study team estimated the total Nuiqsut population in 2012 to be 400 individuals, similar to the 2010 U.S. Census estimate of 402 (U.S. Census Bureau 2011), but slightly lower than the NSB census estimate of 415 (North Slope Borough 2010). The discrepancies between population estimates may be due to the SRB&A survey not including teacher and other seasonal or non-permanent households.

Table 2: Fieldwork Summary, Year 5

# of Permanent Occupied Households (2012) [1]	Population (2012)[2]	# of Persons Identified as Active Caribou Harvesters	# of Persons Eligible for Interviews	# (%) of Eligible Respondents Interviewed	% of Y5 Respondents Interviewed in All Years	Number of Interview Workshops	Number of Interview Trips to Community
98	400	117	114	58 (51%)	16%	53	1

[1]Based on eligible households identified during the Year 5 household harvest surveys. Does not include schoolteacher housing, or vacant TNHA (Tagiugmiullu Nunamiullu Housing Authority) or NSB housing.

[2]Estimated based on reported household occupants during the Year 5 household harvest surveys. Does not include estimates for schoolteacher housing, NSB housing, or other non-permanent households.

Stephen R. Braund & Associates, 2014.

The study team focused on contacting the 100 individuals who had participated in the study during at least one of the previous four study years. Two individuals were removed from the active harvester list in Year 5; both respondents moved out of the community during 2012. Table 2 depicts the number of persons eligible for interviews in Year 5. A person was not eligible for an interview if he or she did not go caribou hunting during Year 5, if they had moved or were out of town for an extended period of time, or if they had an illness that precluded them from participating in an interview. An exception was made for elders who could provide traditional knowledge about long-term changes. During Year 5, 114 of the 117 active harvesters were eligible for an interview. Of the 100 individuals who had participated in one of the four previous study years (Table 3), 85 active harvesters were eligible for an interview.

SRB&A interviewed 58 individuals, or 51 percent of those eligible for interviews. Sixteen percent (9 persons) of the 58 Year 5 respondents had participated in all five study years (Table 3). Of the 110 respondents who have participated in any of the study years, eight percent participated in all five years, 19

percent participated in four study years, 15 percent in three study years, 26 percent in two study years, and 31 percent have participated in only one study year (Table 3).

Table 3: Respondent Summary, Years 1 – 5

Total Number of Respondents			Number (%) of All Study Respondents Participating in…				
Years 1-3	Years 1-4	Years 1-5	All Study Years	Four Study Years	Three Study Years	Two Study Years	One Study Year
88	100	110	9 (8%)	20 (19%)	16 (15%)	28 (26%)	33 (31%)

Stephen R. Braund & Associates, 2014.

The following tables (Tables 4 through 7) show descriptive data for the Year 1 through Year 5 respondents. In some tables, percentages may add up to less or more than 100 percent (e.g., 99 percent or 101 percent). This is because the percentages are rounded to the nearest whole number, which occasionally results in percentages that do not total 100 percent. In addition, during each study year some interviews were conducted with elders who were no longer active harvesters, or who were not active harvesters during the study year. In this report, tables reporting data collected from active harvesters are based on the active harvester totals, rather than the total number of interviews conducted during each study year. The total number of active harvester interviews in Year 5 was 57 of 58 interviews.

Table 4: Respondents' Residence at Time of Birth

	% of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Nuiqsut	26%	40%	32%	44%	41%
Other North Slope Community	62%	48%	52%	44%	46%
Elsewhere in Alaska	9%	8%	13%	9%	9%
Outside Alaska	3%	4%	4%	2%	4%
Total	100%	100%	100%	100%	100%
Number of Respondents	34	52	56	54	54

Stephen R. Braund & Associates, 2014.

Table 5: Decade Born

	% of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
1940s	6%	10%	0%	2%	4%
1950s	18%	12%	15%	9%	19%
1960s	32%	17%	27%	16%	17%
1970s	21%	17%	16%	18%	11%
1980s	21%	31%	25%	36%	31%
1990s	3%	13%	16%	20%	17%
2000s	0%	0%	0%	0%	2%
Total	100%	100%	100%	100%	100%

Stephen R. Braund & Associates, 2014.

Table 6: Years of Residence in Nuiqsut

	% of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
5 years or less	3%	2%	2%	0%	0%
6-10 years	3%	6%	5%	2%	2%
11-19 years	12%	19%	16%	25%	22%
20 plus years	82%	73%	77%	73%	76%
Total	100%	100%	100%	100%	100%

Stephen R. Braund & Associates, 2014.

Table 7: Respondent Gender

	% of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Female	3%	8%	4%	5%	7%
Male	97%	92%	96%	95%	93%
Total	100%	100%	100%	100%	100%

Stephen R. Braund & Associates, 2014.

During all five study years, over 80 percent of respondents were born on the North Slope (Table 4). The distribution of decades in which respondents were born remained fairly consistent in Year 5 compared to Year 4 (Table 5). The percentage of respondents born in the 1990s has risen over the five study years, ranging from three percent in Year 1 to 17 percent in Year 5; this reflects the emergence of younger hunters born during this time frame who are increasingly considered active harvesters in the community as they gain more experience. For the first time in Year 5, one respondent reported being born in the twenty-first century. This respondent was an active harvester during the study year and participated in an interview with his father. He was able to identify the locations where he shot caribou while on hunting trips with his father and provided observations about their hunting activities during that year.

As the percentage of harvesters born in the 1980s and 1990s increased, the percentage of respondents born in Nuiqsut stayed within the range of the previous four study years. The large majority (82 percent in Year 1, 73 percent in Year 2, 77 percent in Year 3, 73 percent in Year 4, and 76 percent in Year 5) of respondents have resided in Nuiqsut for 20 or more years (Table 6). The majority of active harvester respondents have been male for all study years (Table 7).

As stated above, the study team attempted to interview respondents from previous study years again in Year 5, with a focus on respondents who have participated in multiple study years or have been highly recommended as active harvesters. The Year 5 sample included ten respondents not interviewed in a previous study year. Differences in the makeup of the five samples could potentially account for observed differences in results between the five years. In Year 3, to test for sample-related differences, results for 15 principal variables were compared for the entire sample for each year and the subsample of 18 respondents interviewed in all three study years. The pattern of results for the entire sample was similar in the subsample. This indicates that the results shown for the entire sample in each year are representative and comparable across years.

Household Caribou Harvest Surveys

As noted above (Respondent Selection Process), households considered eligible for the household caribou harvest surveys were those that were permanently occupied during the 2012 year by Nuiqsut residents and were still occupied during the period in which the survey was implemented. SRB&A identified 98 eligible

households for the 2012 study year. The study team aimed to achieve a minimum response rate of 80 percent (78.4 households) in order to provide a representative sample of the community that could be expanded to estimate for the community as a whole. SRB&A completed a total of 82 (83.7 percent) household surveys in the community of Nuiqsut (Table 8). Of the households not surveyed, four declined to participate, and the remaining 12 households were otherwise unavailable.

Table 8: Nuiqsut List of Occupied Households, 2012

Type of Household	Number of Households
Original Household List	106
Unoccupied	6
Residents Moved	2
Total Eligible Households	**98**
Surveyed Households (% of Eligible Households)	**82(83.7%)**

Stephen R. Braund & Associates, 2014.

Post-field Data Processing

Editing Notes and Overlays

After completing fieldwork in Nuiqsut, study team members edited the acetate overlays and notes for each interview. Researchers checked the overlays to ensure that they were readable and that all features had been numbered correctly without duplications and that the feature numbers were consistent with the information in the notes. For example, if a map contained 42 polygons, 10 lines, and 5 points, SRB&A ensured that none of these had accidentally been repeated in the field (e.g., two "Polygon 8" features). Study team members then wrote the total number of features on the corner of the overlay to assist digitizers. Researchers proofread interview notes for typing errors, legibility and accuracy.

Data Entry

After editing the notes and overlays, researchers entered all of the data from the interview, including the features on each overlay, into an Access database created by the study team. Each geographic feature received a unique feature code, which matched the feature code in the GIS database (see below under "GIS File Preparation"). Each feature code included the community code, respondent ID, interview date, shape type (e.g., polygon, line, or point), and shape number. Data for each section of the interview were entered as records in separate tables. The Access Database included the following data tables:

- Respondent Table – This table contains each individual's Respondent ID, interview date, birth residence, birth date, gender, and years of residence.
- Harvest Area Table – This table contains one record per hunting area collected in Section A of the field protocol ("Caribou Hunting Activities"), in addition to variables (months, transportation method, number of trips, and duration of trips) for each of those features. Each record also includes the unique feature code assigned to that feature.
- Harvest Location Table – This table contains one record per harvest location collected in Section A of the field protocol ("Caribou Hunting Activities"), in addition to the number harvested and month of harvest for each of those features. Each record also includes the unique feature code assigned to that feature.

- Harvest Activity Assessment Table – This table contains one record per respondent and includes their responses regarding changes to their hunting activities (e.g., hunting area, trip frequency, trip duration, hunting months, and harvest amount) as collected in Section A of the field protocol. The study team coded each response so that the data could later be queried.
- Harvested Caribou Assessment Table – This table contains one record per abnormal caribou reported by respondents, as collected in Section B of the field protocol ("Assessment of Harvested Caribou"). The study team coded each response so that the data could later be queried based on type of abnormality.
- Hunting Impact Table – This table contains one record per impact observation, as collected in Section C of the field protocol ("Impacts on Caribou Hunting"), in addition to the month of impact, associated feature codes, descriptions of the impact, and descriptions of suggested mitigation to lessen the impacts.

The resulting database contains six data sets. The number of records in each data set for the five study years is shown in Table 9. After completion of data entry, SRB&A performed a Quality Control check of all data previously entered. This consisted of a detailed review of maps, notes, and database records and resulted in all data entry being checked for accuracy.

Table 9: Nuiqsut Datasets

Nuiqsut Dataset Component	# of Records				
	Year 1	Year 2	Year 3	Year 4	Year 5
Active harvester respondent characteristics (age, residence duration, place of birth)	36	53	57	58	58
Subsistence use areas	137	187	215	194	211
Harvest locations	182	160	199	166	195
Observations of changes in harvest patterns	36	53	57	58	56
Observations of changes in condition of caribou	58	61	66	68	83
Impacts on harvest activities	111	109	81	72	102
Number of Respondents	36	53	57	58	58

Stephen R. Braund & Associates, 2014

For the Harvest Activity Assessment and Harvested Caribou Assessment tables, the study team assigned numeric codes to each observed change or observed abnormality and to respondents' explanations as to why each observed change or abnormality occurred. Coding of these variables allowed the study team to develop tables with frequencies of respondent observations. Appendix E provides codes used in the Year 5 Access database, with examples of the types of responses each code encompasses. The study team conducted a quality control check of the codes to ensure consistency.

Digitizing

To facilitate digitizing, SRB&A first had all the acetate overlays scanned. This step permitted multiple staff to complete the digitizing process by editing scanned images. All digitizing was done using ArcGIS ArcEdit software. Digitized features included polygons associated with subsistence use areas and impact areas; lines associated impacts and other data; and points associated with harvest locations and impact locations. Altogether, SRB&A digitized 211 Year 5 use areas and 195 Year 5 harvest locations. SRB&A checked all digitized records against acetate maps for accuracy and conducted a Quality Control check of each digitized record. Each GIS record was assigned a unique Feature Code.

Analytic File Preparation

The Access Database resulting from entry of field data consists of six related tables, which are described above ("Data Entry"): (1) Respondent; (2) Harvest Area; (3) Harvest Location; (4) Harvest Activity Assessment; (5) Harvested Caribou Assessment and (6) Hunting Impact. SRB&A used Stat Transfer to convert Access tables for analysis with the Statistical Package for the Social Sciences (SPSS). SRB&A created reports within Access to compile quotes for inclusion in this report.

GIS File Preparation

The relevant tables from the Access database were linked to the GIS database so that GIS staff could develop maps querying specific feature information. The SRB&A GIS mapping system consists of three possible methods of presenting mapped information. The first method is represented by Map 4 and is referred to as a "spaghetti map." The spaghetti map as shown is made up of vectors (e.g., a point, line or polygon) and represents overlaying all of the individual respondent outlines of Year 5 caribou hunting areas. Typically, this representation is not used in map production as it presents individual data (e.g., individual polygons). The second method uses a single polygon to depict the extent of subsistence use areas for all respondents, as seen in Map 5. Researchers often use this method to represent subsistence use areas on maps. While this single polygon approach clearly shows the extent of the use area, it does not differentiate between areas that are used by one person from those that are used by multiple persons. In the third method (Map 6), SRB&A converts polygons (use areas) to a grid with each pixel being assigned a value of one. Then, the number of overlapping pixels are summed and assigned a color, with the darkest color representing the highest density (or number) of overlapping pixels. This method is the primary one SRB&A used to depict use areas and other variables in this report and can be seen below, under "Location of Caribou Use Areas."

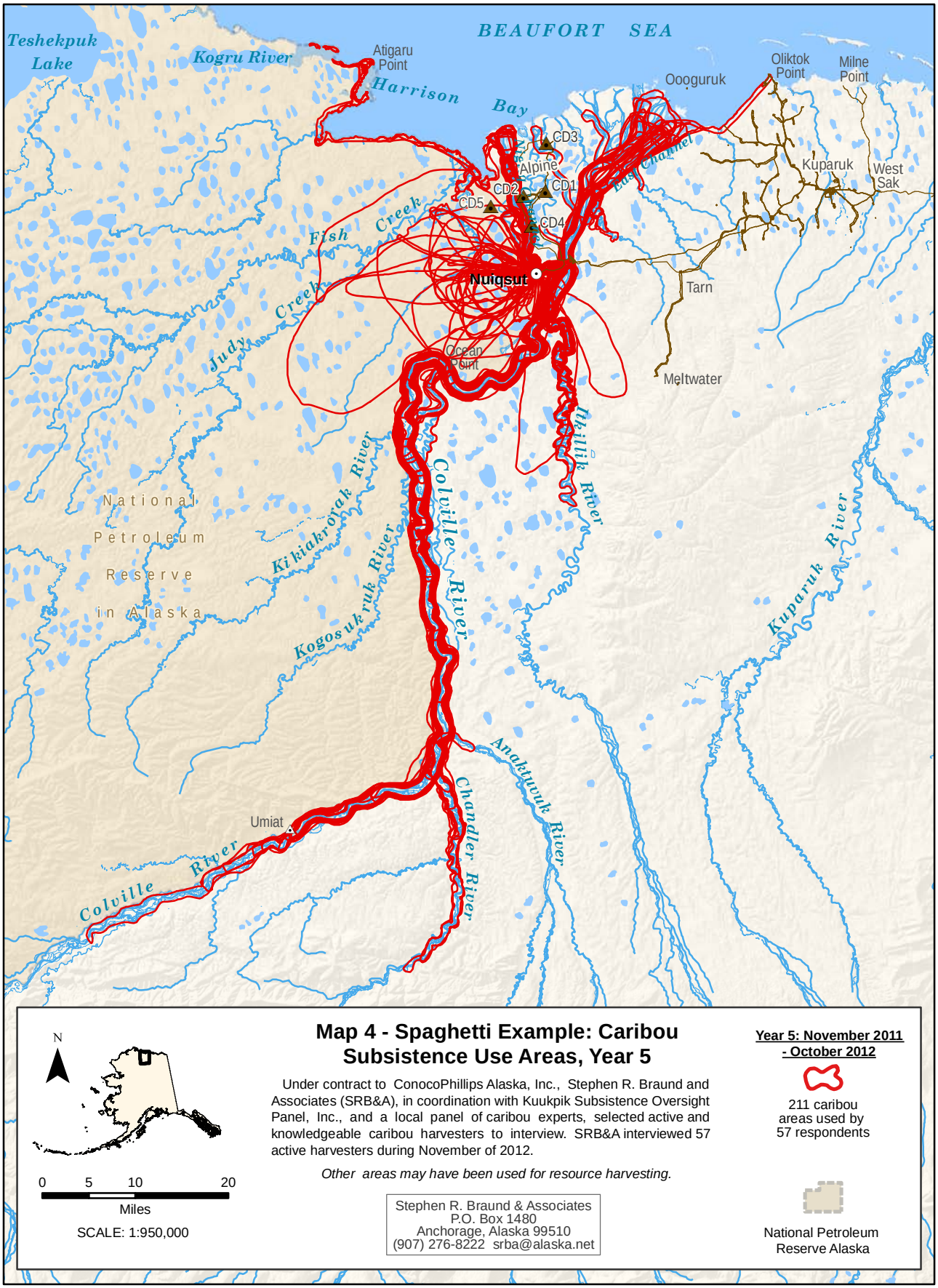
Household Harvest Survey Data Analysis

Similar to the data analysis steps for the active harvester interviews, the study team entered the data from each household harvest survey form into an Access database developed by the study team, and used Stat Transfer to convert the Access tables to SPSS for analysis. To create a community harvest estimate based on the results of the household surveys, the study team multiplied the sum of all reported caribou harvests by a weighting factor. The weighting factor was computed by dividing the total number of eligible households for the study year (98) by the number of sampled households (82). The study team operated under the assumption that the 16 households who did not participate in the household survey were not substantially more active or less active (in terms of caribou harvesting) than the community as a whole.

To determine the total pounds of caribou harvested, the study team used a conversion factor of 117 pounds per caribou. The study team chose this conversion factor because it was the one most recently used by ADF&G for the North Slope in Braem et al. (2011). For the purposes of the Year 5 report, the study team retained the conversion rate of 117 pounds per caribou to retain comparability with previous harvest estimates for the community.

Data Review

The study team submitted a draft of the Year 5 report to CPAI in February 2014. A draft review meeting was held with the Nuiqsut Caribou Panel on February 13, 2014, where panel members received a summary handout and presentation of Year 5 findings. The comments made by the Nuiqsut Caribou Panel during that meeting were incorporated into the Year 5 report. On March 13, 2014, two SRB&A staff traveled to Barrow to present the results of the Year 5 study to the NSB. The study team revised the Year 5 report multiple times based on CPAI and NSB review. In July 2014, the study team prepared a final draft report and sent it to the Nuiqsut Caribou Panel for final review.



Map 4 - Spaghetti Example: Caribou Subsistence Use Areas, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

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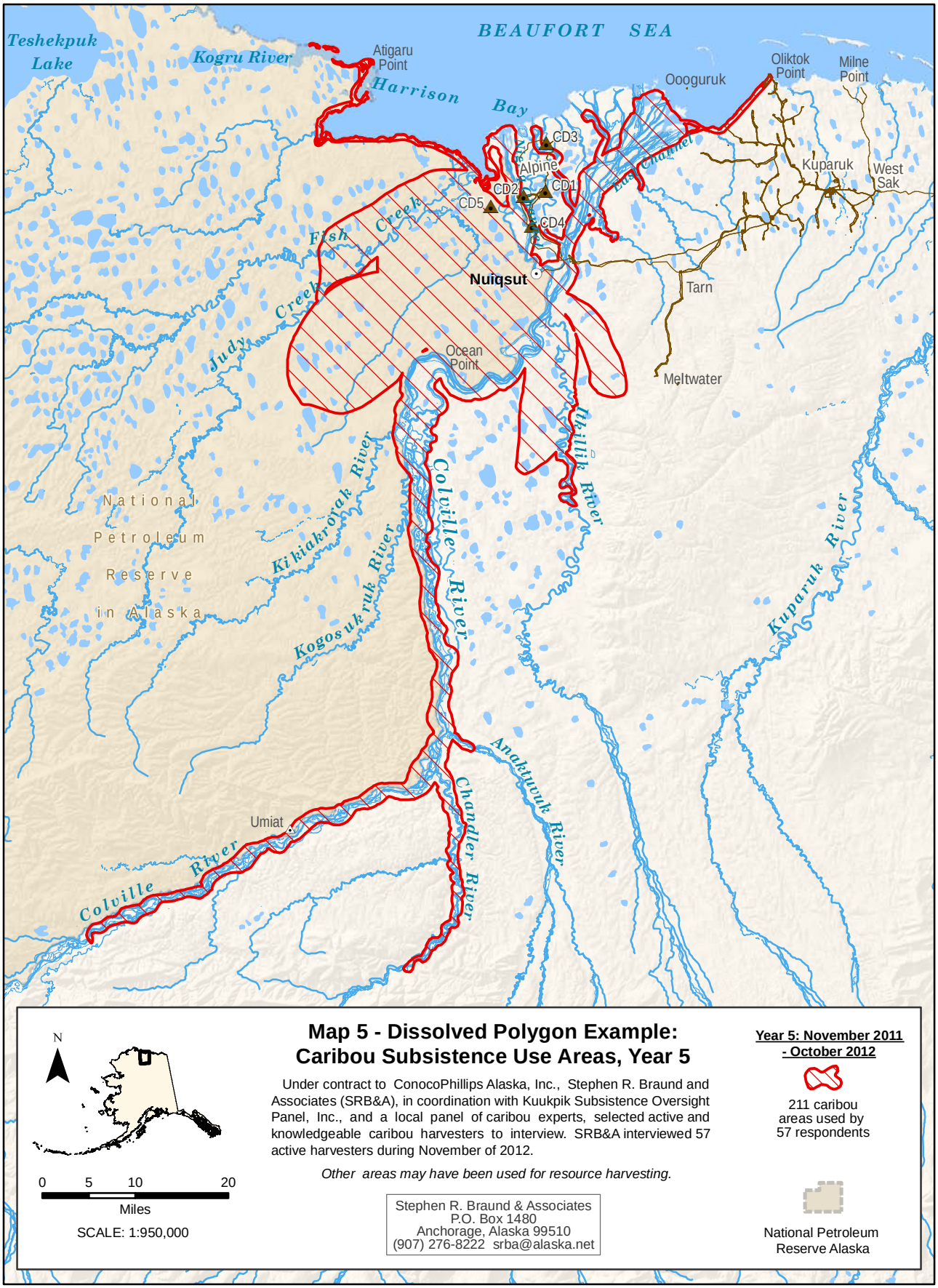
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

Year 5: November 2011 - October 2012

211 caribou areas used by 57 respondents

National Petroleum Reserve Alaska



Map 5 - Dissolved Polygon Example: Caribou Subsistence Use Areas, Year 5

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Other areas may have been used for resource harvesting.

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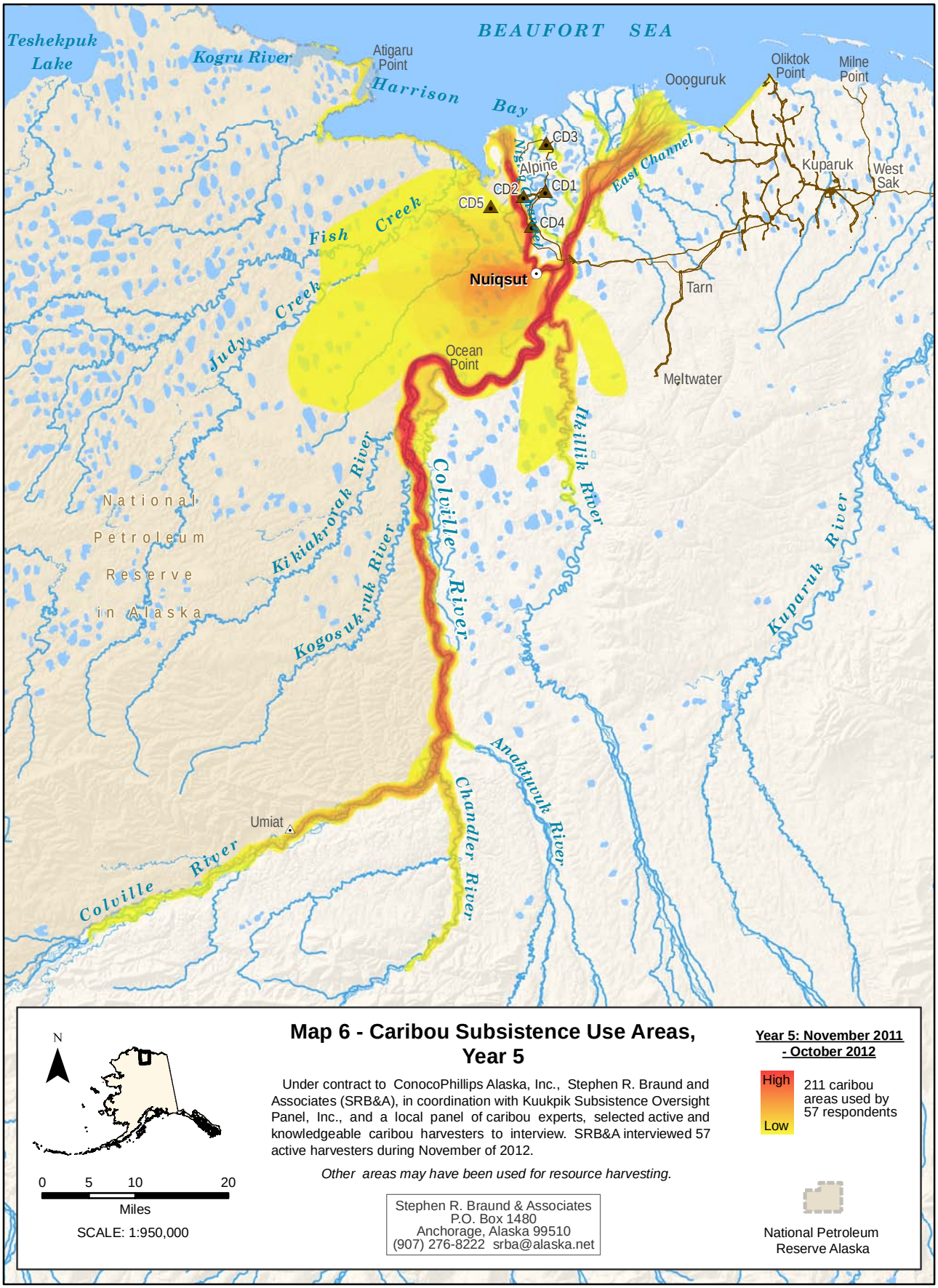
National Petroleum Reserve Alaska



Map 6 - Caribou Subsistence Use Areas, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

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Year 5: November 2011 - October 2012

High
Low

211 caribou areas used by 57 respondents

National Petroleum Reserve Alaska

Presentation of Interview Results

This report summarizes the results of the active harvester interviews using the verbatim (as close as possible by typing their responses during interviews) responses of study participants. The report presents the data as the observations of active harvester respondents. While researchers attempted to obtain the most detailed descriptions of residents' observations, they did not try to verify the factual basis of their reports.

RESULTS

Caribou Use Areas and Harvest Sites

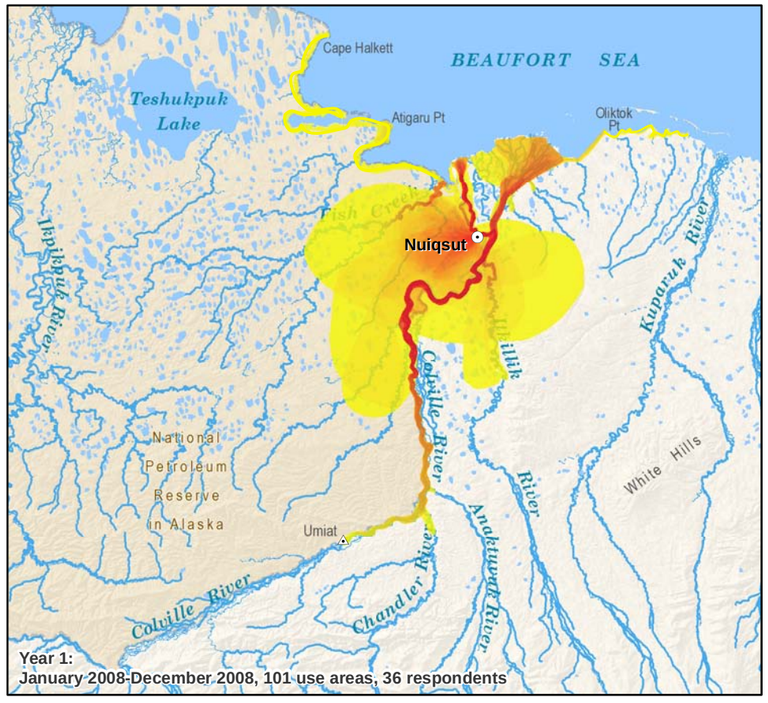
Nuiqsut respondents reported 211 caribou use areas for the Year 5 study period. In addition to providing the location of their Year 5 caribou use areas, respondents identified the location of their harvest sites within each use area. The locations and characteristics of Year 5 caribou use areas and harvest sites are described below.

Location of Caribou Use Areas and Harvest Sites

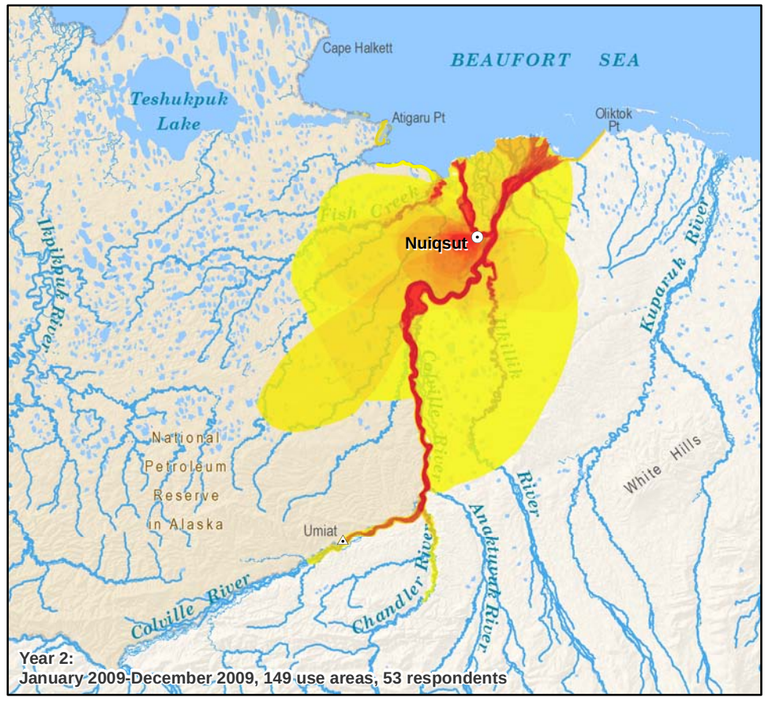
Nuiqsut Year 5 caribou use areas, as reported by 57 Nuiqsut respondents, are depicted on Map 6. Year 1 through Year 5 caribou use areas are depicted side by side on Map 7. As shown on Map 6, caribou harvester respondents reported traveling along local rivers, in the ocean along the coast of the Beaufort Sea, and overland both west and east of the community, in search of caribou during the Year 5 time period (November 2011 through October 2012). Residents' riverine travel extended along the Nigliq Channel and beyond Umiat along the Colville River, and along the Itkillik and Chandler rivers. Hunters also traveled along the coast east of the community to Oliktok Point and west of the community to just past Atigaru Point. Overland travel extended west to Judy and Fish creeks and approximately 10 miles southeast from the community. The highest numbers of overlapping caribou use areas in Year 5 occur along Nigliq Channel, parts of the East Channel of the Colville River, upriver along the Colville River to its confluence with the Anaktuvuk River, and along the lower portion of the Itkillik River. A moderate number of overlapping use areas also occurs overland in an area west of the community toward Fish Creek and Ocean Point.

Compared to previous study years, Year 5 use areas do not extend as far overland either to the south, east, or west of the community, and Years 2, 3 and 4 show a higher degree of overlaps upriver towards the Chandler River and at the mouth of the Nigliq River. The extent of riverine travel was relatively similar during all study years, although in Year 5 use areas extended beyond Umiat at a greater distance than in previous years. In contrast to previous years, active harvesters during Year 5 interviews reported a smaller use area to the east of the community. Year 5 also shows fewer overlaps in the lower half of the East Channel, and the lowest number of overlaps along Fish Creek compared to previous years. During a draft review meeting with the Nuiqsut Caribou Panel in February 2014, panel members discussed the decreasing use of Fish Creek in recent years. One panel member attributed the change to an increase in industrial activity near Fish Creek, stating, "There is so much activity in that area – there were no caribou the whole summer. The caribou that are there are not accessible, because they have moved away from the river" (SRB&A Nuiqsut Caribou Panel Meeting February 2014).

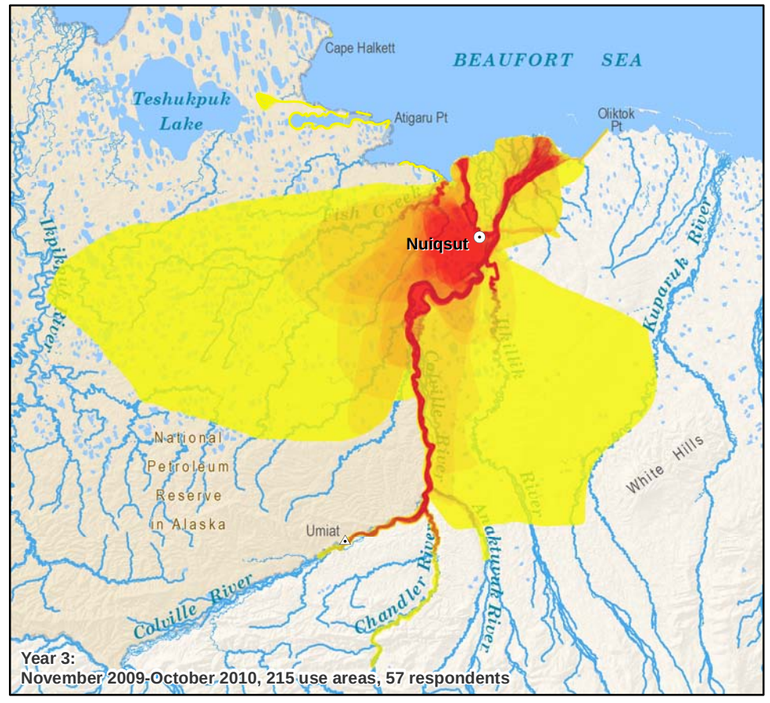
A variety of factors can affect the distance traveled each year to hunt caribou; these include water levels, snow conditions, and caribou distribution. For example, residents frequently note that their travel along the Anaktuvuk and Chandler rivers depends on yearly or seasonal changes in water levels. Residents may also use "shortcuts" near Ocean Point and along the Nigliq Channel during some years if the water is high enough. Residents indicated that winter travel also depends heavily on the availability of caribou; hunters generally will not travel farther than necessary in winter to harvest caribou, so if a herd is close to town, the winter use area for the community may appear smaller. In addition, while some residents have noted that



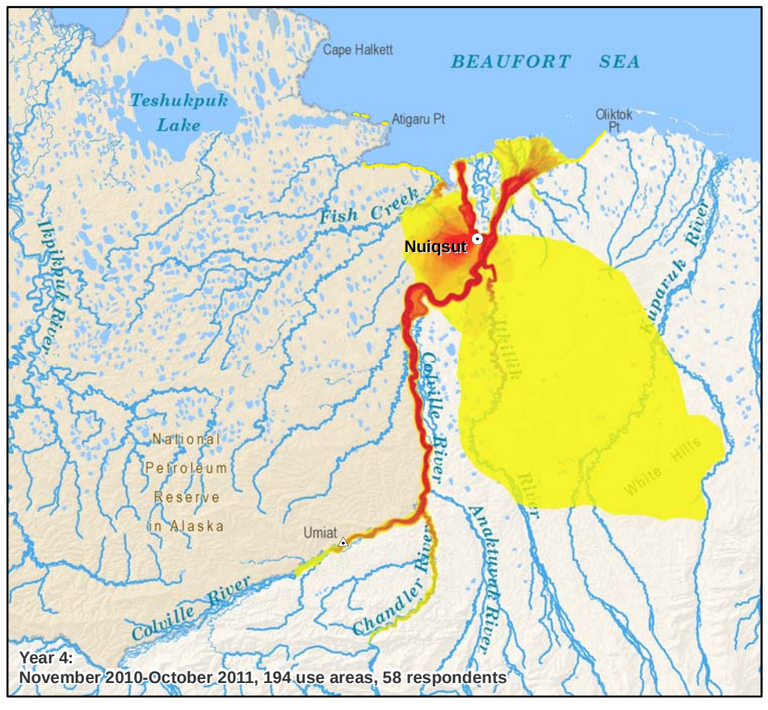
Year 1:
January 2008-December 2008, 101 use areas, 36 respondents



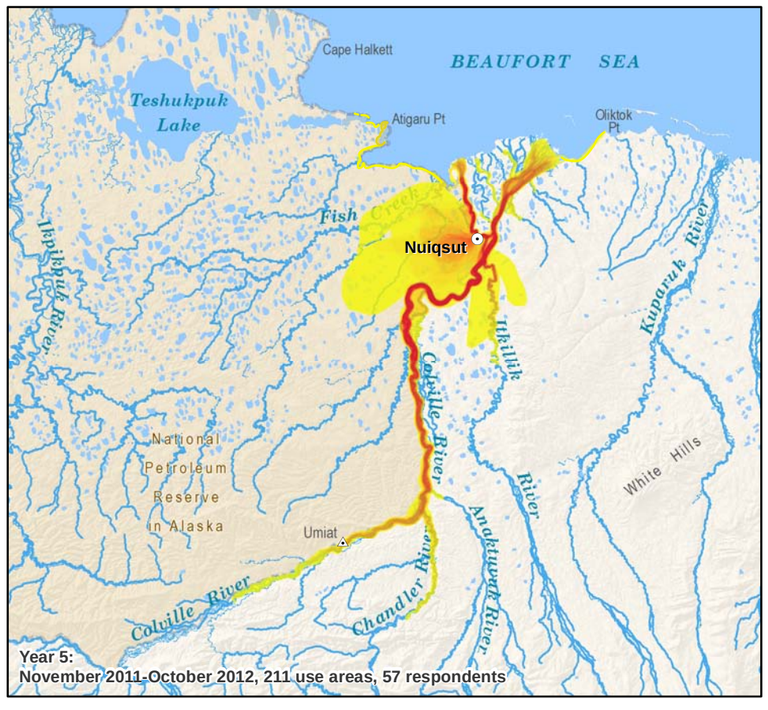
Year 2:
January 2009-December 2009, 149 use areas, 53 respondents



Year 3:
November 2009-October 2010, 215 use areas, 57 respondents



Year 4:
November 2010-October 2011, 194 use areas, 58 respondents



Year 5:
November 2011-October 2012, 211 use areas, 57 respondents

Map 7
Caribou Subsistence Use Areas: Years 1-5 Individually

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November of 2012.

Other areas may have been used for resource harvesting.

LEGEND

Overlapping Polygons

High

Low

National Petroleum Reserve Alaska

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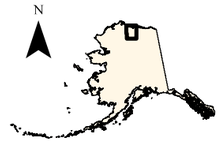
0 10 20 40
Miles

SCALE: 1:1,890,000



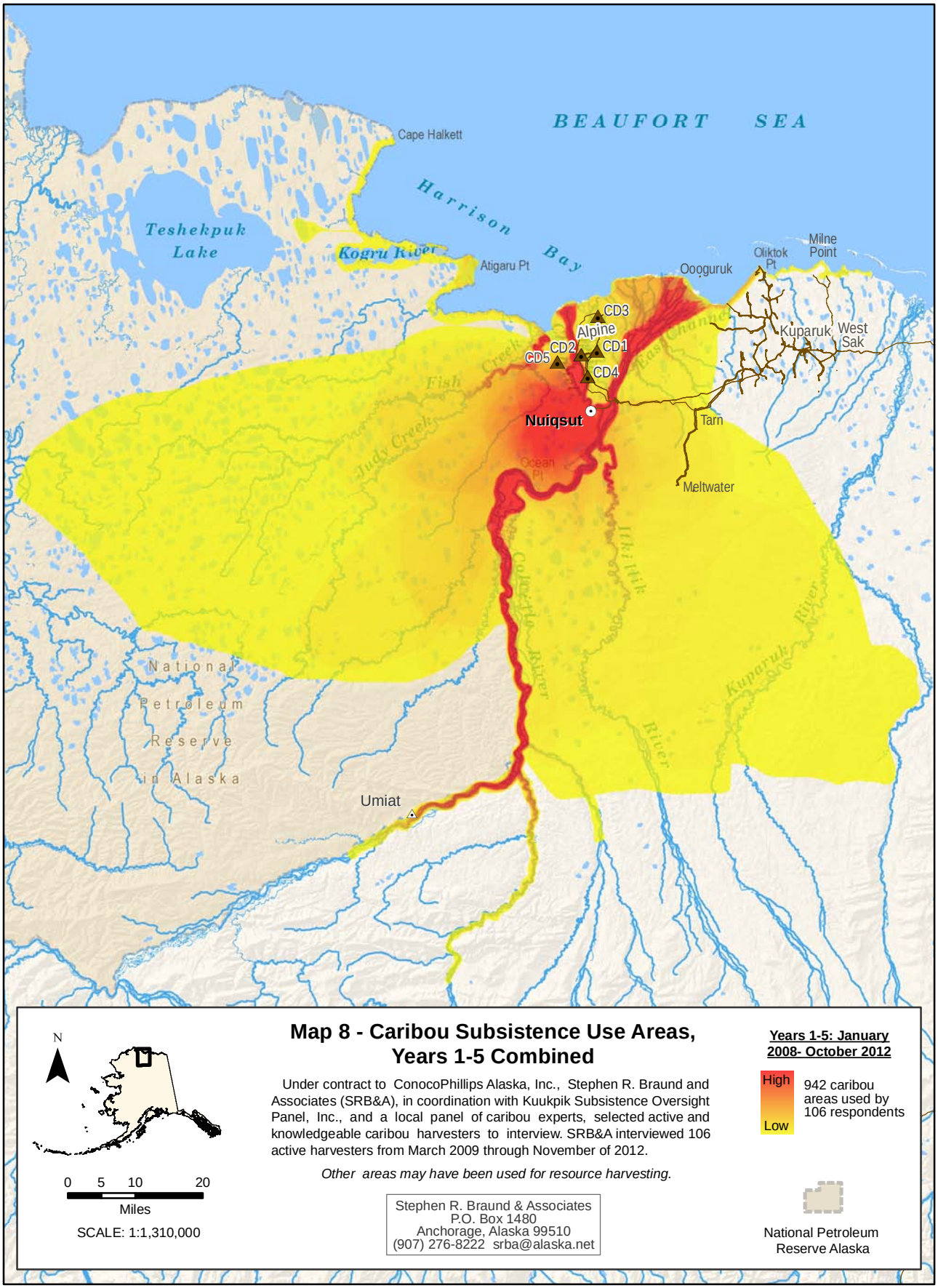
they will not hunt by snowmachine if there are no reports of a herd in the area, others will travel farther by snowmachine in search of a herd, especially if they are in need of meat.

Maps 8 and 9 depict caribou use areas for all five study years (1, 2, 3, 4 and 5), using two different methods. Map 8 shows overlapping use areas for all 942 polygons provided over the five study years, combined. The highest numbers of overlapping use areas during all study years occur along the Colville River, including the Nigliq Channel and East Channel and as far upriver as Umiat; along the lower portion of the Itkillik River; along Fish Creek to where it meets Judy Creek; and in an overland area between the community, Fish Creek, and Ocean Point. Over the five study years, use areas have extended as far as Ikpikpuk River in the west and beyond Kuparuk River in the east to Toolik River. Riverine use areas have extended along the Colville, Itkillik, Chandler, and Anaktuvuk rivers as well as along Fish Creek. Coastal hunting has occurred from Cape Halkett to beyond Oliktok Point (Map 8 and Map 9). Year 5 (Map 7) differs from the cumulative Year 1 through 5 use areas (Map 8) in that in Year 5 there were fewer overlapping areas (or less "red") directly to the west of the community; in the lower portion of the East and Nigliq channels of the Colville River; and along Fish Creek.

Map 9 also depicts overlapping use areas for all five years, but instead of portraying all 942 polygons, this map includes only one polygon per study year. Areas that were reported by at least one harvester during all five study years are portrayed by the darkest red, while areas that were reported by harvesters during only one study year are shown in yellow. Areas used during two, three, or four study years are shown in varying shades of orange. Areas used during a majority (four or five) of the study years include the Colville River (including the Nigliq Channel, East Channel, and portions of the middle Colville River delta) to Umiat; the Chandler and Itkillik Rivers; Fish Creek; coastal areas to Oliktok Point and Atigaru Point; an overland area west of the community between Nuiqsut, Ocean Point, and Fish Creek; and an overland area to the southeast of the community near the Itkillik River.

Map 10 shows the geographic locations of Nuiqsut caribou harvest sites, as noted by respondents during interviews using a 1:250,000 scale USGS map. Year 5 harvest locations are shown in red, with previous study year harvest locations shown in grey. In order to maintain a degree of confidentiality and also to account for the fact that respondents are often unable to pinpoint the exact location of a harvest due to the scale and accuracy of the USGS map, SRB&A shows all harvest locations as points buffered at a one-mile radius (or two mile diameter). Fifty-three respondents reported harvesting caribou at 195 harvest locations in Year 5. Respondents reported successful harvests throughout the Colville River Delta and upriver to a point just beyond Umiat. A high concentration of caribou harvests took place west of the community out to Fish Creek, with fewer harvests occurring east of Nuiqsut. Harvests were also reported in the Itkillik River as well as along the coast towards Oliktok Point to the east, and Atigaru Point to the west. A majority of harvest locations were reported north of Sentinel Hill on the Colville River. Map 11 shows harvest density for all study years combined, with areas of higher concentrations of harvests shown in red. Harvest density was determined through the use of the "Point Density Tool" located in the "Spatial Analyst" toolbox in ArcGIS 10.2.1. The "Point Density Tool" creates an analysis grid, in this case using 100x100 meter cells, to calculate the magnitude per unit area (in this case the number of caribou harvested) from a point feature (harvest locations shown on Map 10) that fall within a one mile radius of each cell. The one mile radius was chosen to account for variation in accuracy due to recording harvest locations on a 1:250,000 USGS map (see discussion above). The map accounts for all reported caribou harvests from all five study years, and the darkest red areas are the areas in which the most caribou were harvested over the course of the five study years.

High densities of harvest locations occur north of the community along the Nigliq Channel, west of the community to the Ublutuoch River, along the East Channel of the Colville River near Pisiktaġviq, near the mouth of and lower portion of the Itkillik River, and upriver from the community near Ocean Point and Kitik. Map 12 shows the same data for individual study years, using the same method described above. While the concentration of harvests is somewhat similar from year to year, there are some differences. Year 5 shows a greater concentration of harvests along the East Channel compared to previous years. In addition,



N

0 5 10 20

Miles

SCALE: 1:1,310,000

Map 8 - Caribou Subsistence Use Areas, Years 1-5 Combined

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November of 2012.

Other areas may have been used for resource harvesting.

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

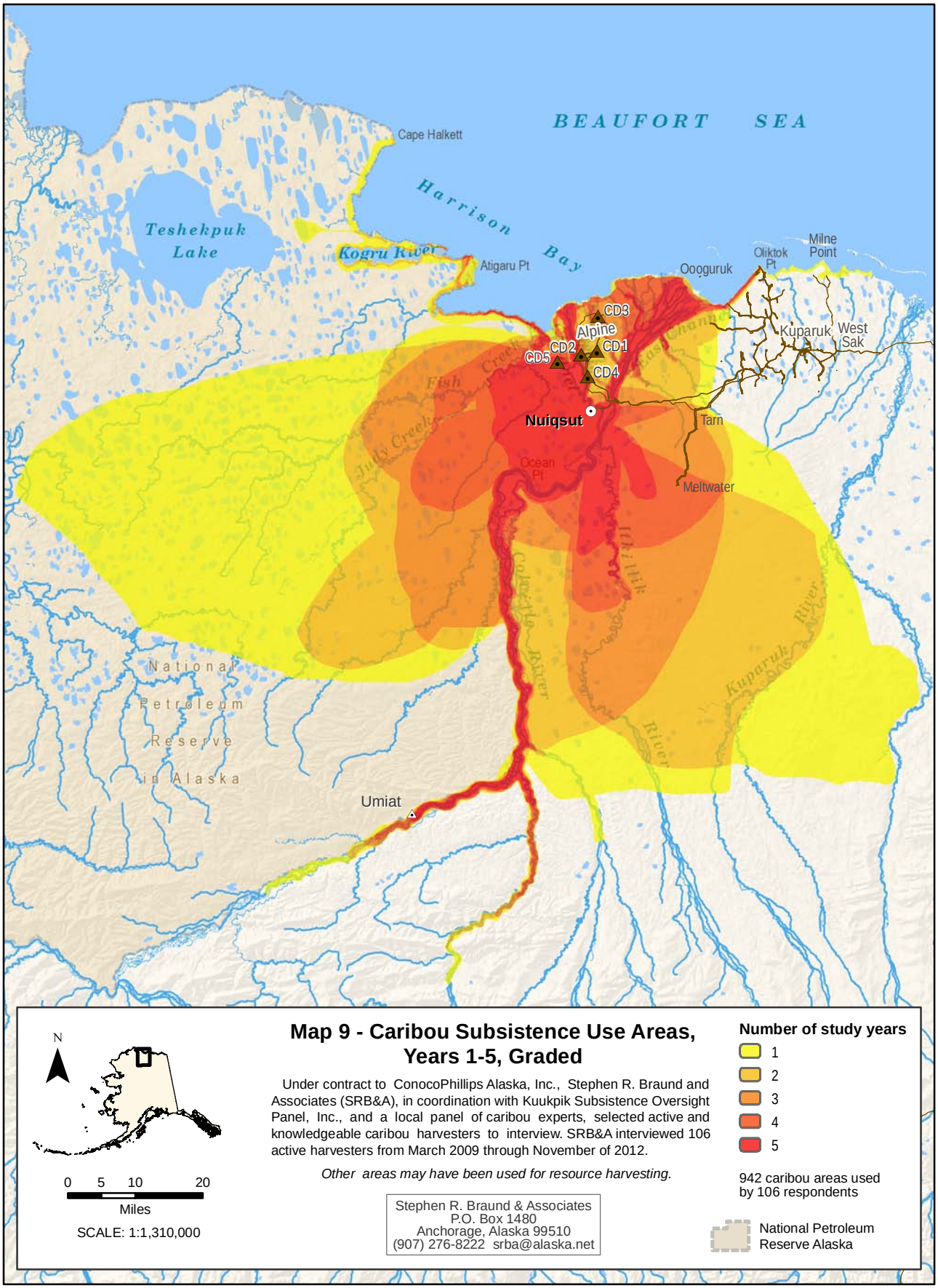
Years 1-5: January 2008- October 2012

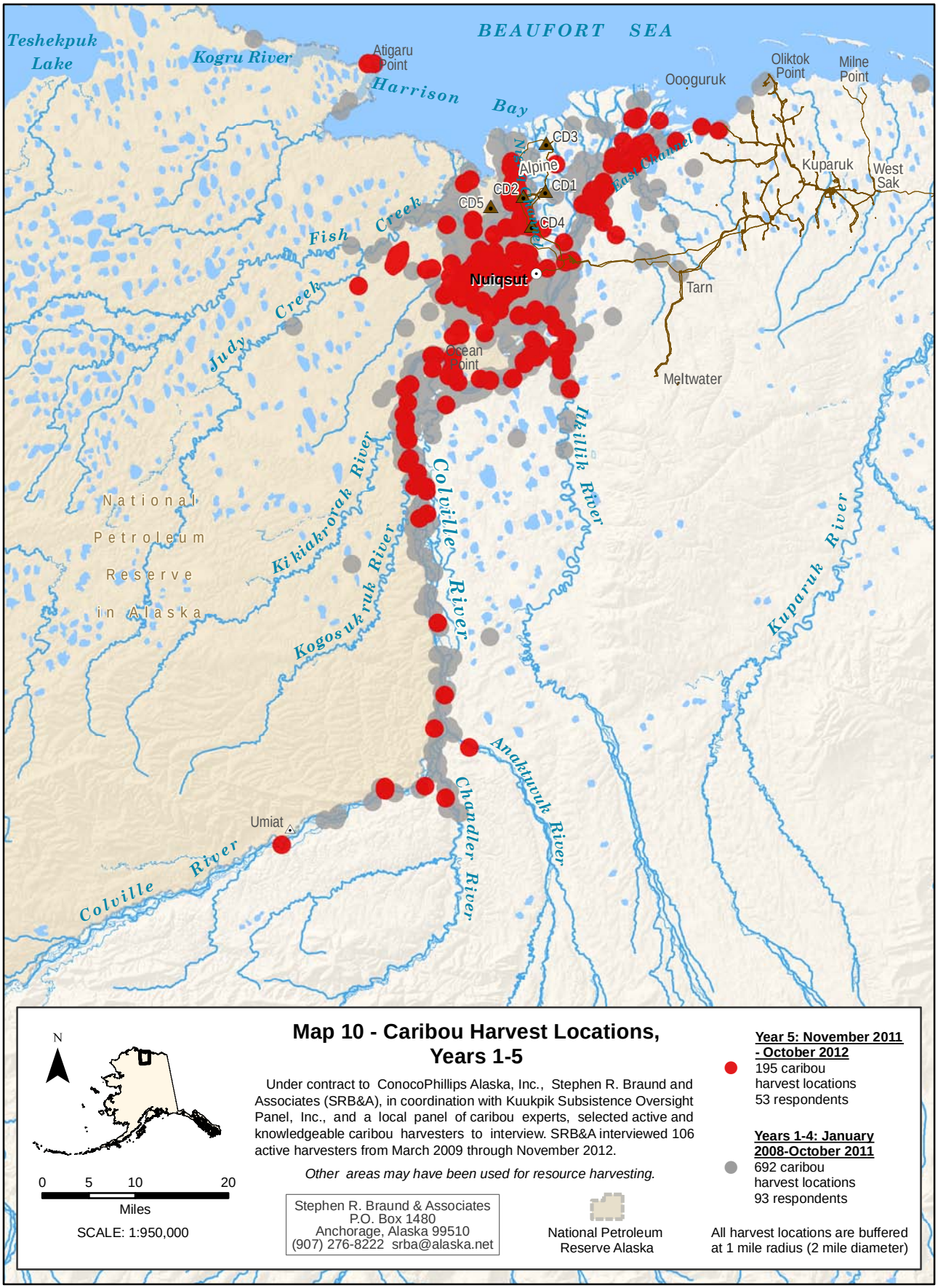
High

Low

942 caribou areas used by 106 respondents

National Petroleum Reserve Alaska


BEAUFORT SEA
Cape Halkett
Harrison Bay
Teshekpuk Lake
Kogru River
Atigaru Pt
Oliktok Pt
Milne Point
Oooguruk
CD3
Alpine
CD2
CD1
CD5
CD4
Kuparuk
West Sak
Fish Creek
Judy Creek
Nuiqsut
Tarn
Ocean Pt
Meltwater
Itkillik River
Colville River
Kuparuk River
National Petroleum Reserve in Alaska
Umiat
N
0 5 10 20
Miles
SCALE: 1:1,310,000
Map 9 - Caribou Subsistence Use Areas, Years 1-5, Graded
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November of 2012.
Other areas may have been used for resource harvesting.
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
Number of study years
1
2
3
4
5
942 caribou areas used by 106 respondents
National Petroleum Reserve Alaska



Map 10 - Caribou Harvest Locations, Years 1-5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November 2012.

Other areas may have been used for resource harvesting.

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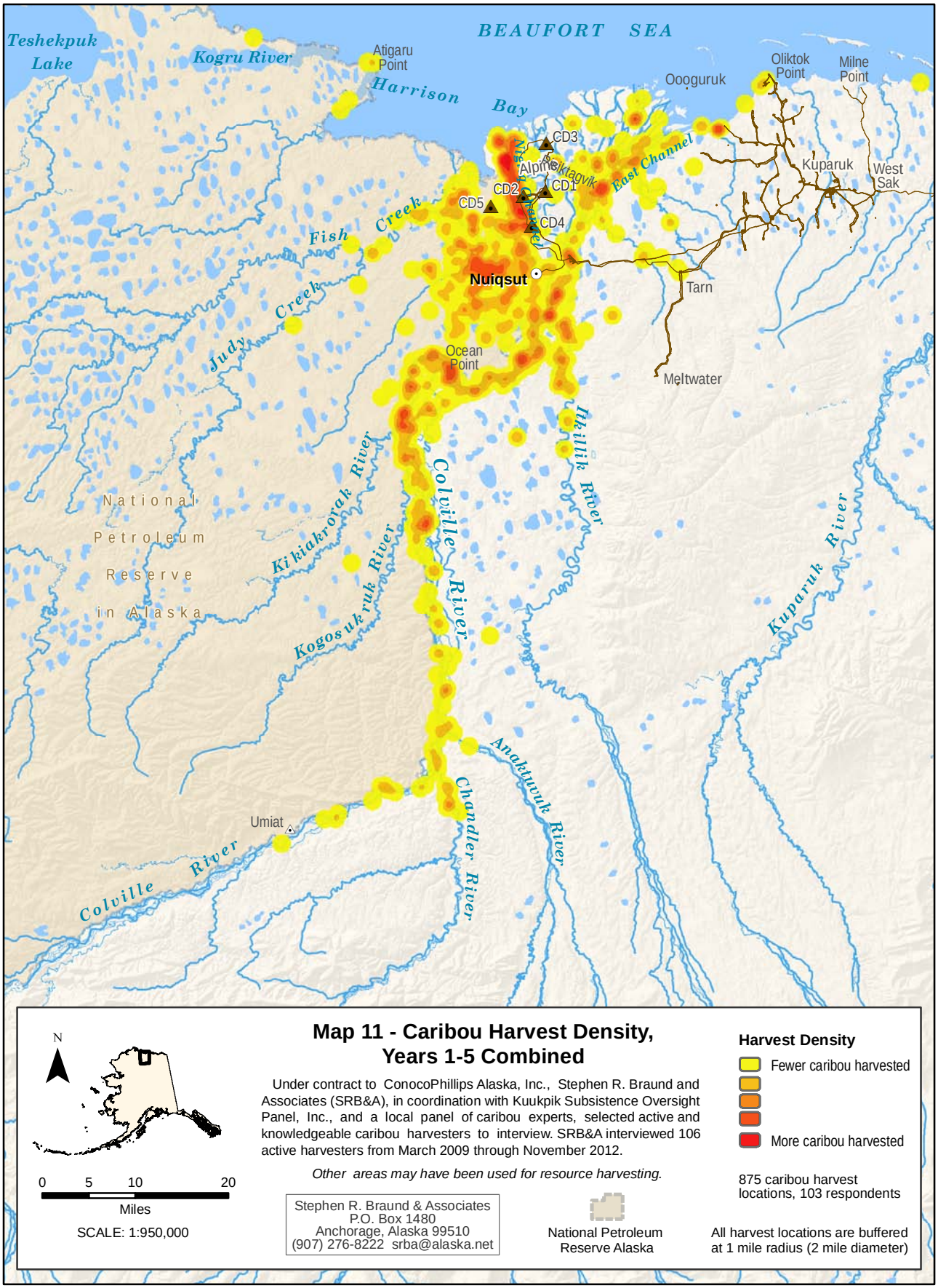
National Petroleum Reserve Alaska

Year 5: November 2011 - October 2012
195 caribou harvest locations
53 respondents

Years 1-4: January 2008-October 2011
692 caribou harvest locations
93 respondents

All harvest locations are buffered at 1 mile radius (2 mile diameter)



Map 11 - Caribou Harvest Density, Years 1-5 Combined

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November 2012.

Other areas may have been used for resource harvesting.

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National Petroleum Reserve Alaska

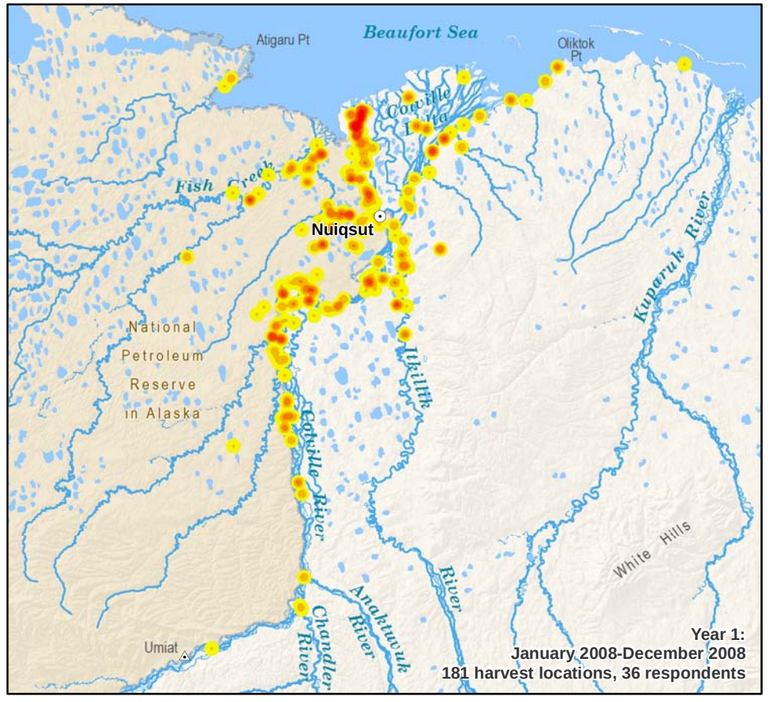
Harvest Density

Fewer caribou harvested

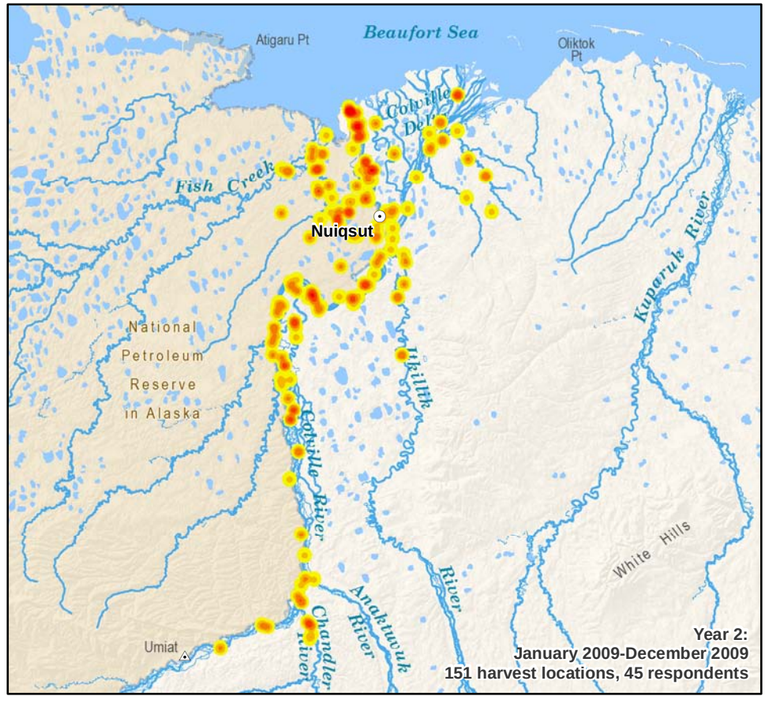
More caribou harvested

875 caribou harvest locations, 103 respondents

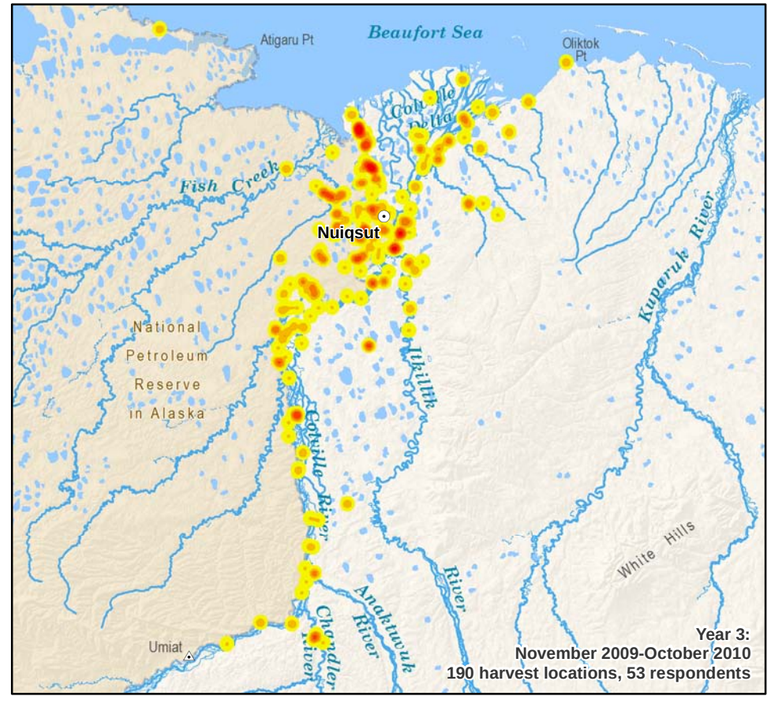
All harvest locations are buffered at 1 mile radius (2 mile diameter)



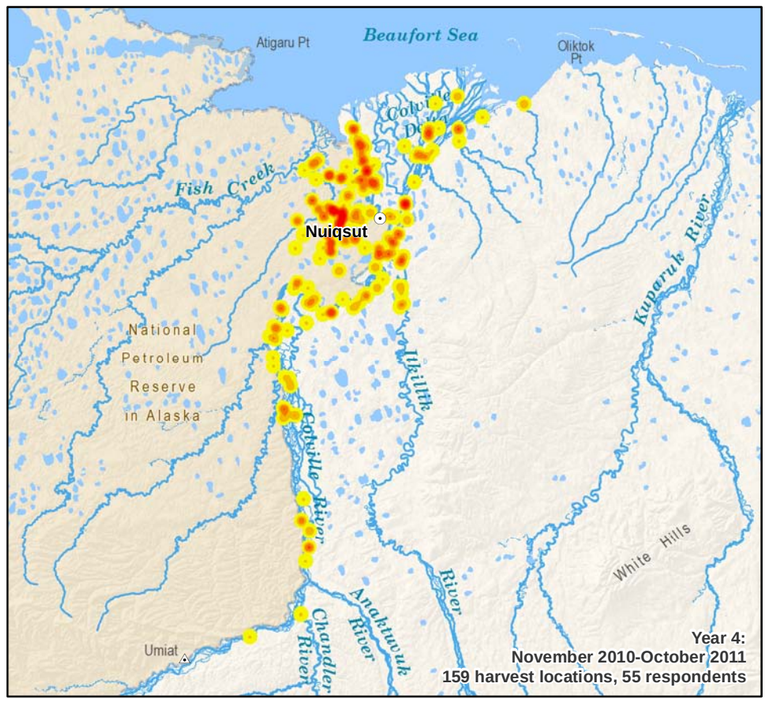
Year 1:
January 2008-December 2008
181 harvest locations, 36 respondents



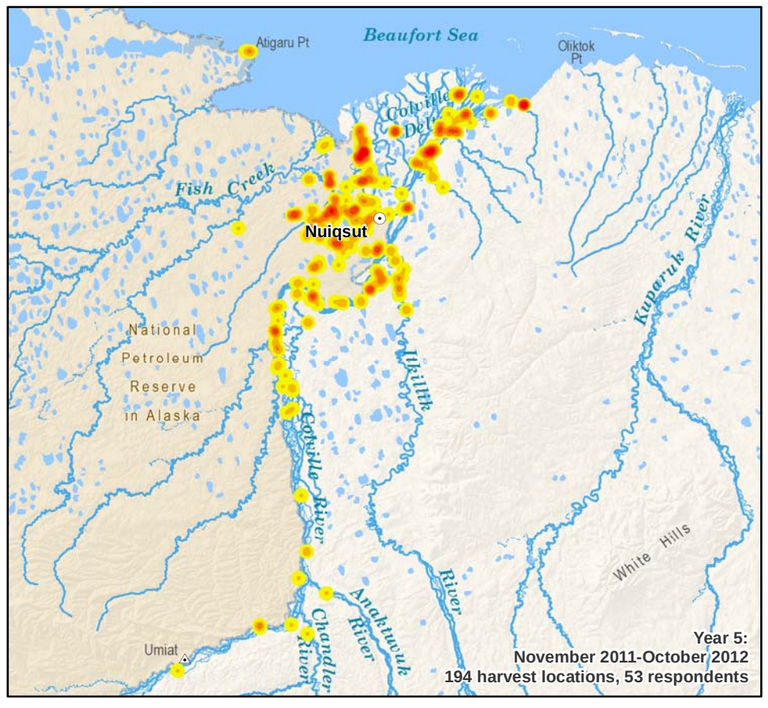
Year 2:
January 2009-December 2009
151 harvest locations, 45 respondents



Year 3:
November 2009-October 2010
190 harvest locations, 53 respondents



Year 4:
November 2010-October 2011
159 harvest locations, 55 respondents



Year 5:
November 2011-October 2012
194 harvest locations, 53 respondents

Map 12
Caribou Harvest Density, Years 1-5 Individually

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November of 2012.

Other areas may have been used for resource harvesting.

LEGEND

Harvest Density

Fewer caribou harvested

More caribou harvested

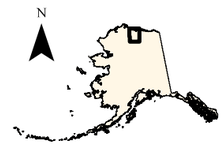
National Petroleum Reserve Alaska

All harvest locations are buffered at 1 mile radius (2 mile diameter)

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

0 5 10 20
Miles

SCALE: 1:1,300,000



Years 1-3 show a greater concentration of harvests near the mouth of the Nigliq Channel compared to more recent years. Harvests upriver show greater intensity during Years 2 and 3. Years 3 through 5 show a lower intensity of harvests along Fish Creek.

Nuiqsut caribou hunting activities occur primarily during the summer months by boat with residents traveling primarily along the Colville River (including Nigliq Channel and the "East" or Kupigruak Channel). The highest numbers of overlapping river use areas occur along the Nigliq Channel to the Nigliq camp area, and upriver to Sentinel Hill, with moderate overlaps as far as the mouth of the Chandler River and along the upper portion of the East Channel of the Colville River. Compared to previous study years, residents' river hunting activities did not extend as far along Fish Creek, Anaktuvuk River, or along the coast; however, residents traveled farther distances along the Colville River past Umiat.

The distances traveled along the Colville River each year generally depends on hunting success, water levels, available transportation, locations of camps or cabins and coinciding subsistence activities such as moose (which generally takes place farther upriver) and seal hunting (which occurs in the ocean). Nuiqsut residents frequently travel along the Nigliq Channel and in coastal areas during the summer months to hunt for caribou at the same time they travel to check fishing nets or camps, and on their way to and from the ocean where they hunt for seals, caribou and eiders:

> *We've been going to my* aapa*'s cabin on Nigliq. That was pretty much throughout the summer. We seen some but they were too far inland. About 15 to20 times throughout the summer days. Me and my brother and my cousin would take turns checking the net and we would look around; didn't see too much [caribou].* (SRB&A Nuiqsut Interview November 2012)

> *We went to Atigaru Point one time, we went around…. There were caribou around there, but it was so shallow we had to find a deep spot to go into. This side of Eskimo Islands, along the coast. For a little bit we went into the bay. There was nothing on the island; it is so shallow you have to go around them. We went in July when there was no ice around, so on the way back we went along the coast to check for seals.* (SRB&A Nuiqsut Interview November 2012)

> *We went to Fish Creek only one time, inside Fish Creek. Not too far in by [Resident's] cabin, close to that big lake. Fish Creek was one time, a day trip. When we went seal hunting, on the way back we decided to check around Fish Creek. We didn't see any caribou that time, but we were checking in there anyway.* (SRB&A Nuiqsut Interview November 2012)

Subsistence activities also frequently occurred on the East Channel of the Colville, with multiple respondents describing hunting activities within that area. Frequently mentioned locations within this area included Pisiktaġvik, Lonely Island and Helmericks (once the site of a commercial fishing operation). Harvesters described their use of the area as follows:

> *[We went up as far as] Helmericks. They [caribou] were coming from the east side and they crossed. We checked those little creeks [Miluveach and Kachemach rivers]; we didn't see nothing but brown bears and muskox. We kept going until we hit bottom, maybe a mile and a half or something [into the creek]. We looked to* Pisiktaġvik*, and we went to Lonely Island right by Helmericks but then we turned to* Napasulu*…that's where we saw those tuttus crossing, they were coming on the ocean side.* (SRB&A Nuiqsut Interview November 2012)

> *With a boat, I went over here [East Channel]. All the way out, before Oliktok, out here someplace. Along the…. Just down here. You had to walk out, in and get some place where it's steep, and scout out there for caribou. [We stayed on] Lonely Island [side]. I took* Napasulu*. That's the only way [to get to the main channel]. Because that other channel we usually use [*Putu*], it's shallow nowadays. Four times we went out [by boat]. At the same time [we are] looking for something, you know, even with the rescue boat, we had to do the same thing [looking for something]. The way we do it [is] if we get caribou [during a rescue mission], then we distribute it to the city, and the city [gives it to families].* (SRB&A Nuiqsut Interview November 2012)

This way [up the East Channel] I went a couple of times. I went up to my Grandparents cabin, too, at Helmericks. I also went up here when it was really hot; I went up this way [on the east side of the channel]. I went over here by the mountain [Kachemach Mound]. Almost to the ocean, I'd say around over here. I stayed on that side. We seen a lot [of caribou], but they were just too far, way inland. (SRB&A Nuiqsut Interview November 2012)

A number of harvesters noted that a herd was present near the East Channel of the Colville River, and while some were able to harvest caribou from this herd, others indicated that the herd stayed too far inland for hunters to access them. Several individuals described,

We went in the main channel; we tried to go how many times through this channel, but we couldn't go through it. We went, we went all the way to Helmericks, in that little channel right here. And then [went back] the same way. [We didn't get caribou] not at Helmrich's, we saw a lot [of caribou] but they were way inland. (SRB&A Nuiqsut Interview November 2012)

Over here [east channel] This way just somewhere around here on the Lonely Island side. Got to Helmericks, but not to the ocean. Went the long way. One time me and [Name] got like five or six tuttus in a couple days. I didn't catch them; [Name] did. Right there but on the other side [east side of the channel]. I think it was three that day. [Name] got them. Males. I helped cut and carry. And a couple days later we got two around in the same spot cause that's where they are usually we got ours right here when we went in. They were all males. I tried to shoot one but I missed. They were all in July. There was like, a couple thousand. They were both in a big [herd]; couple thousand, big herds – there was lots. Just [went] three times down the East Channel, all in July. They were all healthy, just one sick one all summer. (SRB&A Nuiqsut Interview November 2012)

Second one was somewhere up here, right past [Name's] camp. And that's where we got our second caribou on the Colville. Helmericks side, about three miles upriver from Helmericks cabin, and that third one was over here. I didn't have any access to try and harvest them because it was too shallow. There was no way to get to them. There was a group that was hanging around that area and on the island. They just stayed on the island and lay down, grazing around. They weren't moving around a lot. I usually, that's my original trail, going downriver, on the west side of Pisiktaġviq. *That's where those hundred caribous were at that one time when we took those kids out. That's the largest [herd] we saw is like a hundred.* (SRB&A Nuiqsut Interview November 2012)

In addition to hunting caribou in the Nigliq Channel and East Channel, respondents described going upriver along the Colville by boat looking for caribou during the summer months. Generally, harvesters travel to specific areas on the Colville (e.g. Ocean Point, Sentinel Hill) in an attempt to harvest caribou. Multiple residents described,

I went past Ocean Point this summer. I went close to Umiruq *[near Sentinell hill]. That's way below Anaktuvuk River, below that Sentinel Hill. It's closer on the north side of, uh, Sentinel Hill.* Umiruq *is like a big, like the shape of a big arc ship. It's like a big mound, but when you look at it it's like the shape of a big boat. That's why they call it* Umiruq. *I never get past Sentinel Hill. You look, but it doesn't seem like there's caribou on that side.* (SRB&A Nuiqsut Interview November 2012)

[I went hunting] up the river. Up here to Ocean Point and right around here is where I got that caribou. I went past that all the way to my dad's cabin. I seen a few more caribou but didn't get one. I stayed in main channel. (SRB&A Nuiqsut Interview November 2012)

Maybe twice [we went upriver]. We didn't go as far – we'd stop at Ocean Point, [have a] bonfire and play in the bluff looking for moose or caribou. We'd overnight right here at this little cape/creek right here, with the boys, across from Ocean Point. We didn't catch anything up there. The later part of August. (SRB&A Nuiqsut Interview November 2012)

A number of respondents traveled into Itkillik River during the summer to look for caribou. Respondents have often noted that Itkillik River is too shallow to allow for extensive access, depending on the type of boat used, but that caribou are frequently present in the area. Several active harvesters described,

I didn't find any caribou up Itkillik. We don't get pretty far, because it gets pretty shallow. Not to the landing strip. Maybe [we went] five bends, close by the old airport. (SRB&A Nuiqsut Interview November 2012)

And one [caribou] was on the side of Itkillik River. It was quite a ways in there. I went almost to that airport, it was really shallow. We started right here. It [the caribou] was separate [by itself]. I turned around cause it [Itkillik River] was too shallow. (SRB&A Nuiqsut Interview November 2012)

We went over to Itkillik. Not too sure how far we went. Past the landing strip. We went far past it, more like five or six turns in there. We shot at a caribou but the guy that was shooting was off sight so we didn't get it. We went a couple times. His mom was wanting some caribou. That was just day trips until no more sun. Which there is always sun, but she was hungry. It was at least a month before whaling. Because that was the time I was mainly going out, August and July. (SRB&A Nuiqsut Interview November 2012)

It had to be up here, past the airport. Like 30 miles past the airport. It kind of gets bigger and wider and deeper as you go. It starts out shallow and then just gets deeper. I was surprised. I think we got one [a caribou] around here, on the long stretch. (SRB&A Nuiqsut Interview November 2012)

Nuiqsut caribou hunters also travel substantial distances upriver during the summer and fall months in search of caribou and, starting in August and September, moose. When water levels allow for access, the Chandler River is a common hunting location. Respondents described hunting activities taking place within the Chandler River during Year 5, with several individuals traveling even farther upriver to Umiat. Respondents often paired their upriver caribou hunting with moose hunting when traveling to these areas area. Several respondents described,

I'm trying to think if it was at Umiat or Chandler, maybe four bends up Chandler, by the first line of trees? We went um, to where it just turns to valleys – maybe 35 to 40 miles up in Chandler. That's exactly where we were! I remember that big valley right there! That was pretty much my first time going up that far. I couldn't believe how many empty barrels I saw! That was in August…. Like I said I scoped [the caribou] out, but they were always a couple miles inland. (SRB&A Nuiqsut Interview November 2012)

[We went hunting] upriver. I would say pretty close to Chandler. We were camping somewhere around there, in the main channel. Next, we went up to Chandler to try and look for some moose or caribou. Yeah, we went into Chandler. I don't know [how far in we went] not pretty far from Chandler. Not to the bluffs. (SRB&A Nuiqsut Interview November 2012)

We went up to Umiat for moose. We were looking for caribou at the same time. I just went past a bend. Yeah, we also went inside Chandler a few times. Twice [we went] all the way to Umiat. We camped out five days. Both five day trips. And we went to the mouth of Chandler and we camped there. That was the second time I went of the two times I went this far. It wasn't just right here for five days, it was along this [whole] channel [of the river]. (SRB&A Nuiqsut Interview November 2012)

I went all the way upriver towards Umiat. Past Umiat. We were trying to get gas from them but they wouldn't sell us any. We caught one [caribou] a couple miles from Umiat. We went around the bend. I went twice. Two days we were camping out. We camped a little after we left Umiat, by Chandler, where we caught that moose. We were looking for anything, really. We were tired of staying out there. After we got the moose we cooked it right away. Right before the ending of moose season, August 20-something, I'd say August 26th we got it [the moose], and that's when we caught the caribou with the wire around it. I can't say exactly how far it was – four or five miles past Umiat, maybe. (SRB&A Nuiqsut Interview November 2012)

In addition to traveling and hunting along rivers by boat, residents also traveled overland by four-wheeler looking for caribou, often using a four-wheeler trail that extends west of the community. The majority of four-wheeler travel occurred west of the Colville River and Nigliq Channel toward Fish Creek and Ocean Point.

I did [use a four wheeler to hunt caribou]; the caribou I caught was a sick one. It was the second sick one of the summer, let's say about seven miles. About to here… around these lakes. I came straight out [west of Nuiqsut]. I came home empty handed, because of that caribou being sick. You can never tell until you see it. Was a few hour route, just like that. (SRB&A Nuiqsut Interview November 2012)

I did once, just by these lakes maybe four to five miles out. This fall, [I went] one time. I seen more around, more by this lake when I stand on my four-wheeler, but one was good enough for me at that time, I was tired. I think it was the end of…like the second week of September because it was not too far after the ground started to get kind of frosty. That was the only time I went out with the four-wheeler. (SRB&A Nuiqsut Interview November 2012)

Once snow conditions are adequate, some residents hunt caribou by snowmachine. Residents generally travel farther by snowmachine than they do by four-wheeler, and in Year 5 their winter hunting activities extended south to Ocean Point, west towards Fish Creek and Judy Creek and around Itkillik River and beyond. Two individuals described their winter hunting areas as follows:

Mostly on the west side, west of Judy Creek, [with] snowmachine. From Nuiqsut we travel all the way to Judy Creek. Cut through the river and [to to] Fish Creek and Judy Creek. Traveling most of time to look for caribou right now, because right now the migration of the caribou are further out. That was what we used to do when we go caribou hunting because he is picking me up and he don't like to go out alone. Just go around and go up to Fish Creek area, maybe up a little, and cut back and go by the cabin by Fish Creek. The caribou seem further out this year. The caribou migration are kind of different this year compared to last year. Further away from the village. (SRB&A Nuiqsut Interview November 2012)

This was in springtime I went [by snowmachine]. Before break up, sometime in May or end of March. Sometime around end of April or May. I went upriver and, where is the camp [at Itkillik]? I went to the next point right here…. Just a place where we have our old landing strip when they first come, and that used to be secondary landing strip for airplanes. About right there. April or first part of May. I went out and borrowed my son's snowmachine. I just went to the point and there is a big hill. I went up on top and looked around and saw a whole bunch of caribou and they were too far out and I only had five gallons of gas, I couldn't reach them at that time. I saw maybe 30 caribou all in one spot. (SRB&A Nuiqsut Interview November 2012)

I just went towards Fish Creek, only looking [for caribou] if they were around. I saw some but they were across the river. Only during fall time I went caribou hunting, before the river froze. I go around these lakes up there, same way. Maybe it was the third week in October. I set my net over there; I just went over there maybe four or five times [to check it]. (SRB&A Nuiqsut Interview November 2012)

Characteristics of Caribou Use Areas and Harvest Sites

Study participants characterized their Year 5 caribou use areas for the following variables: success (measured as whether the respondent successfully harvested caribou in the use area or not), number of trips, duration of trips, travel method, and timing of hunting activities. Caribou harvest locations were characterized by month, number of harvested caribou, and sex of harvested caribou. The following sections describe the above characteristics as they pertain to caribou use areas and harvest sites.

Timing

As shown in Figure 1, caribou hunting activities over the five study years occurred in every month with a peak number of use areas reported in July or August. The highest percentage of Year 5 caribou use areas were reported for the month of August, similar to the previous study year (Year 4). In Years 1 through 3, the percentage of use areas peaked in July, rather than in August. Figure 2 depicts the percentages of reported caribou harvests by month. Similar to the number of reported areas, the number of reported caribou harvests also peak in July and August for all study years. In Year 5 the peak in caribou harvests occurred during the month of August. Some harvesters cite preferences for caribou harvested at different times of year, with residents indicating that the caribou are fat during the late summer months. However, the timing

Figure 1: Nuiqsut Percentage of Caribou Use Areas by Month, Years 1-5

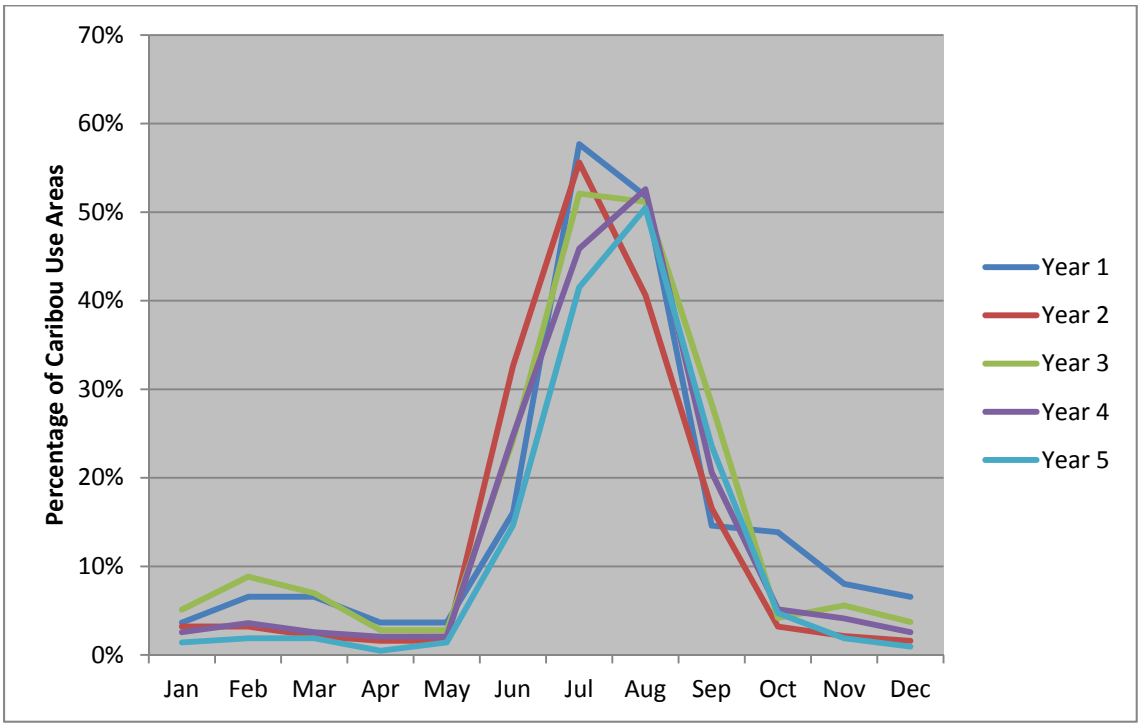
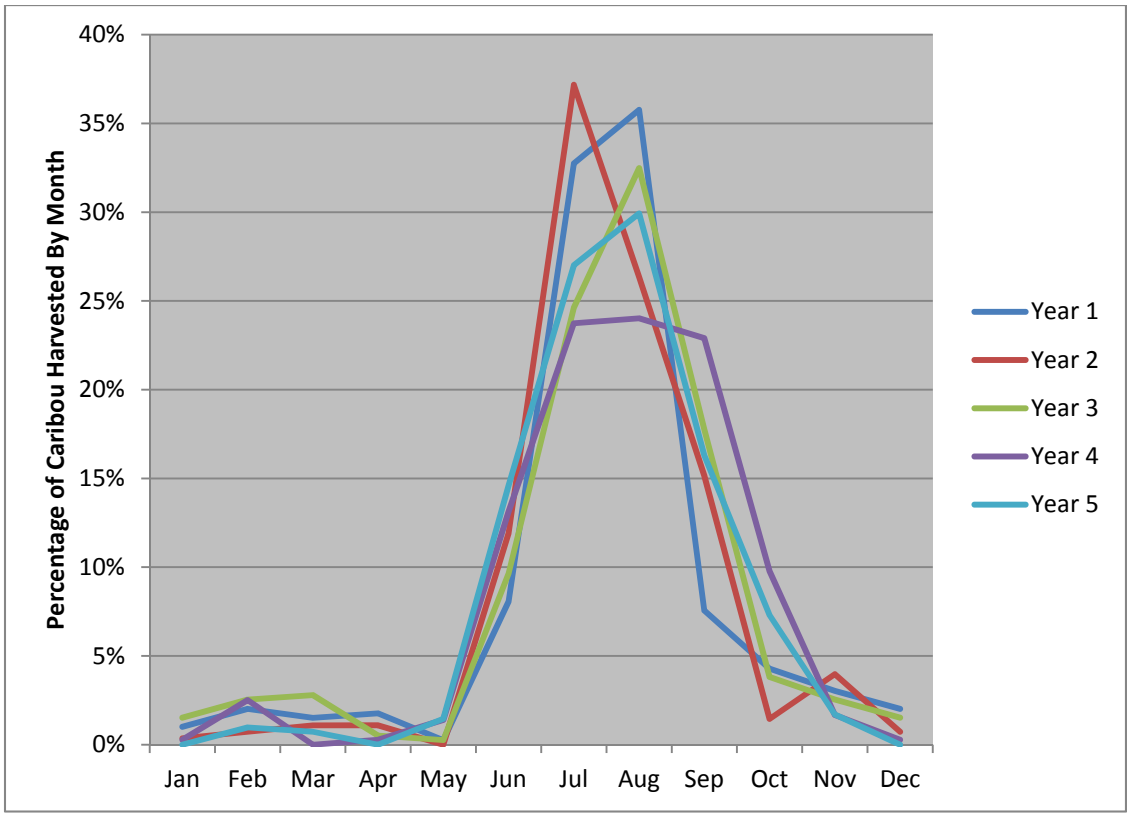


Figure 2: Nuiqsut Percentage of Caribou Harvested by Month, Years 1-5



of harvests and hunting activities also depend on resource availability (i.e., whether caribou are in the area where they are traditionally harvested) and environmental factors (i.e., ice and snow conditions).

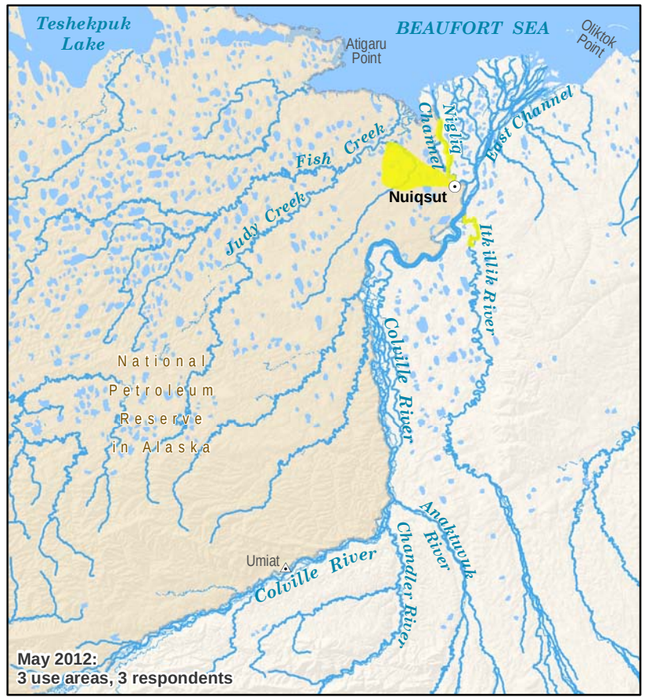
Maps 13 through 16 show Year 5 caribou subsistence use areas and harvest locations by month, and Maps 17 and 18 show the extent of previous study years (Year 1, Year 2, Year 3 and Year 4) as a single polygon, with harvest locations. According to Year 5 active harvester interviews, during the month of May harvesters reported only limited travel within Nigliq Channel and the Itkillik River, and limited travel to the west of the community (Map 13). During previous years respondents have reported overland snowmachine travel west of the community to Ikpikpuk River during the month of May as well farther upriver; travel in May is generally dependent on ice and snow conditions.

During the months of June through September, active harvesters reported a heightened level of activity along the waterways of the Colville (including Nigliq and East Channels), Itkillik, and Chandler rivers (Map 13). The activity that takes place during these four months extends from below Umiat in the south to the coast north of the community. The majority of this activity takes place along the Colville River near the community, both upriver past the Ocean Point area and downriver on both the East Channel and Nigliq Channel. Previous years have shown additional use areas into Anaktuvuk River during the summer, and more extended use areas into Itkillik River during the first few months of summer.

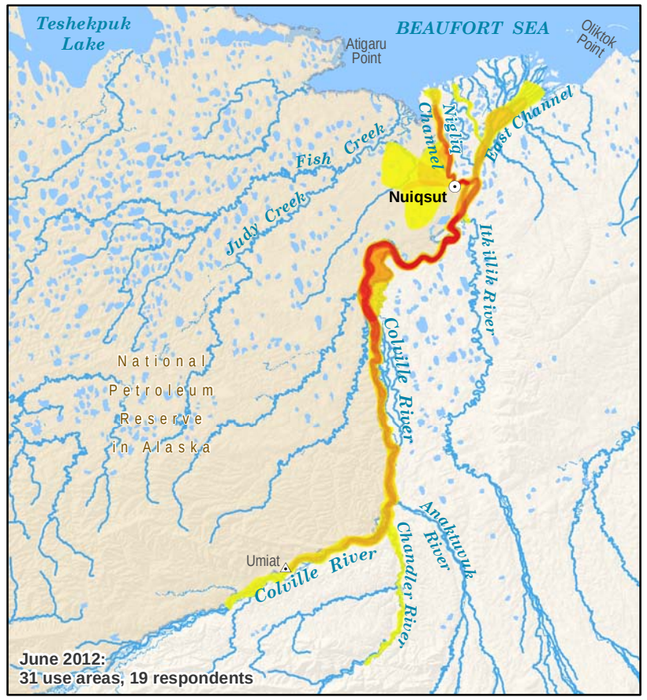
Respondents generally attribute their use of Itkillik and Anaktuvuk Rivers to accessibility based on water levels. In terms of riverine travel, the month of June shows an emphasis on the Nigliq Channel and upriver to the Sentinel Hill area; July shows an emphasis on those areas in addition to the East Channel and Itkillik River; and the months of August and September shift their emphasis upriver toward the Chandler River (Map 13). During the months of July and August, respondents also reported traveling by boat to coastal areas west of the community, with use areas extending up to Atigaru Point and Cape Halkett, similar to areas depicted in June, July and August of previous study years. These locations have generally been utilized by a small number of respondents, who reported more limited coastal caribou hunting in Year 4 and Year 5.

Overall, harvest locations during the summer months occurred in similar locations for all five years of the study, with the majority of harvests occurring close to the community and harvests occurring with less frequency with increased distance from the community (Map 13, Map 15). This trend may be due to the fact that a much higher number of trips are taken within a short distance of Nuiqsut compared to the number of long distance trips taken. Upriver trips are also often combined with moose hunting, and therefore caribou are not the only target species during these trips. During the summer months of Year 5, harvests took place at the greatest distance from the community during the month of August; this month included harvests as far south as Umiat and as far north as Atigaru Point. Certain areas saw concentrations of caribou harvests during certain months. The Nigliq Channel and the East Channel, for example, show increased concentrations of harvests during the month of July, and the area west of Nuiqsut saw increased concentrations during the months of August and September. In contrast, the area around Ocean Point saw somewhat equal concentrations of harvests throughout the months of June, July, and August. Caribou were harvested every month from May to October during the Year 5 study period (Map 15).

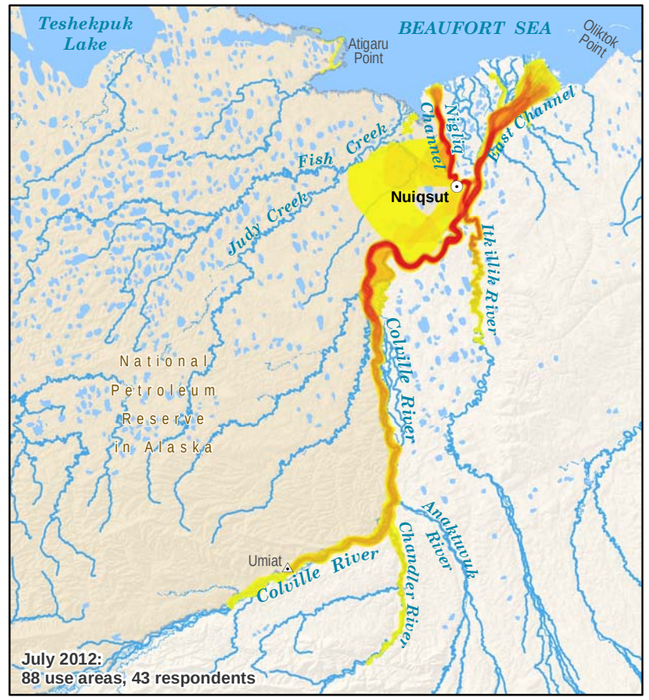
Starting in August and peaking in September and October, harvest activities increase in an overland area west of the community (Map 13 and Map 15). October hunting activities occur almost solely in overland areas, as do hunting activities for the remainder of the calendar year (Map 14). Year 5 hunting activities during the months of October, November and December (Maps 13 and 14) generally consisted of shorter travel distances around the community. Respondents generally reported using areas to the west of the community, from Fish Creek toward Ocean Point. These locations are within the boundaries of all previous study year locations, although they do not reach the extent of all previous years use areas (Map 17).



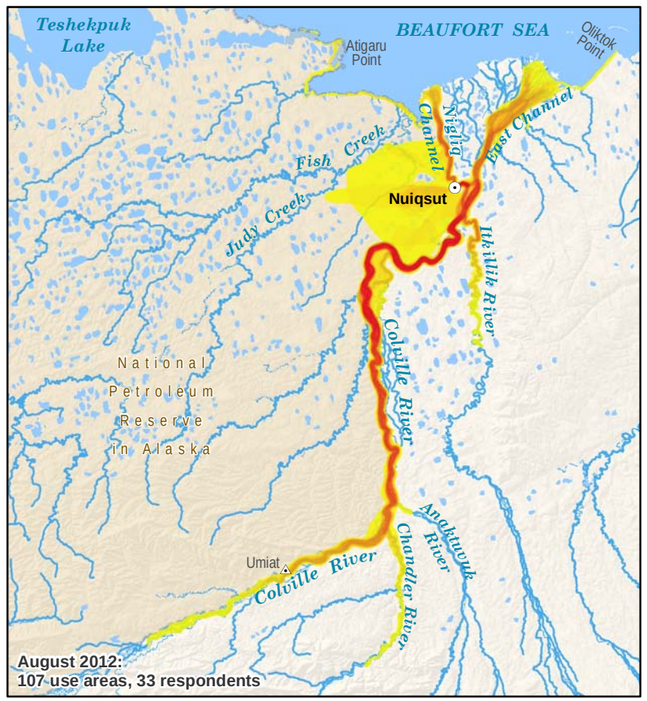
May 2012:
3 use areas, 3 respondents



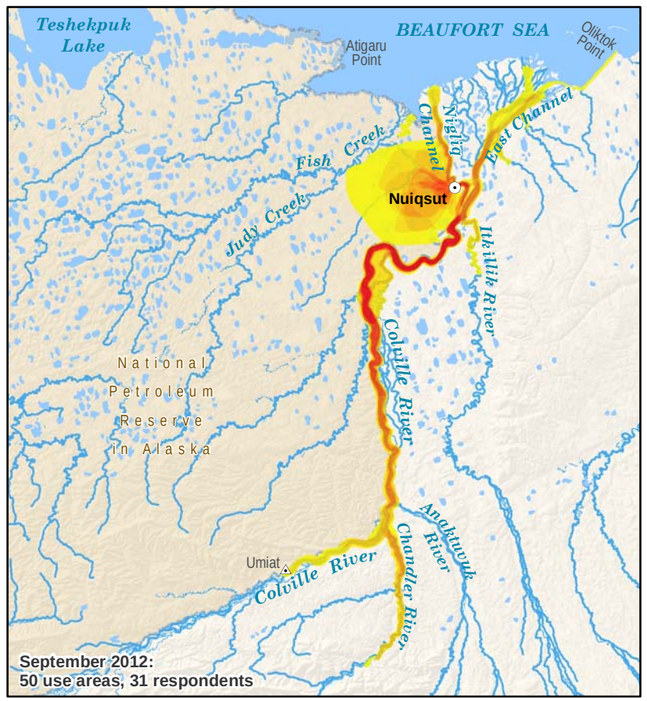
June 2012:
31 use areas, 19 respondents



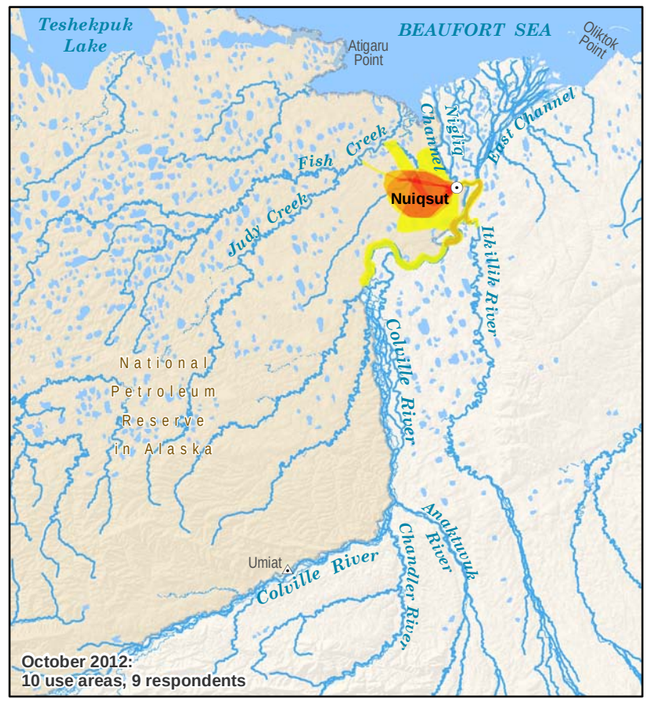
July 2012:
88 use areas, 43 respondents



August 2012:
107 use areas, 33 respondents



September 2012:
50 use areas, 31 respondents



October 2012:
10 use areas, 9 respondents

Map 13
Caribou Subsistence Use Areas, May - October, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

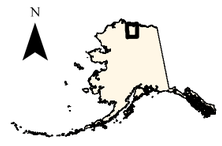
LEGEND

Overlapping Polygons

High

Low

National Petroleum Reserve Alaska



0 5 10 20
Miles

SCALE: 1:1,500,000

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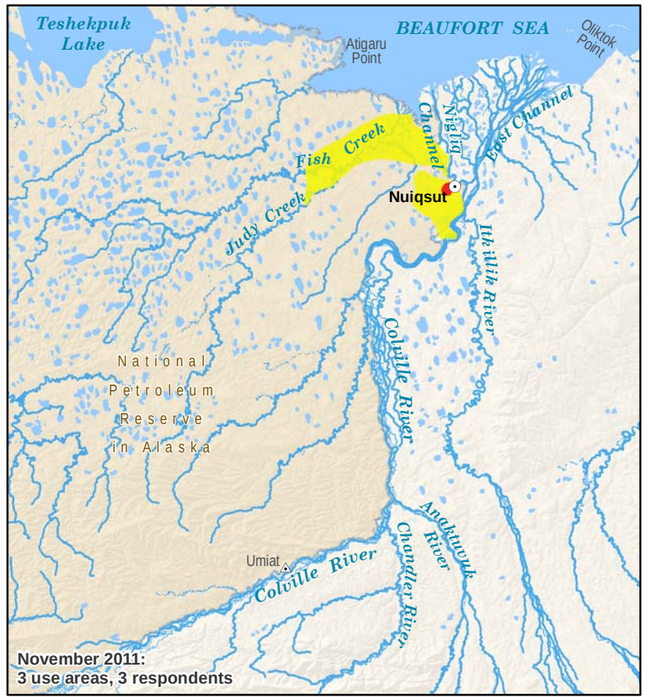
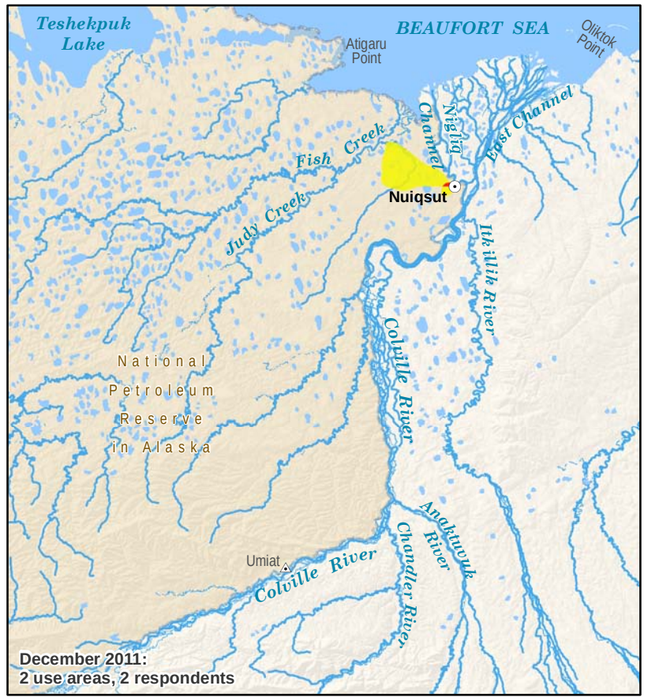
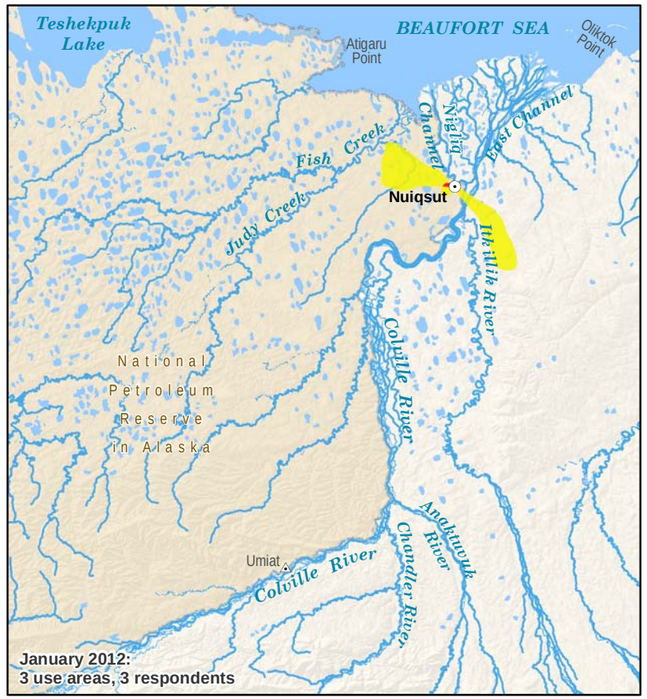


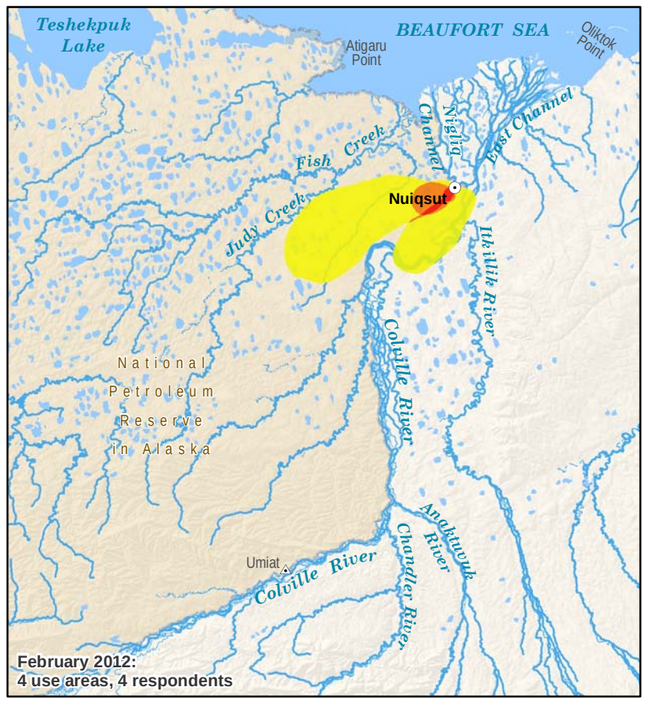
November 2011:
3 use areas, 3 respondents



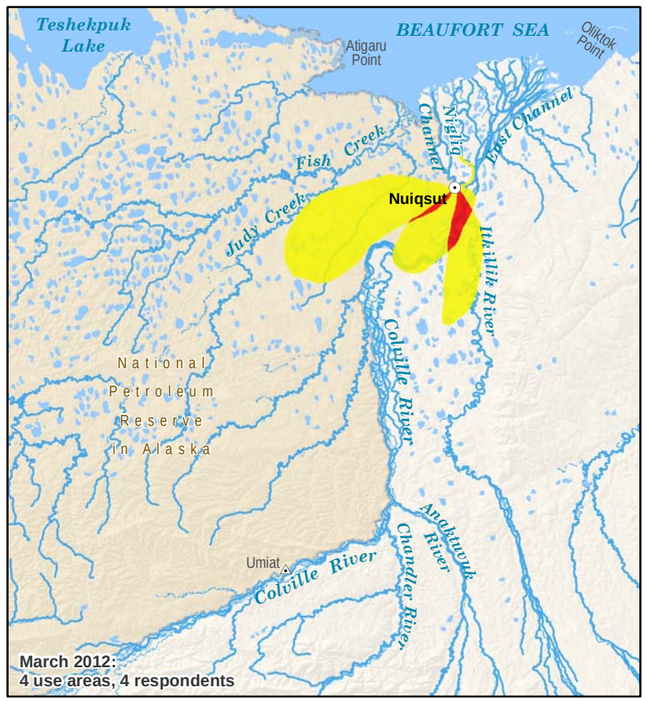
December 2011:
2 use areas, 2 respondents



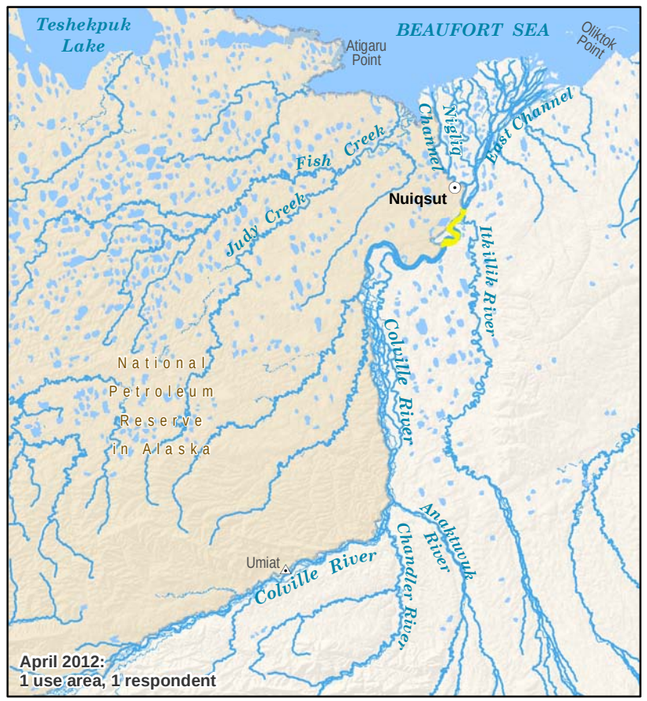
January 2012:
3 use areas, 3 respondents



February 2012:
4 use areas, 4 respondents



March 2012:
4 use areas, 4 respondents



April 2012:
1 use area, 1 respondent

Map 14
Caribou Subsistence Use Areas, November - April, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

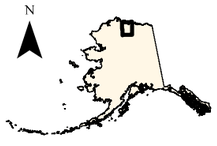
LEGEND

Overlapping Polygons

High

Low

National Petroleum Reserve Alaska



0 5 10 20
Miles

SCALE: 1:1,500,000

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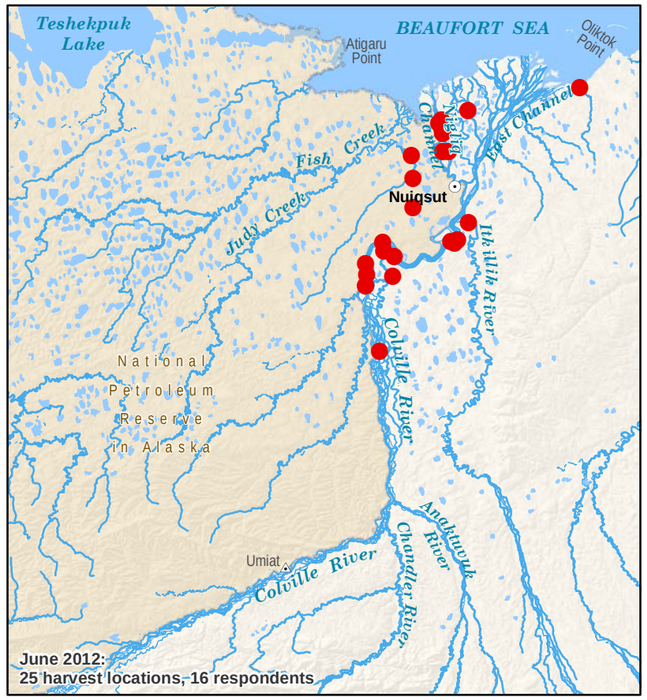
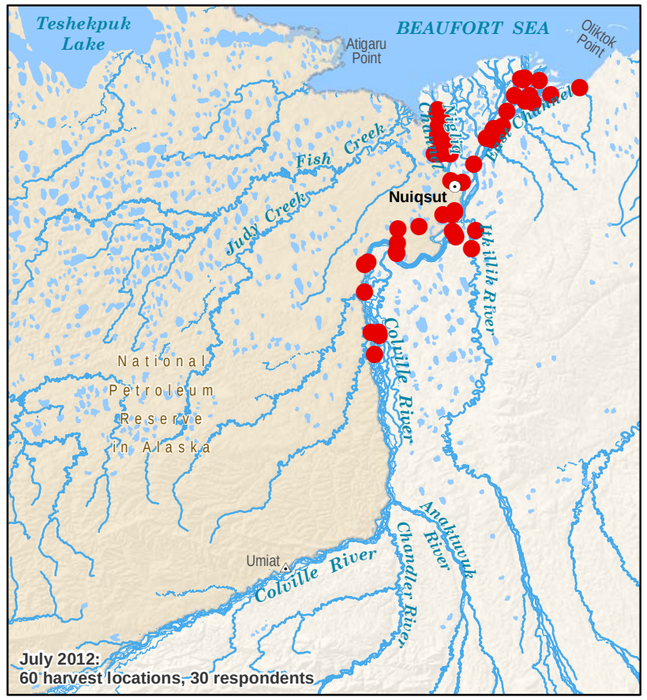
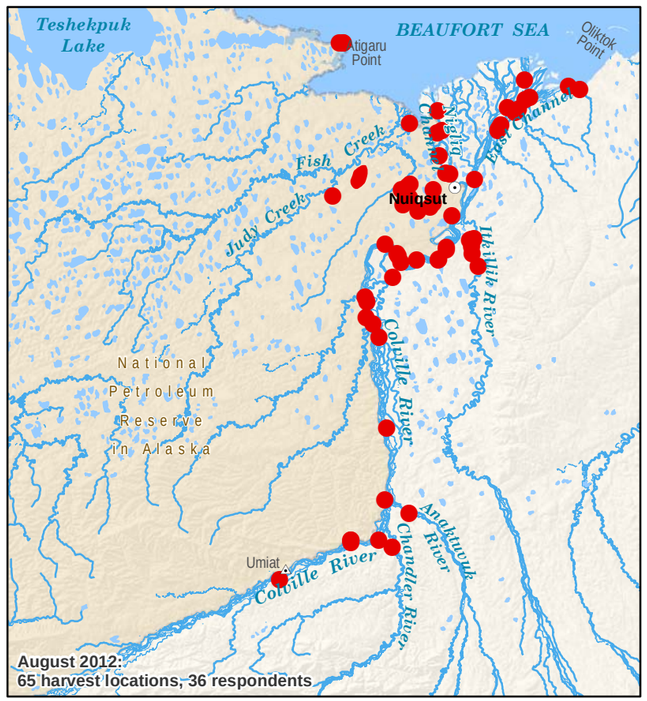
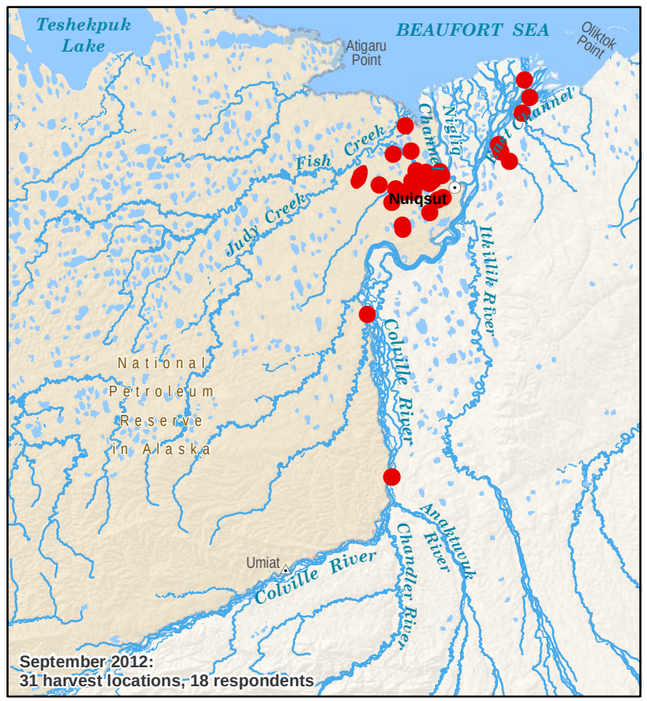
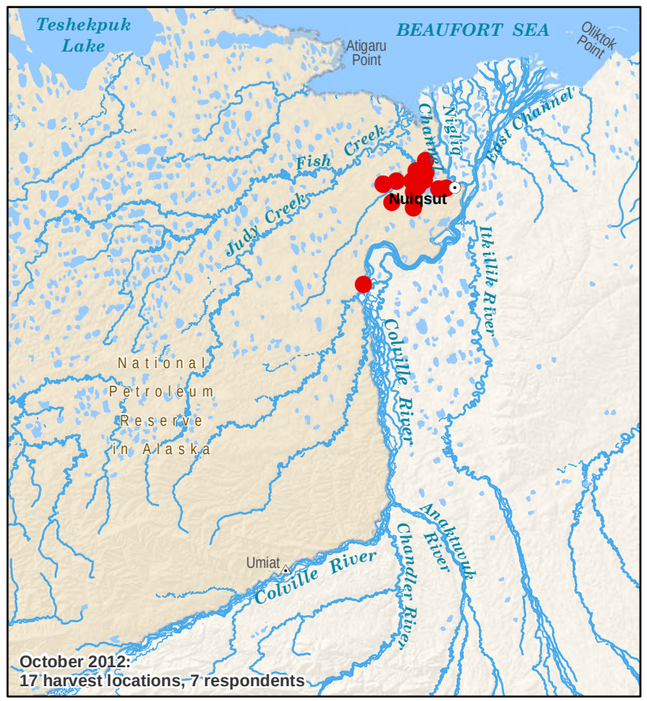










Map 15
Caribou Harvest Locations, May - October, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

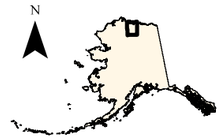
Other areas may have been used for resource harvesting.

LEGEND

Harvest Locations

All harvest locations are buffered at 1 mile radius (2 mile diameter)

National Petroleum Reserve Alaska



0 5 10 20
Miles

SCALE: 1:1,500,000

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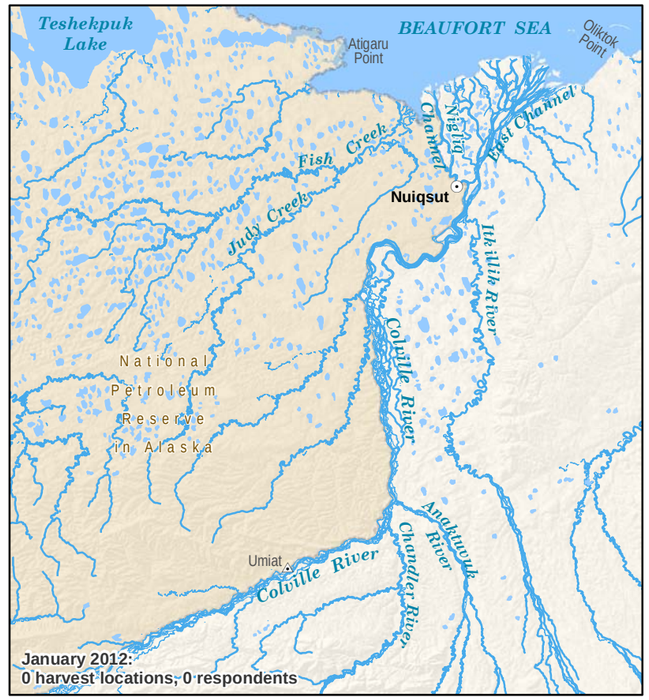
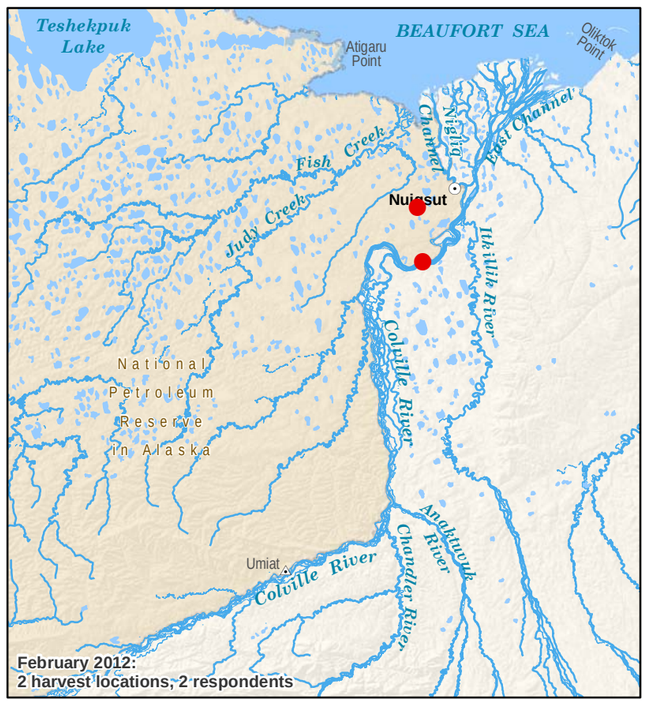
(907) 276-8222 srba@alaska.net

November 2011:
3 harvest locations, 3 respondents

December 2011:
0 harvest locations, 0 respondents



January 2012:
0 harvest locations, 0 respondents



February 2012:
2 harvest locations, 2 respondents

March 2012:
2 harvest locations, 2 respondents

April 2012:
0 harvest locations, 0 respondents

Map 16
Caribou Harvest Locations, November - April, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

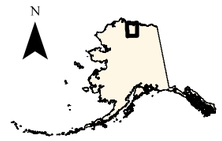
Other areas may have been used for resource harvesting.

LEGEND

Harvest Locations

All harvest locations are buffered at 1 mile radius (2 mile diameter)

National Petroleum Reserve Alaska



0 5 10 20
Miles

SCALE: 1:1,500,000

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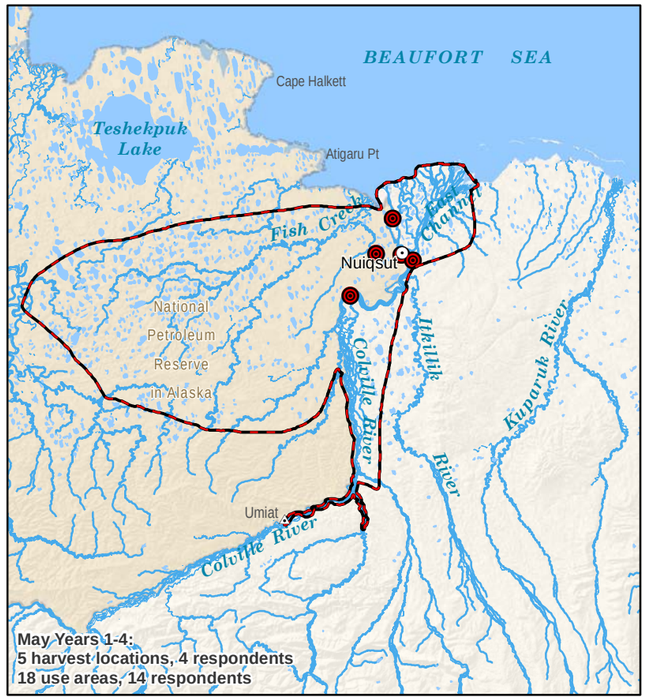
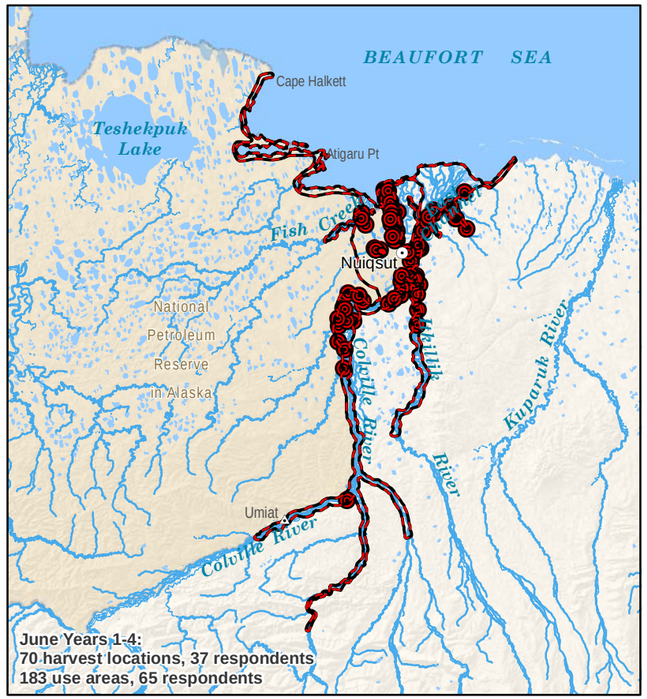
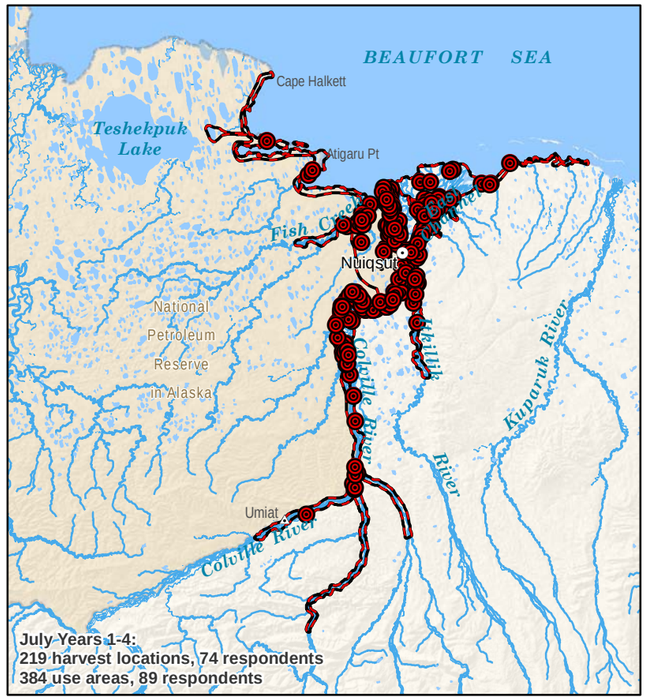
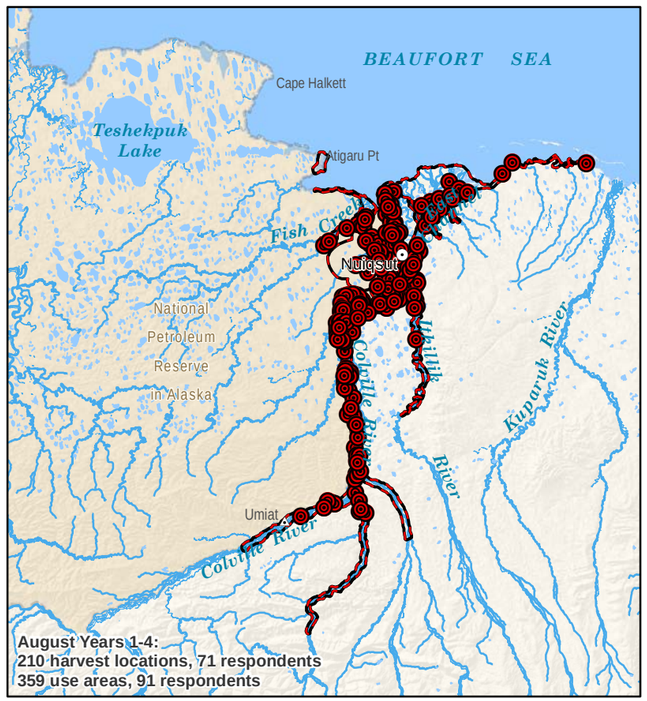
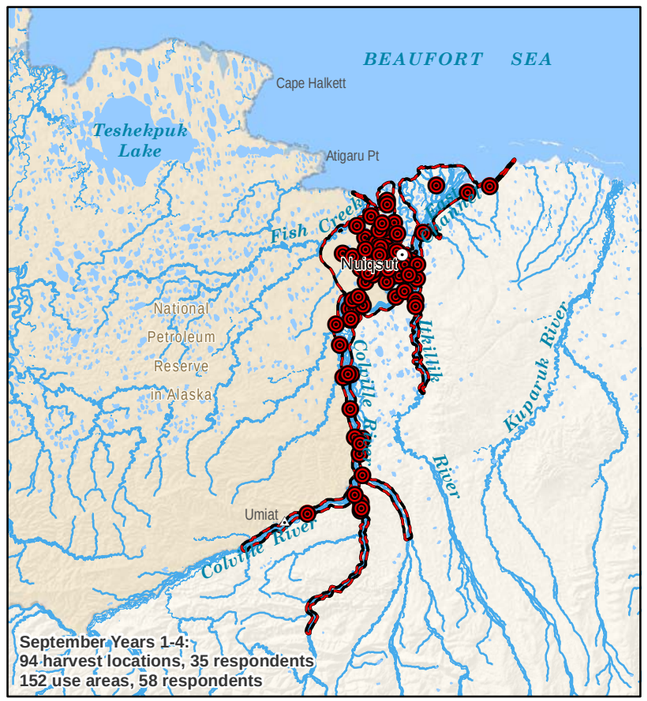
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

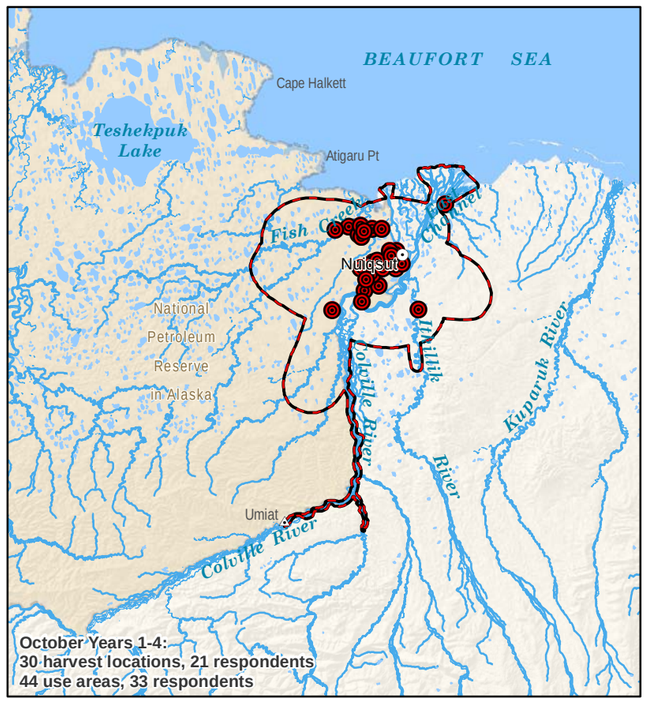












Map 17
Caribou Harvest Locations and Subsistence Use Areas, May - October, Years 1-4

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2012.

Other areas may have been used for resource harvesting.

LEGEND

Harvest Locations

Use Areas

National Petroleum Reserve Alaska

All harvest locations are buffered at 1 mile radius (2 mile diameter)

0 10 20 40
Miles

SCALE: 1:2,150,000

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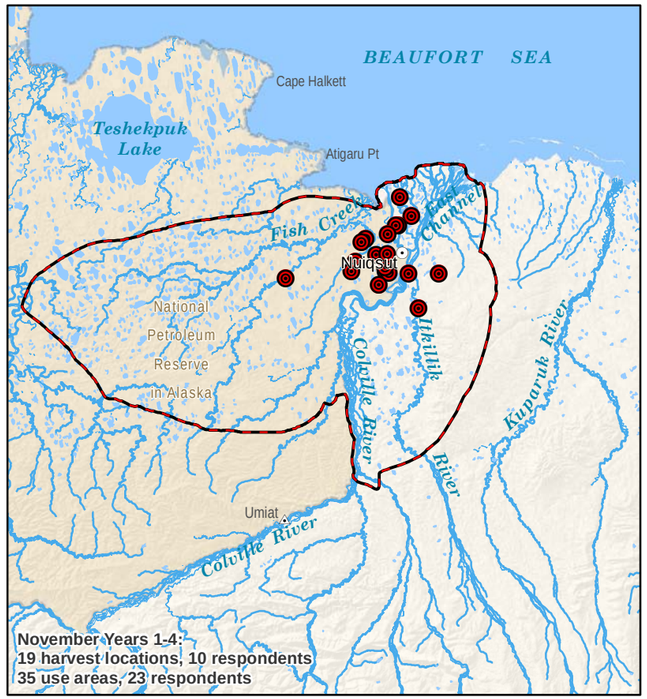
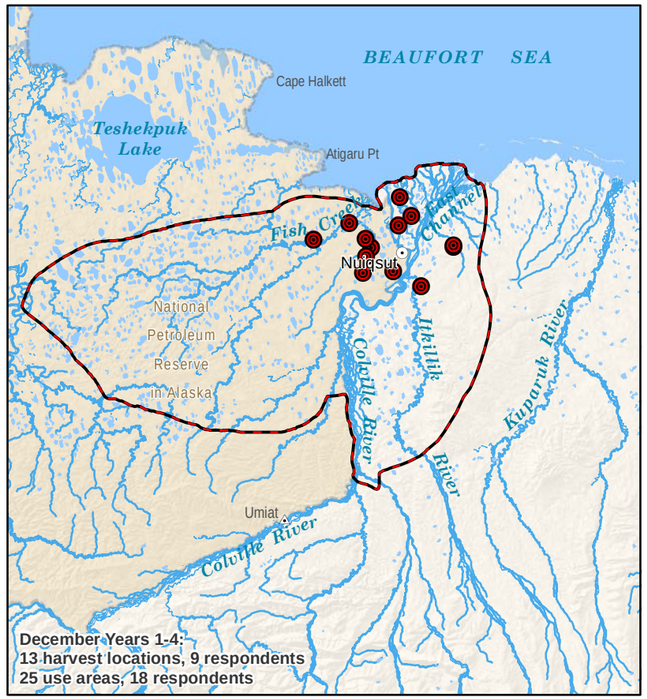
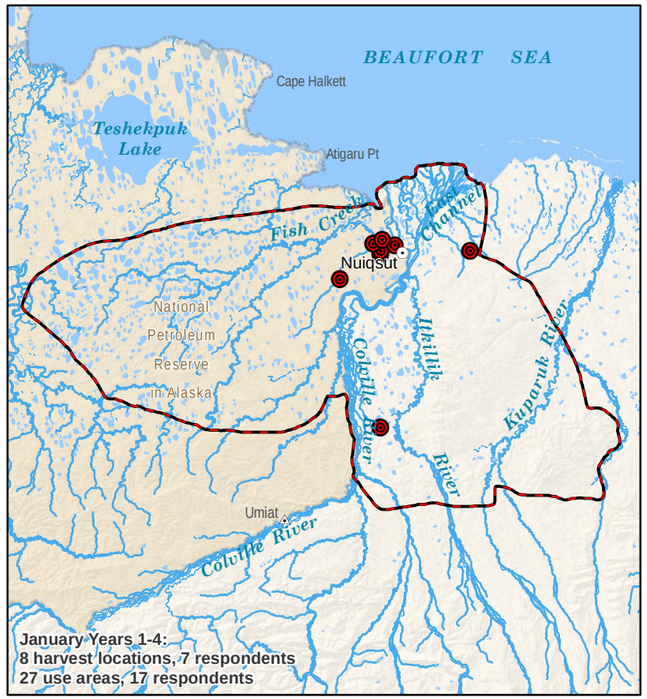
(907) 276-8222 srba@alaska.net



November Years 1-4:
19 harvest locations, 10 respondents
35 use areas, 23 respondents

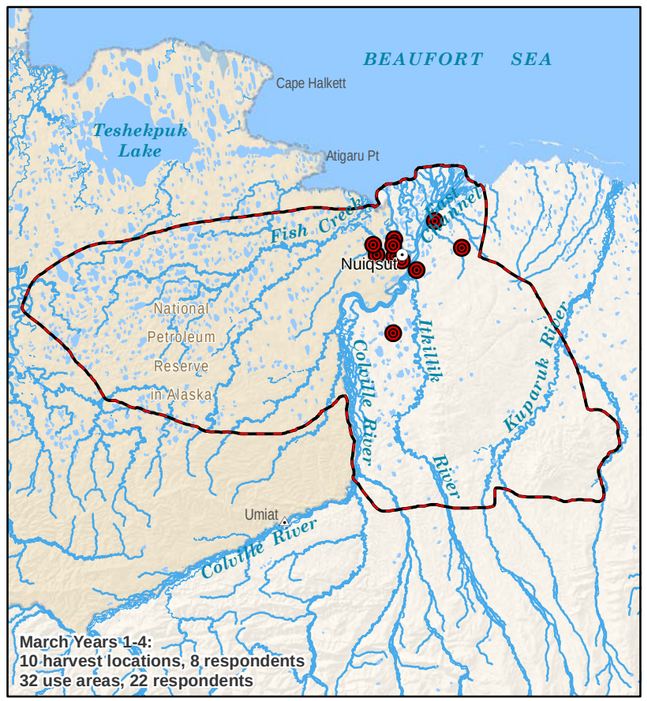


December Years 1-4:
13 harvest locations, 9 respondents
25 use areas, 18 respondents

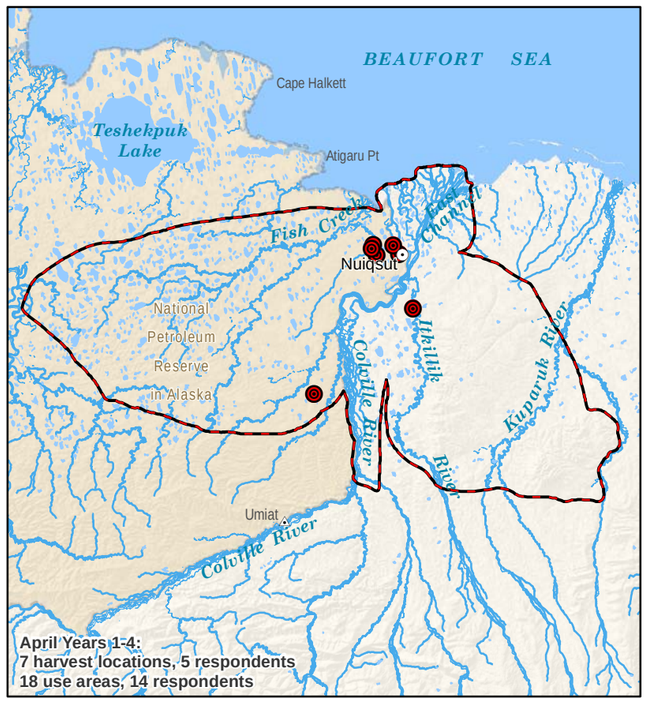


January Years 1-4:
8 harvest locations, 7 respondents
27 use areas, 17 respondents

February Years 1-4:
18 harvest locations, 10 respondents
40 use areas, 24 respondents



March Years 1-4:
10 harvest locations, 8 respondents
32 use areas, 22 respondents



April Years 1-4:
7 harvest locations, 5 respondents
18 use areas, 14 respondents

Map 18
Caribou Harvest Locations and Subsistence Use Areas, November - April, Years 1-4

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2012.

Other areas may have been used for resource harvesting.

LEGEND

Harvest Locations

Use Areas

National Petroleum Reserve Alaska

All harvest locations are buffered at 1 mile radius (2 mile diameter)

0 10 20 40
Miles

SCALE: 1:2,150,000

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

According to Year 5 active harvester interviews, during the months of January through March, residents traveled overland in a somewhat larger area by snowmachine, primarily in an areas south and west of the community extending to Ocean Point and around Itkillik River (Map 14). During the month of April, Year 5 active harvesters only reported utilizing a small area south of the community along the Colville River for caribou subsistence activities. Previous study years show respondents accessing areas as far west as the Ikpikpuk River, and southeast from the community beyond the Kuparuk River, areas not utilized by active harvester respondents during the winter months of Year 5 (Map 18). During Year 5, successful winter harvests were made near the community during November, February and March, with no successful harvests reported by active harvesters in December, January or April (Map 16). Residents have noted that their primary targets during winter snowmachine trips are wolf and wolverine, but that caribou are harvested as needed and available during these trips. Because of the focus on caribou in this study, it is likely that not all harvesters report these winter areas when asked to identify their caribou hunting areas.

Travel Method

Similar to previous study years, respondents reported boats as their principal mode of travel for caribou harvesting activities; 74 percent of caribou use areas in Year 5 were accessed by boat, followed by four-wheeler (17 percent), snowmachine (eight percent) and truck (one percent) (Table 10). Figures 3 through 5 show the percentage of boat, snowmachine and four-wheeler use areas reported by Nuiqsut respondents by month. During all study years, boat travel began as soon as the ice broke up in either May or June, and continued until September or October when the waterways iced over again. In terms of the number of use areas, the peak month for boat travel for Years 1, 2, and 3 was July, with Years 4 and 5 having a slightly later peak in August (Figure 3).

The later peak in boating activities for both Year 4 and Year 5 may be due to the timing of breakup. Snowmachine use by active harvesters generally occurs beginning in September through April or May depending on the weather. During Year 5, snowmachine use peaked in October and November followed by a decline during December, but remained fairly consistent throughout the remaining winter months (Figure 4). Four-wheeler use generally is limited to the summer and fall months although Year 5 respondents reported minimal four-wheeler use during the month of February, and an elevated use of four wheelers during the summer months compared to previous study years, with the peak use occurring in August. In Years 2 and 3, four-wheeler use areas peaked in September (Figure 5). Figure 6 shows the average number of use areas for all study years, by travel method and month. As also indicated in Table 10, boat is the primary method of travel used to access caribou hunting areas, with an average of 90 boat use areas reported for the month of July (Figure 6). Over all five study years four-wheeler use areas peaked in August and September, and snowmachine use areas peaked in October and November and again in February. On average, the number of four-wheeler and snowmachine use areas reported in any given month remained under 10.

Table 10: Travel Method to Caribou Subsistence Use Areas

Travel Method	Percent of Caribou Use Areas				
	Year 1	Year 2	Year 3	Year 4	Year 5
Boat	73%	81%	73%	79%	74%
Snowmachine	22%	9%	16%	12%	8%
Four-wheeler	4%	9%	9%	9%	17%
Truck	2%	2%	0%	0%	1%
Total	100%	100%	100%	100%	100%

Stephen R. Braund & Associates, 2014.

Figure 3: Boat Use by Month, Years 1-5

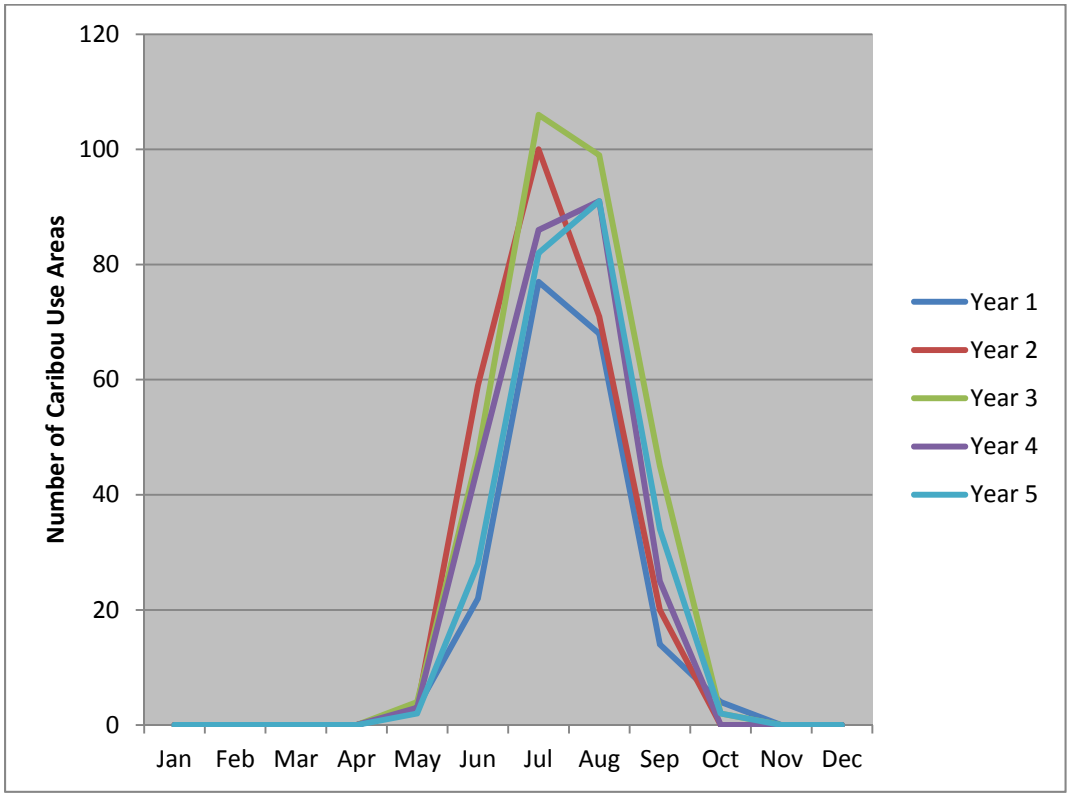


Figure 4: Snowmachine Use by Month, Years 1-5

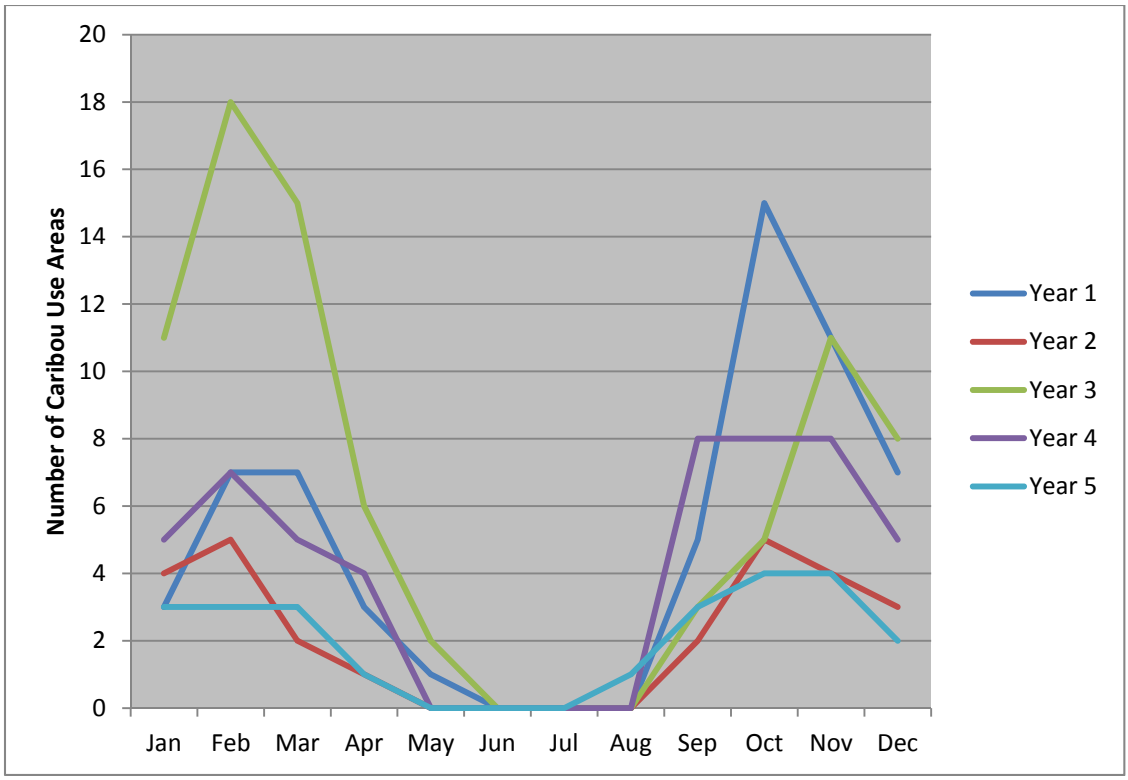


Figure 5: Four-wheeler Use by Month, Years 1-5

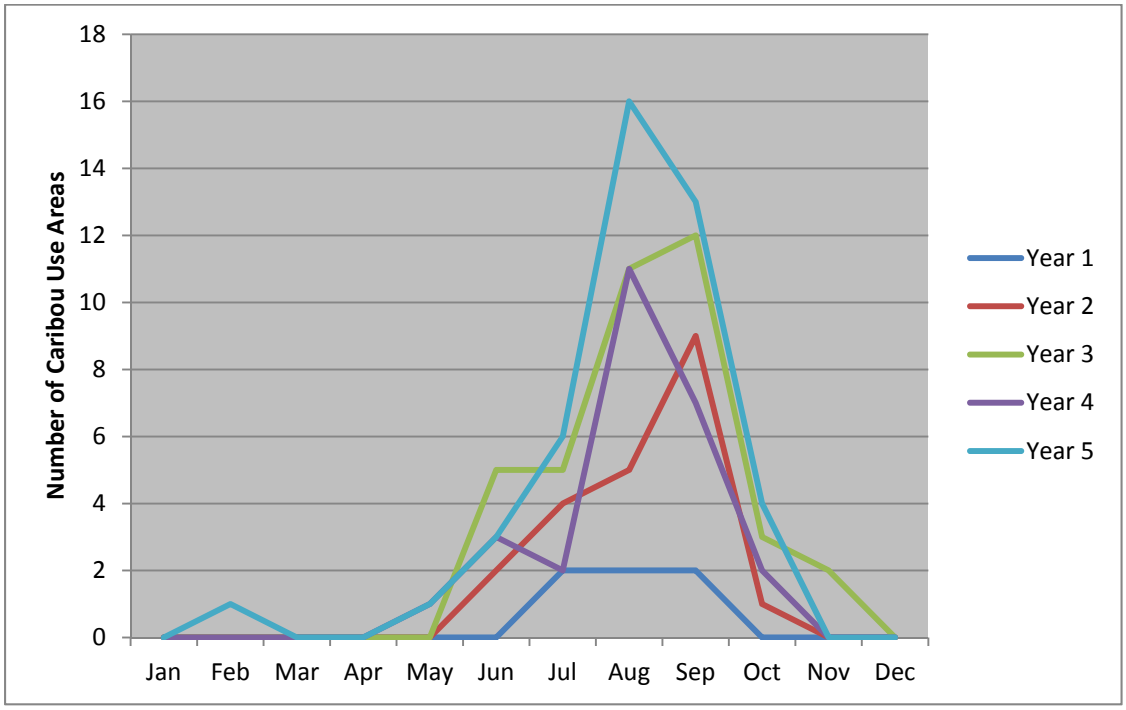
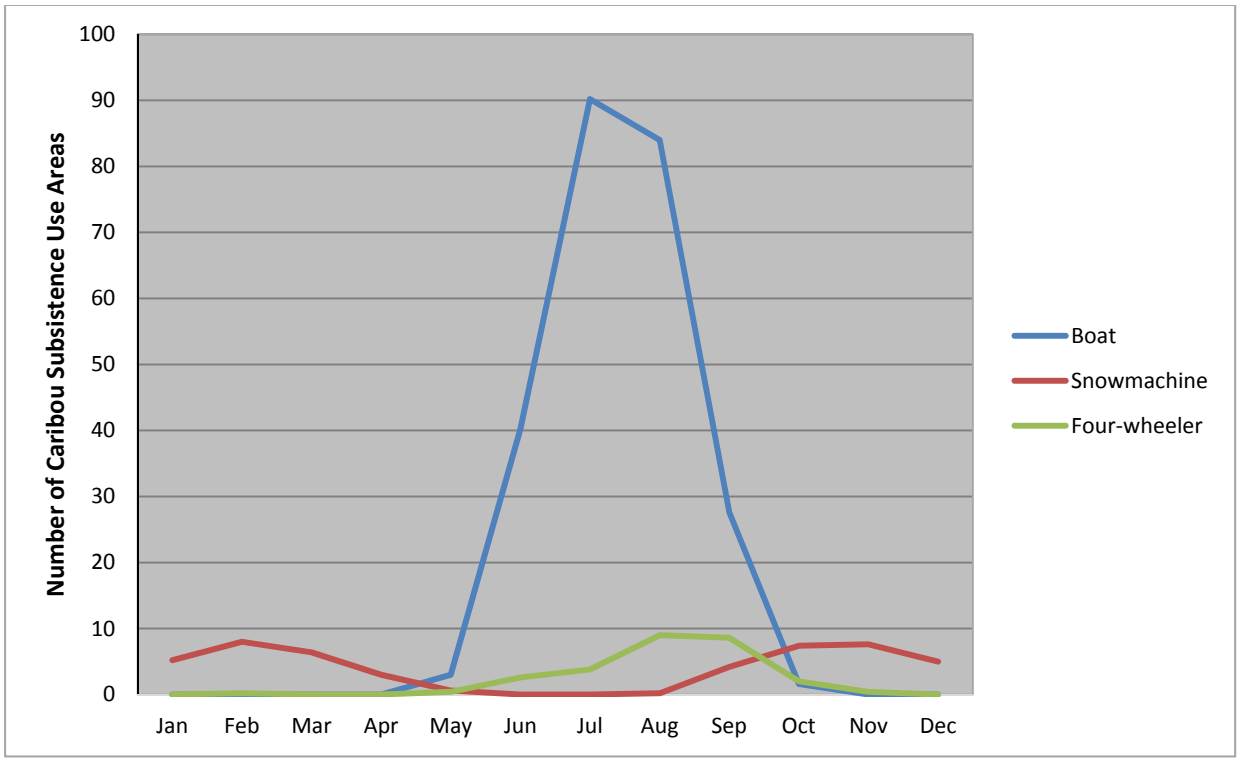


Figure 6: Average Number of Use Areas by Month and Travel Method, Years 1-5



As indicated in this and previous study years, transportation methods used for hunting activities are dependent on the time of year. The exact timing varies from year to year based on the timing of freezeup, breakup, and ice or snow conditions. Based on respondent observations, in Year 5 the rivers broke up in late June and they froze late September or early October. Multiple respondents provided the following details regarding the timing and method of transportation related to Year 5 caribou hunting activities:

> *The first one was June, the [ice on the] river broke, we went upriver and we spotted a caribou along the bank, here's Kitik River, [we caught caribou] along the bank between Ocean Point and here…. That was actually on June 30, a week after breakup. We actually got that caribou and we went up further didn't find any.* (SRB&A Nuiqsut Interview November 2012)

> *I go out by four-wheeler in the spring and fall, soon as the snow gets too thick I don't go [anymore].* (SRB&A Nuiqsut Interview November 2012)

> *This was in springtime I went [by snowmachine]. Before break up, sometime in May or end of March. Sometime around end of April or May. I went up river.* (SRB&A Nuiqsut Interview November 2012)

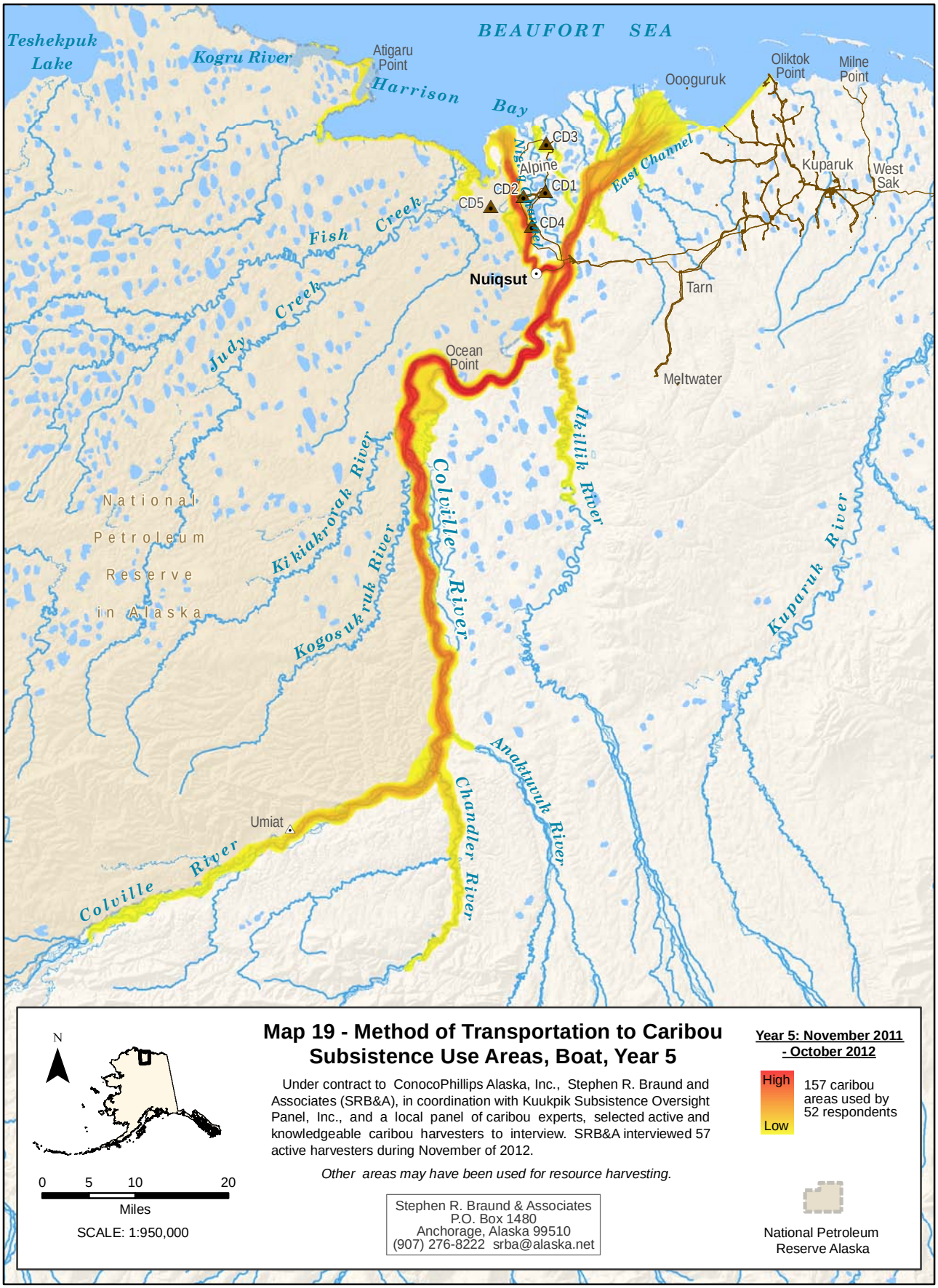
> *Just before freeze up we went up Nigliq area in a boat, and that was in the middle of September.* (SRB&A Nuiqsut Interview November 2012)

Caribou use areas by transportation method are shown on Maps 19 through 24. As shown on Map 19, boat travel in Year 5 occurred primarily along the Colville (including Nigliq Channel), Chandler, and Itkillik Rivers. A small amount of boat travel was reported along the coastal areas between Atigaru Point and Oliktok Point. Boat travel was heaviest along the Nigliq Channel and along the main Colville River between Pisiktaġvik and Sentinel Hill. When traveling along the Nigliq Channel, residents more generally reported use areas as far as Nigliq Camp, with some individuals traveling farther to the mouth of the river. A relatively low number of boating areas were reported in coastal areas and along Fish Creek, Chandler River, and upper Itkillik River when compared to boating areas as a whole. Year 5 boating areas were similar to previous study years (Map 20). Four-wheeler hunting areas are located west of the community and Nigliq Channel and, in Year 5, were generally located within 15 miles of the community (Map 21). Four-wheeler hunting occurred in a similar area during the previous study years (Map 22). Snowmachine hunting occurs over a larger area and sees the most variation from year to year. In Year 5, residents traveled past Fish Creek to the west by snowmachine and south past Ocean Point (Map 23). A few individuals traveled east of the community by snowmachine to Itkillik River and beyond to the south along the river. Residents have reported traveling greater distances by snowmachine both to the west and east of the community during previous study years (Map 24).

Harvest Success

The percentage of caribou use areas in which respondents reported successful harvests has dropped each study year with the exception of Year 5, from 78 percent in Year 1, 61 percent in Year 2, 58 percent in Year 3, 55 percent in Year 4, and then back up to 64 percent in Year 5 (Table 11). While overall harvest estimates have not dropped (see "Harvest Amounts") over the same time period, the data show that respondent harvests have been concentrated into a smaller percentage of their reported use areas. The percentage of respondents reporting successful and/or unsuccessful subsistence use areas was the same as in Year 3, and similar to Year 4.

Table 12 depicts the percentage of use areas that were successful for each travel method. Use areas accessed by four-wheeler show a slightly higher rate of success (69 percent of four-wheeler use areas) than use areas accessed by boat or snowmachine (62 percent and 63 percent, respectively). Only two truck use areas were reported, and both were successful. The slightly higher success rates for four-wheeler use areas may be due to residents being able to access the caribou directly, rather than waiting for them to approach riversides as they do when hunting by boat. While a number of snowmachine use areas are reported during the late fall (October), when the caribou are generally close to the community, others are reported during the winter when caribou are generally more dispersed and farther from the community.



Map 19 - Method of Transportation to Caribou Subsistence Use Areas, Boat, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

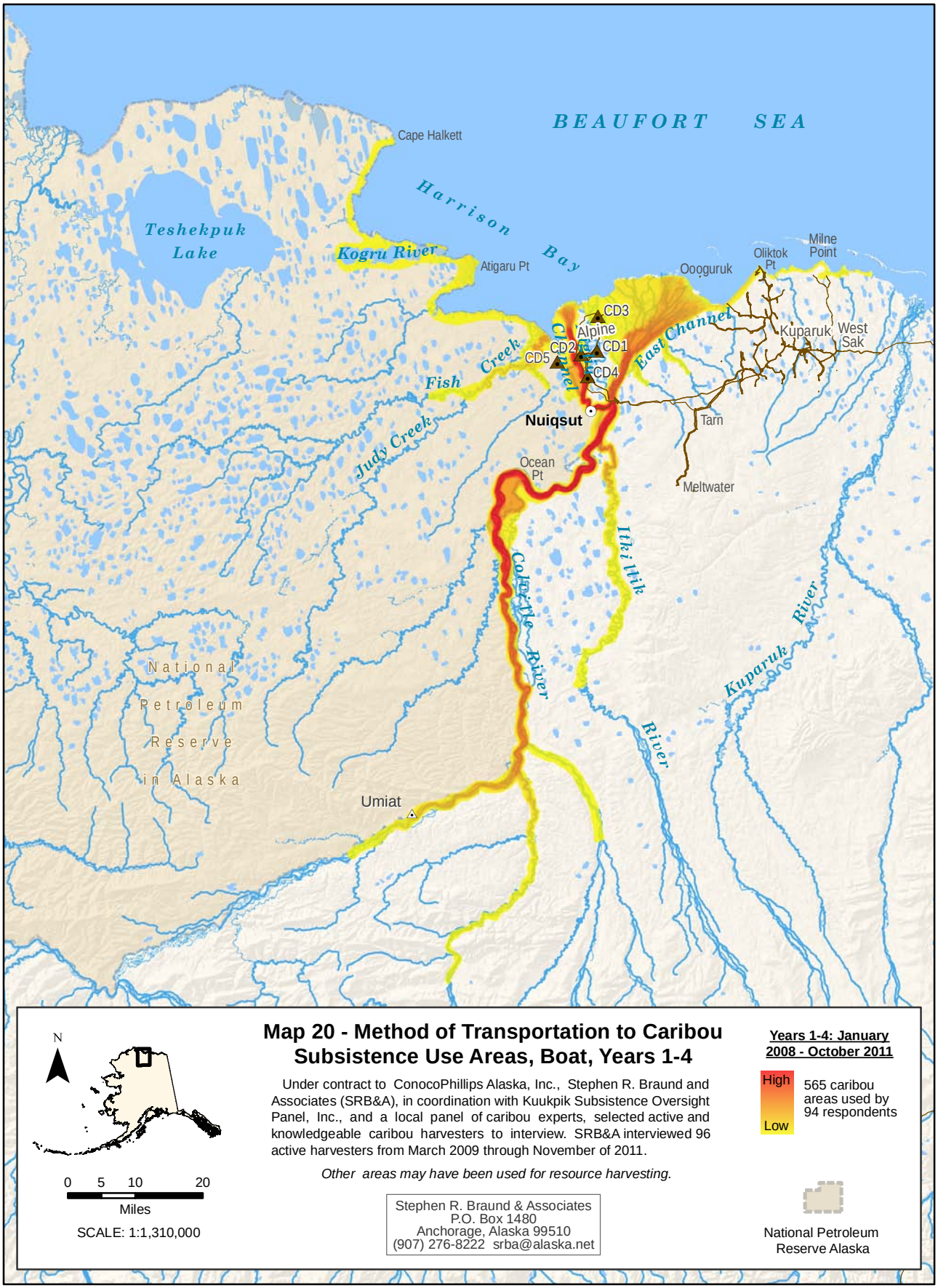
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

Year 5: November 2011 - October 2012

High
Low

157 caribou areas used by 52 respondents

National Petroleum Reserve Alaska



Map 20 - Method of Transportation to Caribou Subsistence Use Areas, Boat, Years 1-4

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.

Other areas may have been used for resource harvesting.

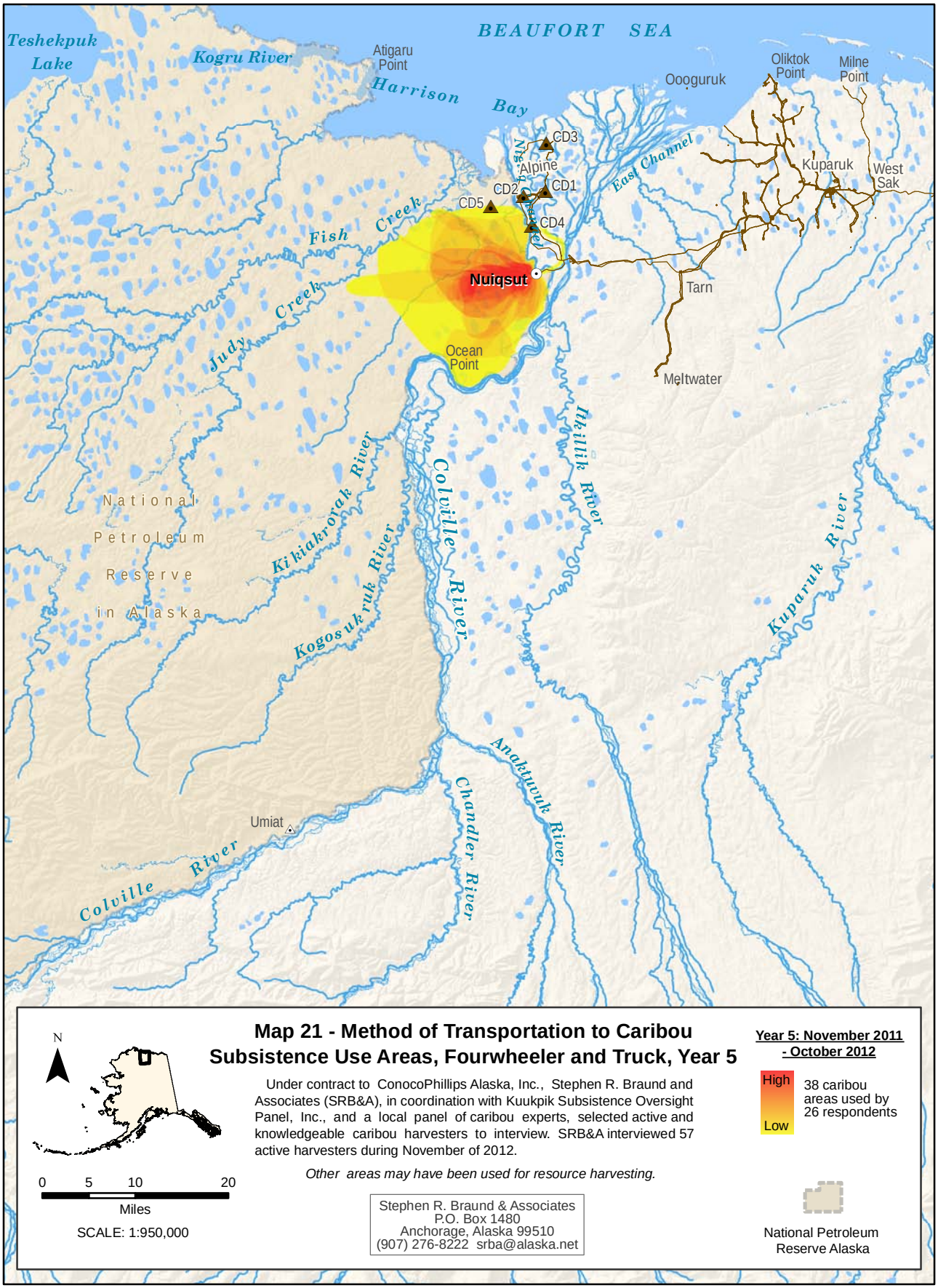
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net

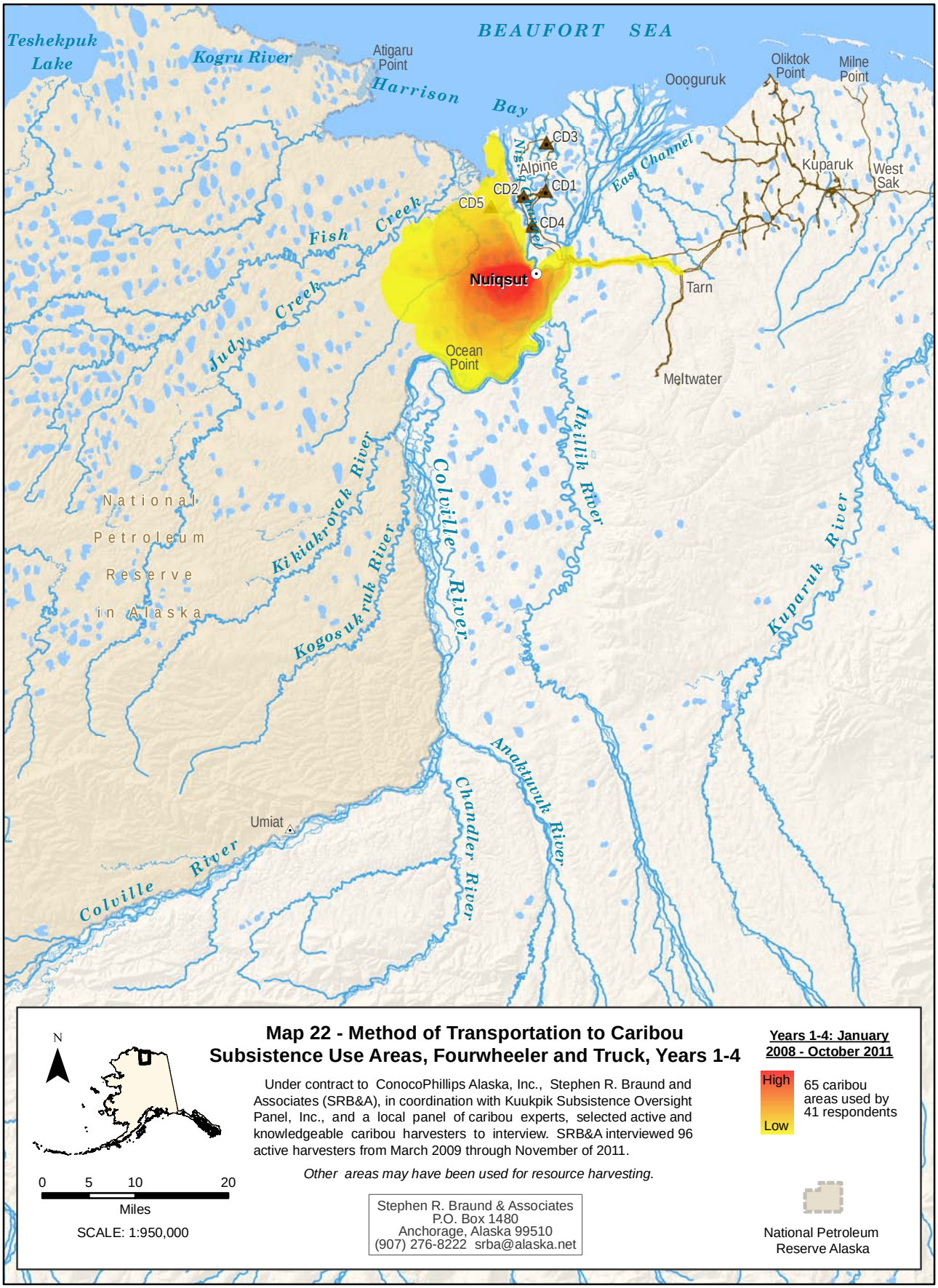
Years 1-4: January 2008 - October 2011

High
Low

565 caribou areas used by 94 respondents

National Petroleum Reserve Alaska


BEAUFORT SEA
Teshekpuk Lake
Kogru River
Atigaru Point
Harrison Bay
Oooguruk
Oliktok Point
Milne Point
CD3
Alpine
CD2
CD1
CD5
CD4
East Channel
Kuparuk
West Sak
Fish Creek
Judy Creek
Nuiqsut
Tarn
Ocean Point
Meltwater
Itkillik River
National Petroleum Reserve in Alaska
Kikiakrorak River
Colville River
Kogosukruk River
Kuparuk River
Anaktuvuk River
Chandler River
Umiat
Colville River
N
0 5 10 20
Miles
SCALE: 1:950,000
Map 21 - Method of Transportation to Caribou Subsistence Use Areas, Fourwheeler and Truck, Year 5
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.
Other areas may have been used for resource harvesting.
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
Year 5: November 2011 - October 2012
High
Low
38 caribou areas used by 26 respondents
National Petroleum Reserve Alaska



Map 22 - Method of Transportation to Caribou Subsistence Use Areas, Fourwheeler and Truck, Years 1-4

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.

Other areas may have been used for resource harvesting.

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

N

0 5 10 20
Miles

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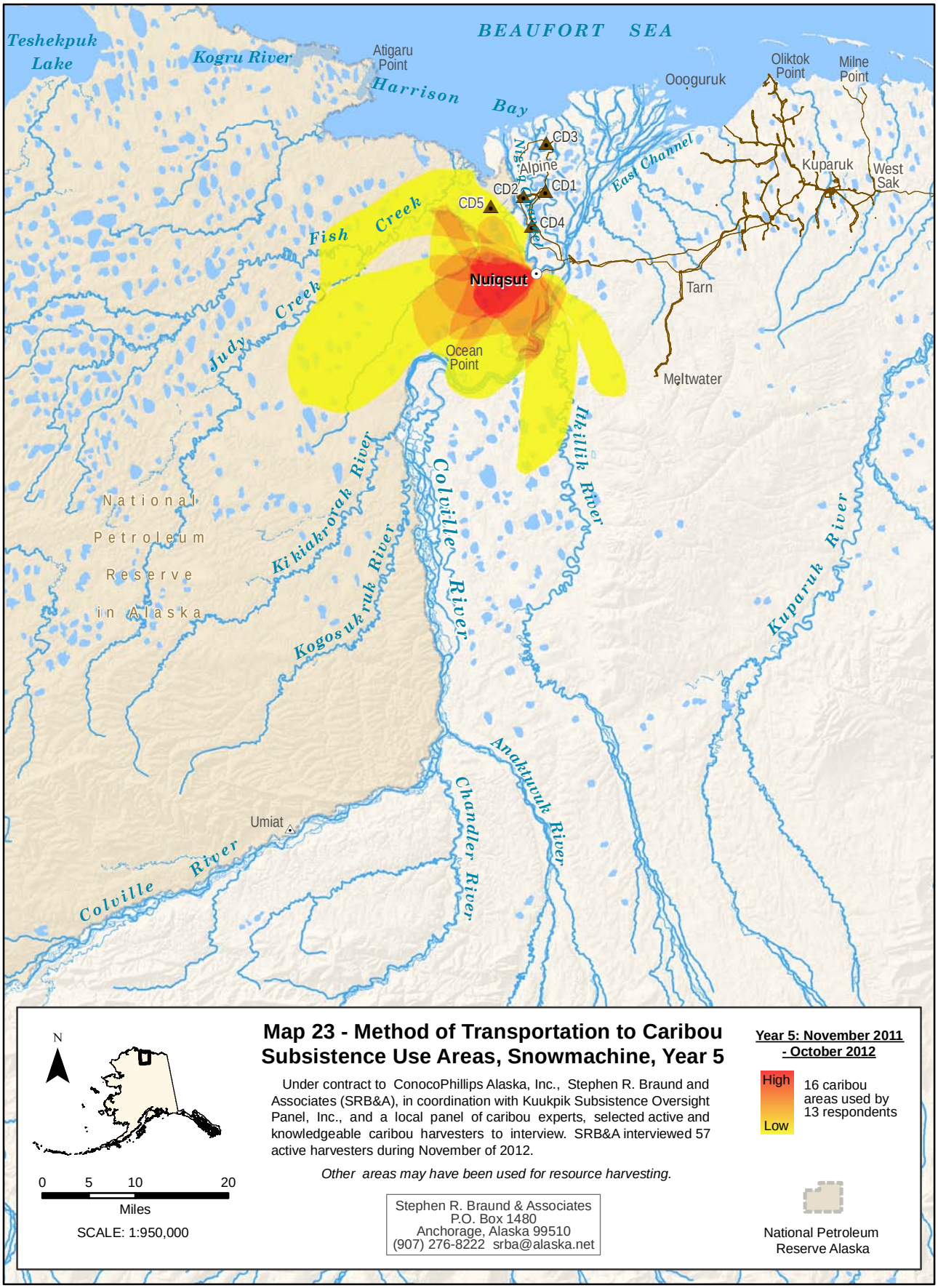
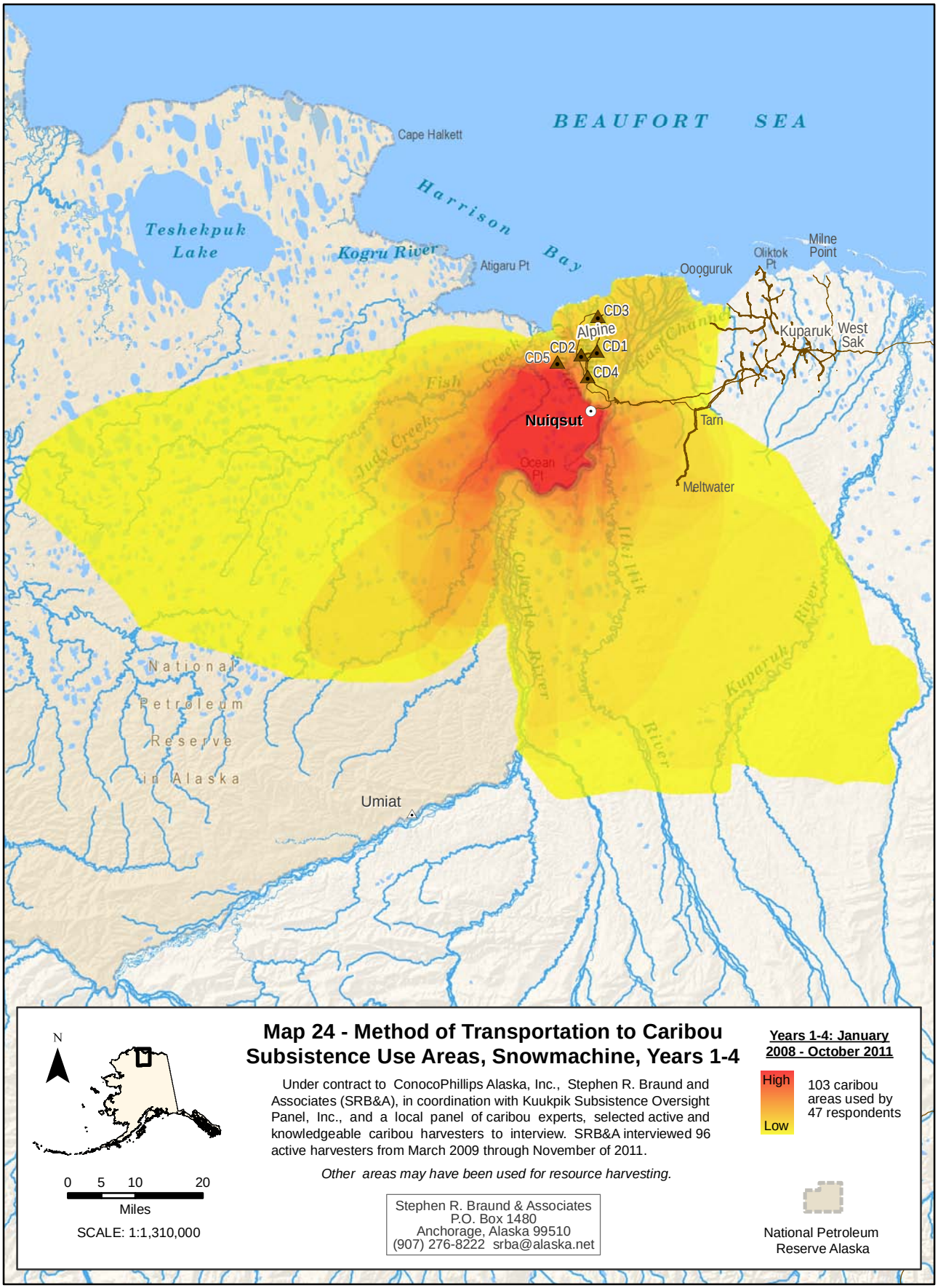
Years 1-4: January 2008 - October 2011

High
Low

65 caribou areas used by 41 respondents

National Petroleum Reserve Alaska


BEAUFORT SEA
Teshekpuk Lake
Kogru River
Atigaru Point
Harrison Bay
Oooguruk
Oliktok Point
Milne Point
CD3
Alpine
CD2
CD1
CD5
CD4
East Channel
Kuparuk
West Sak
Fish Creek
Judy Creek
Nuiqsut
Tarn
Ocean Point
Meltwater
Itkillik River
National Petroleum Reserve in Alaska
Kikiakrorak River
Colville River
Kogosukruk River
Kuparuk River
Anaktuvuk River
Chandler River
Umiat
Colville River
N
0 5 10 20
Miles
SCALE: 1:950,000
Map 23 - Method of Transportation to Caribou Subsistence Use Areas, Snowmachine, Year 5
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.
Other areas may have been used for resource harvesting.
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
Year 5: November 2011 - October 2012
High
Low
16 caribou areas used by 13 respondents
National Petroleum Reserve Alaska



Map 24 - Method of Transportation to Caribou Subsistence Use Areas, Snowmachine, Years 1-4

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 96 active harvesters from March 2009 through November of 2011.

Other areas may have been used for resource harvesting.

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

Years 1-4: January 2008 - October 2011

High
Low

103 caribou areas used by 47 respondents

National Petroleum Reserve Alaska

Table 11: Percentage of Caribou Use Areas in Which Respondents Reported Successful Harvests, Nuiqsut, Years 1-5

	% of Use Areas					% of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
No	22%	39%	42%	45%	36%	47%	68%	72%	76%	72%
Yes	78%	61%	58%	55%	64%	100%	89%	95%	93%	95%
Total Number of Use Areas/ Respondents	137	187	215	194	212	36	53	57	58	57
Chi Square p = .000[1][2]										
Notes: The percentage of respondents do not add up to 100 percent. This is because a single respondent may identify multiple use areas, including both successful and unsuccessful use areas.										

Stephen R. Braund & Associates, 2014.

Table 12: Percentage of Successful Use Areas by Travel Method, Year 5

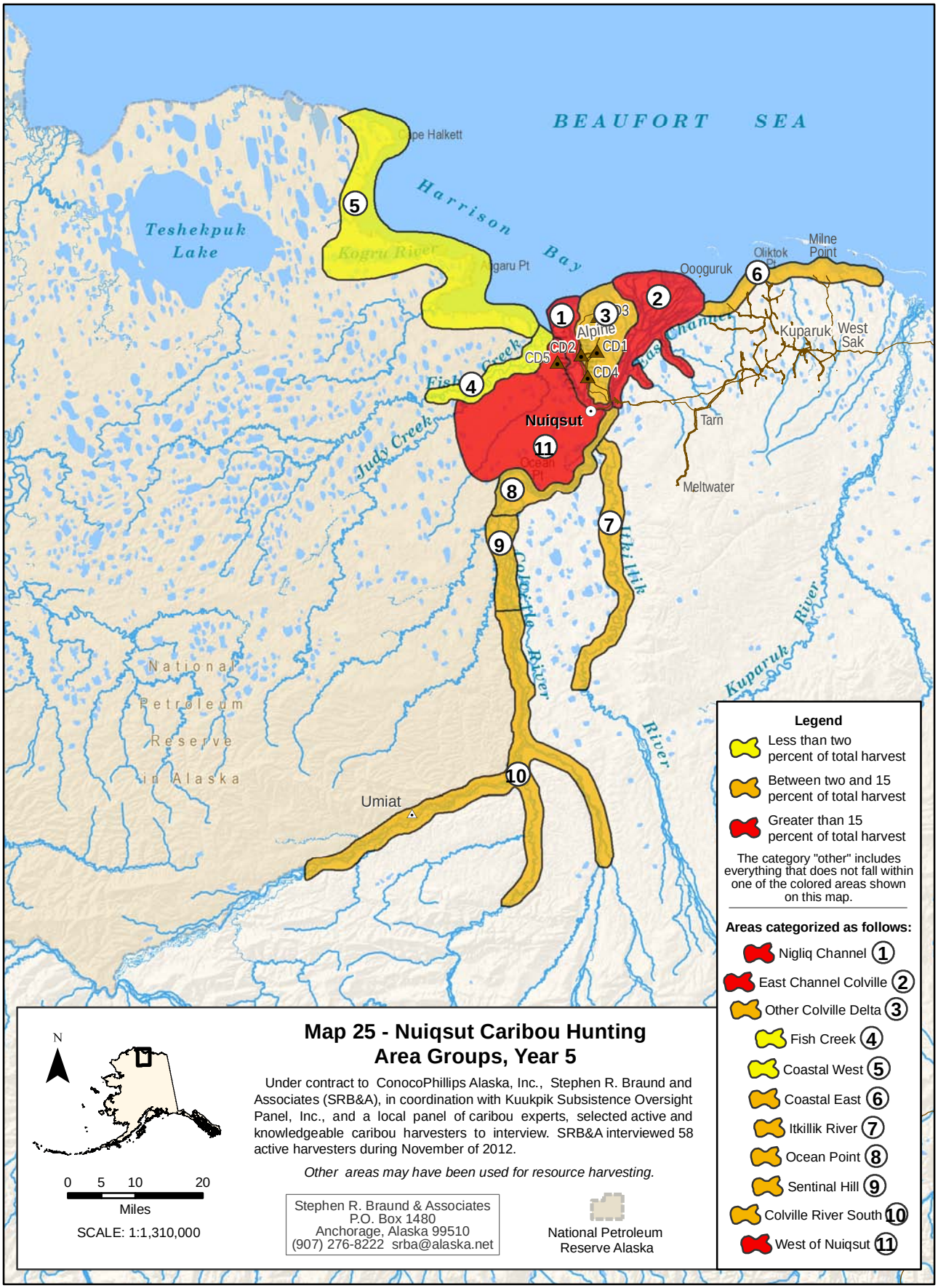
Travel Method	Number of Use Areas	Number (%) of Successful Use Areas
Boat	157	98 (62%)
Snowmachine	16	10 (63%)
Four-wheeler	36	25 (69%)
Truck	2	2 (100%)

Stephen R. Braund & Associates, 2014.

Table 13 reports the percentage of caribou harvest locations and the percentage of caribou harvested for each study year by 12 caribou hunting areas. The study team identified these 12 geographic caribou hunting areas based on residents' descriptions of those areas as separate hunting activities (e.g., Nigliq, Fish Creek, Coastal area west of Nuiqsut, upriver to Sentinel Hill, upriver to Umiat) (see Map 25). Map 25 depicts the geographic boundary of each hunting area group and categorizes each area as yellow, orange, or red (the "Other" category does not have a geographic boundary but, rather, includes all areas outside the other 11 hunting area groups). The yellow areas represent the smallest percentage of the total caribou harvest (less than 2 percent), the orange areas represent the next largest percentage of the total caribou harvest (between two and 15 percent), and the red areas represent the largest percentage of the total caribou harvest (15 percent or more).

During Year 5, the area west of Nuiqsut (Area 11) accounted for the highest portion (34 percent) of the caribou harvested, higher than in most previous years but less than in Year 4: 40 percent of harvests occurred in this area in Year 4, 30 percent in Year 3, 17 percent in Year 2 and 18 percent in Year 1 (Table 13). The East Channel (Area 2) was the second most productive hunting area, with 20 percent of the total caribou harvest, followed by Nigliq Channel (Area 1) with 15 percent of the total harvest. Ocean Point (Area 8) had the next highest harvest totals with 11 percent (a lower percentage than in previous years), followed by Coastal East and Itkillik River (Areas 6 and 7) with four percent each, and Sentinel Hill and Colville River South (Areas 9 and 10), which each accounted for three percent of the total reported caribou harvests.

[2] The p value can be interpreted as the probability that the observed differences could have occurred due to chance. A low p value (e.g., <.05) indicates that the differences between study years are not as likely due to chance.



Map 25 - Nuiqsut Caribou Hunting Area Groups, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 58 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

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National Petroleum Reserve Alaska

Table 13: Percentage of Caribou Harvest Locations and Caribou Harvests by Caribou Hunting Area

		Percentage of Caribou Harvest Locations					Percentage of Total Caribou Harvests				
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
1	Nigliq Channel	19%	18%	16%	17%	15%	23%	22%	18%	15%	15%
2	East Channel Colville	8%	8%	8%	12%	17%	8%	8%	7%	10%	20%
3	Other Colville Delta	2%	1%	2%	1%	1%	2%	1%	1%	1%	2%
4	Fish Creek	8%	7%	1%	1%	1%	7%	7%	1%	2%	0%
5	Coastal West	1%	0%	1%	0%	2%	1%	0%	1%	0%	1%
6	Coastal East	3%	0%	1%	1%	1%	3%	0%	1%	1%	4%
7	Itkillik River	7%	4%	5%	7%	5%	6%	4%	5%	4%	4%
8	Ocean Point	22%	23%	21%	19%	16%	17%	20%	15%	17%	11%
9	Sentinel Hill	9%	10%	8%	8%	6%	9%	9%	7%	5%	3%
10	Colville River South	4%	11%	10%	4%	6%	3%	11%	7%	4%	3%
11	West of Nuiqsut	14%	17%	23%	30%	30%	18%	17%	30%	40%	34%
12	Other	3%	1%	6%	1%	1%	3%	1%	6%	1%	1%
	Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Stephen R. Braund & Associates, 2014.

Harvests on the East Channel of the Colville River have risen during the last two study years, from eight percent in Year 1 to 20 percent in Year 5 (Table 13). Harvests along the Nigliq Channel were lowest during Years 4 and 5, accounting for 15 percent of the harvest during those two study years, compared to 23 percent, 22 percent, and 18 percent in Years 1 through 3, respectively. As shown on Map 25, three areas close to the community of Nuiqsut (Nigliq Channel, West of Nuiqsut and East Channel of the Colville) accounted for the majority (69 percent) of reported caribou harvests during Year 5. Those areas, in addition Ocean Point accounted for the 80 percent of caribou harvested (Table 13).

Table 14 shows the number of harvest locations by the number of caribou harvested for study years 1-5. In general, respondents reported harvesting fewer than 10 caribou at any given harvest location. In the majority of cases, respondents reported harvesting either one or two caribou at a single harvest location. In Year 5, 185 of the 195 harvest locations (96%) represented harvests of four or fewer caribou. The number of locations where respondents harvested a single caribou was highest in Year 5 (120 harvest locations or 62 percent) compared to all previous study years (between 36 percent and 52 percent of harvest locations).

Duration of Trips

The typical duration of caribou hunting trips has maintained a similar pattern across all five years. Residents typically take day trips to at least 81 percent of their caribou hunting areas (88 percent in Year 5) (Table 15). Residents took trips lasting between two and six nights to at least seven percent of caribou use areas during each study year (nine percent in Year 5). Residents also reported the longest trip they took to each area during the study year (Table 16). In Year 5, residents reported that they took solely same day trips to 85 percent of their caribou use areas. At 11 percent of Year 5 use areas, respondents reported that their longest trip lasted between two and six nights, and at two percent of use areas, residents' longest trip lasted between one and two weeks.

Table 14: Number of Caribou Harvested by Number of Harvest Locations, Years 1-5

Number of Caribou Harvested	Number (%) of Harvest Locations				
	Year 1	Year 2	Year 3	Year 4	Year 5
1	95 (52%)	75 (49%)	99 (51%)	58 (36%)	120 (62%)
2	44 (24%)	48 (32%)	60 (31%)	47 (29%)	40 (21%)
3	19 (10%)	16 (11%)	22 (11%)	19 (12%)	16 (8%)
4	7 (4%)	8 (5%)	7 (4%)	17 (10%)	9 (5%)
5	13 (7%)	4 (3%)	5 (3%)	10 (6%)	4 (2%)
6	1 (1%)	1 (1%)	2 (1%)	6 (4%)	4 (2%)
7	2 (1%)	0	0	1 (1%)	0
8	0	0	0	2 (1%)	0
9	0	0	0	1 (1%)	1 (1%)
10	0	0	0	1 (1%)	0
11	0	0	0	1 (1%)	1 (1%)

Stephen R. Braund & Associates, 2014

Table 15: Caribou Hunting Typical Trip Duration, Nuiqsut, Years 1-5

	Year 1	Year 2	Year 3	Year 4	Year 5
More than 2 weeks	0%	1%	0%	0%	0%
1-2 Weeks	1%	1%	1%	1%	1%
2-6 Nights	7%	15%	7%	8%	9%
1 Night	5%	2%	2%	1%	2%
Same Day	87%	81%	90%	90%	88%
Total	100%	100%	100%	100%	100%
Number of Trips	135	176	212	193	210
Chi Square p = .028					

Stephen R. Braund & Associates, 2014.

Table 16: Caribou Hunting Longest Trip Duration, Years 1-5

	Year 1	Year 2	Year 3	Year 4	Year 5
More than 2 weeks	1%	2%	0%	0%	0%
1-2 Weeks	3%	6%	4%	3%	2%
2-6 Nights	20%	24%	12%	12%	11%
1 Night	6%	5%	4%	4%	2%
Same Day	70%	63%	80%	81%	85%
Total	100%	100%	100%	100%	100%
Number of Trips	97	163	211	193	209
Chi Square p = .011					

Stephen R. Braund & Associates, 2014.

The percentage of use areas where the longest trip was a day trip is slightly higher than previous years and follows a slight trend of an increasing percentage of same day trips. The percentage of use areas where the longest trip was at least two nights continued to decline, at 13 percent, compared to the peak of 32 percent in Year 2, 16 percent in Year 3 and 15 percent in Year 4 (Table 16).

Map 26 depicts use areas where respondents reported staying for one or more nights, and Map 27 depicts use areas where respondents reported taking same day trips. The red areas depict higher number of overlapping use areas on each map and do not reflect differences in trip length. As shown in Map 26, respondents mostly commonly reported taking overnight trips when traveling upriver by boat from the community, particularly when traveling as far as the Chandler River or Umiat. Respondents rarely reported taking overnight trips in areas downriver from the community such as Nigliq Channel or the East Channel of the Colville River. No overnight trips were reported during overland (i.e., snowmachine or four-wheeler) trips. Same day trips more commonly occurred in overland areas to the west of the community, along the Nigliq and East Channels, in Itkillik River and upriver to Sentinel Hill. In general, resource availability, distance from the community, harvest season, and associated subsistence activities are the primary reasons given for camping trips versus day trips. Several individuals observed,

> *Certain times were just to Ocean Point and then Sentinel Hill. [We went into Chandler] just the one time. That was in September. That was a camping trip, four days. That was Labor Day weekend, I believe.* (SRB&A Nuiqsut Interview November 2012)

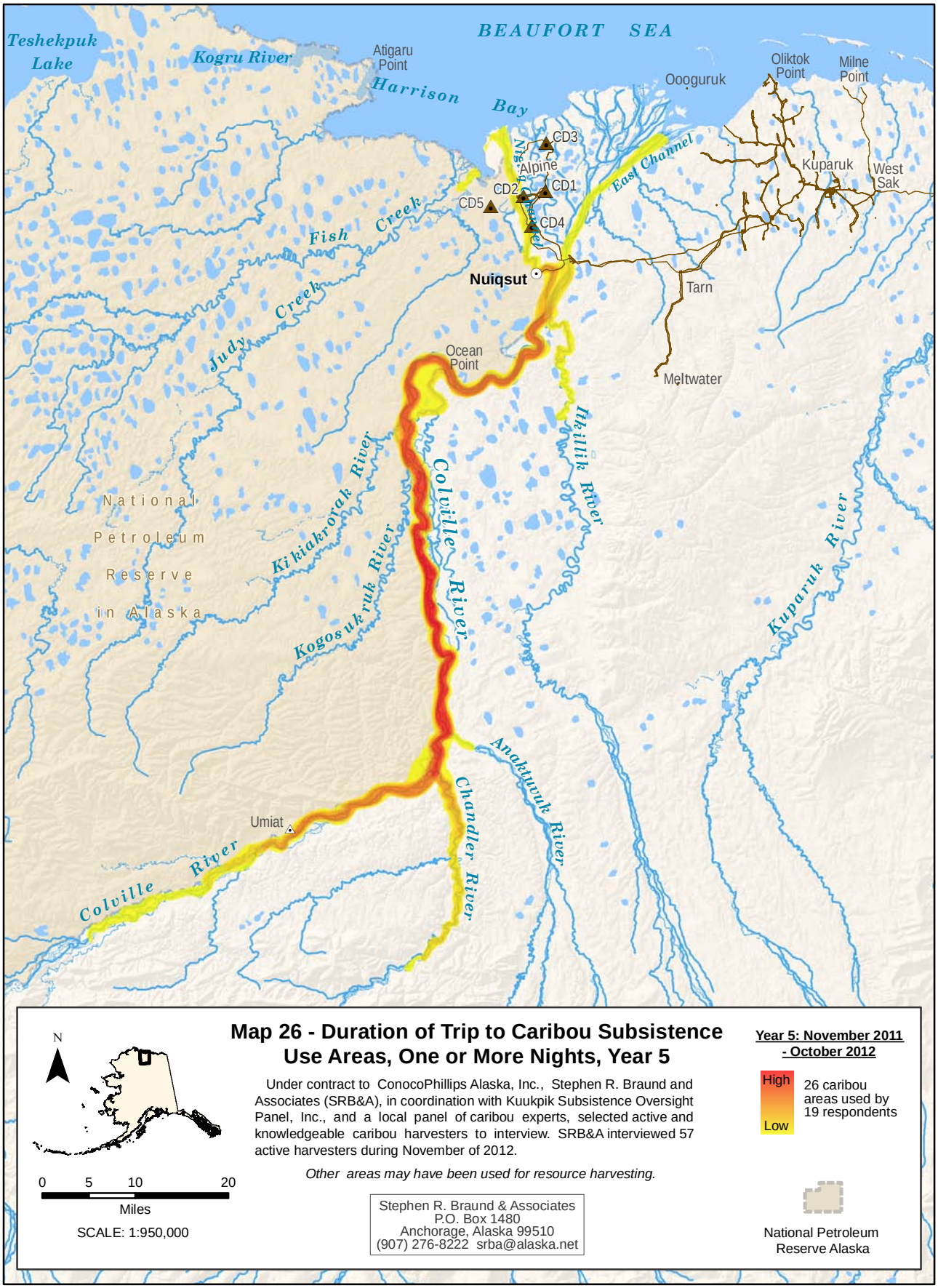
> *I stay at Nigliq River. The last cabin at the waypoint is my mother's so that's where I'm always at. When I was younger I used to [go up the side channel] but it's just a waste. I'd say at least 30 times? Yeah, I do a lot of camping over there, because that's where I do my fishing. Longest I was up there for was two weeks. Only time when I really go back is when I need supplies. From after the river clears up, May – no, June – what am I talking about May? It's still frozen! All through the summer then. Last trip was September.* (SRB&A Nuiqsut Interview November 2012)

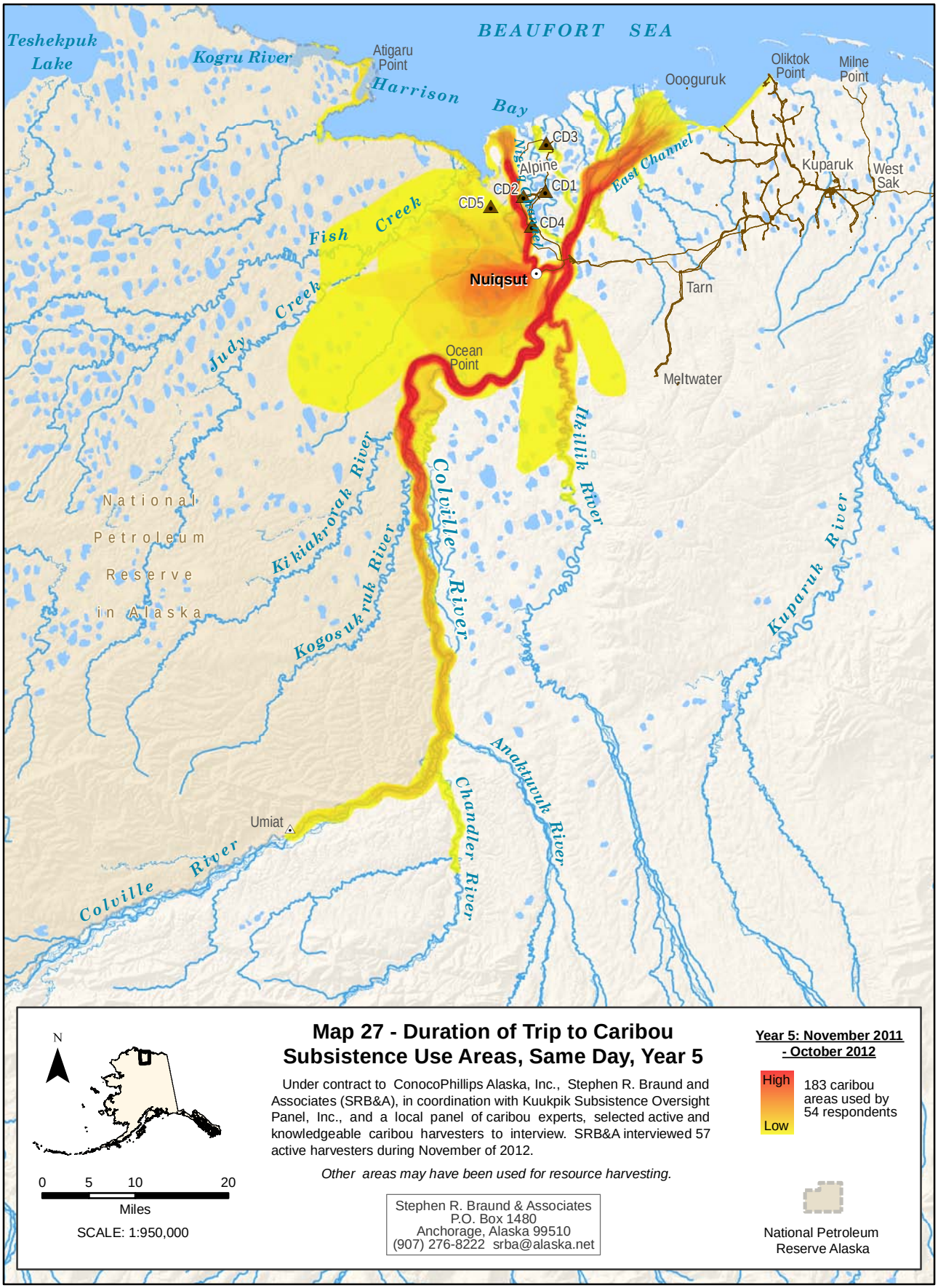
> *Twice [I went] all the way to Umiat; we camped out five days. Both [were] five day trips. And we went to the mouth of Chandler and we camped there. That was the second time I went, of the two times I went this far. It wasn't just right here for five days it was along this [whole] channel.* (SRB&A Nuiqsut Interview November 2012)

> *Just once up Itkillik. Just a day trip, no camping, we go home the same day, that time of the year it doesn't get dark [so you don't have to camp out]. It was the first week in July in Itkillik.* (SRB&A Nuiqsut Interview November 2012)

Frequency of Trips

The distribution of the number of trips taken to caribou use areas remained relatively consistent over the first four study years with about 20 percent of caribou use areas in each of the following reporting category: 1 trip, 2-3 trips, 4-5 trips, and 6-20 trips. During Year 5, a slightly larger percent of use areas were visited between one and three times (32 percent 1 trip, and 34 percent 2-3 trips). Nuiqsut active harvesters were more likely to take more than 20 trips to a caribou use areas in Year 3, 4 and 5 with nine, seven and four percent of use areas, respectively, compared to zero percent during Years 1 and 2 (Table 17). Year 5 shows the lowest percentage of use areas visited six to 20 times during the study year (16 percent, compared to between 28 and 35 percent during previous years).


BEAUFORT SEA
Teshekpuk Lake
Kogru River
Atigaru Point
Harrison Bay
Oooguruk
Oliktok Point
Milne Point
CD3
Alpine
CD1
CD2
CD5
CD4
Nigliq Channel
East Channel
Kuparuk
West Sak
Fish Creek
Judy Creek
Nuiqsut
Tarn
Ocean Point
Meltwater
Itkillik River
Kikiakrorak River
Colville River
National Petroleum Reserve in Alaska
Kogosukruk River
Kuparuk River
Anaktuvuk River
Chandler River
Umiat
Colville River
N
0 5 10 20
Miles
SCALE: 1:950,000
Map 26 - Duration of Trip to Caribou Subsistence Use Areas, One or More Nights, Year 5
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.
Other areas may have been used for resource harvesting.
Stephen R. Braund & Associates
P.O. Box 1480
Anchorage, Alaska 99510
(907) 276-8222 srba@alaska.net
Year 5: November 2011 - October 2012
High
Low
26 caribou areas used by 19 respondents
National Petroleum Reserve Alaska



Map 27 - Duration of Trip to Caribou Subsistence Use Areas, Same Day, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

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(907) 276-8222 srba@alaska.net

Year 5: November 2011 - October 2012

High
Low

183 caribou areas used by 54 respondents

National Petroleum Reserve Alaska

Table 17: Caribou Hunting Number of Trips, Nuiqsut, Years 1-5

	Year 1	Year 2	Year 3	Year 4	Year 5
20+	0%	0%	9%	7%	4%
6-20 trips	30%	28%	21%	28%	16%
4-5 trips	23%	21%	19%	15%	15%
2-3 trips	27%	26%	27%	29%	34%
1	20%	24%	24%	21%	32%
Total	100%	100%	100%	100%	100%
Number of Trips	121	174	212	193	211
Chi Square p = .001					

Stephen R. Braund & Associates, 2014.

The frequency of trips to a certain use area depends on a variety of factors including distance of the use are from the community, availability of transportation or fuel, hunting success, and personal reasons. One respondent reported traveling along the Nigliq Channel to the ocean on a near-daily basis during the summer months and explained,

> *[I hunt along] Nigliq; I don't go along the coast, but I go to the ocean, and there was quite a few [caribou] along there. It's too shallow out there [in the coastal areas]. [I go] every day; about a hundred times. Get away from the hot weather and go to the ocean.* (SRB&A Nuiqsut Interview November 2012)

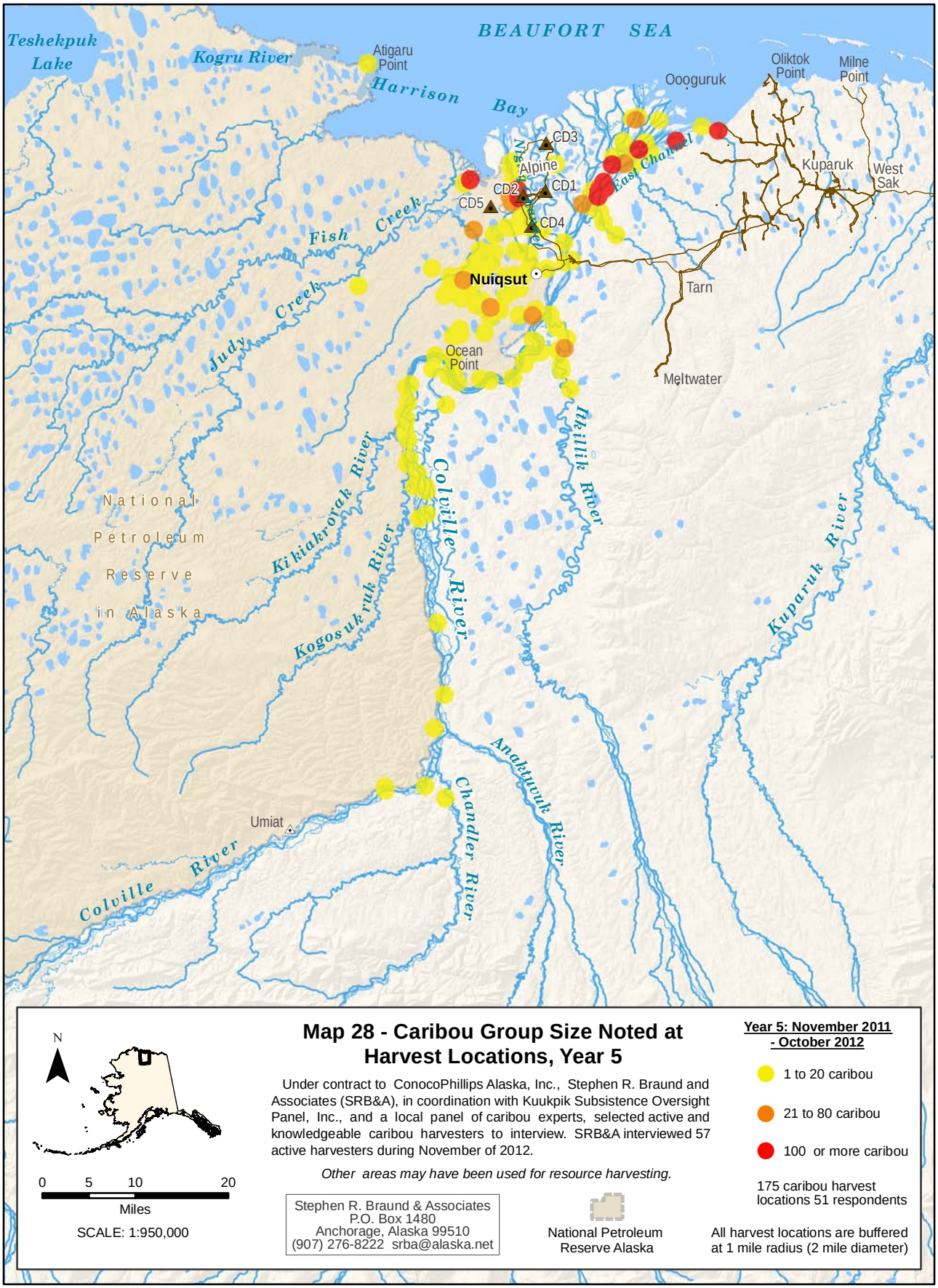
Two other respondents remarked that they, too, travel along the Nigliq Channel many times throughout the summer, remarking that they generally look for caribou on their way out to the ocean. These respondents noted,

> *Because there's like a huge hill where you can go and scout in that area. We did it quite a few times. We do it [go up Nigliq Channel] practically every day during the summer. More than 20 times.* (SRB&A Nuiqsut Interview November 2012)

> *[We hunt] a whole bunch at Nigliq; about 20 times through the summer. [We spend a] couple days in the ocean. We are out there in the ocean almost every day in July, and as we go out we are looking for caribou. But we hardly saw any [caribou] until mid-August.* (SRB&A Nuiqsut Interview November 2012)

Caribou Group Size

In response to a request from a member of the Nuiqsut Caribou Panel, in Year 5 the study team began asking respondents to estimate how many caribou were present for each harvest location they reported. Their grouped responses are provided in Table 18. In a majority of cases (131 of 177 harvest locations for which harvesters provided responses), residents reported harvesting caribou from groups of 10 or less. In four cases, respondents reported harvesting from herds that contained an approximate 1,000 to 2,000 caribou; however, only nine caribou were harvested in these instances. Map 28 depicts the group size noted at reported harvest locations, with 100 or more caribou depicted in red, between 21 and 80 caribou depicted in orange, and 1 to 20 caribou depicted in yellow. As shown on the map, larger herd sizes were more commonly reported when harvesting caribou along the East Channel. Some larger herd sizes were also reported at a location along the Nigliq Channel and near the mouth of Fish Creek. Elsewhere, such as west of the community toward Fish Creek and upriver towards Umiat, herds were reported to be smaller.



Map 28 - Caribou Group Size Noted at Harvest Locations, Year 5

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.

Other areas may have been used for resource harvesting.

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(907) 276-8222 srba@alaska.net

National Petroleum Reserve Alaska

Year 5: November 2011 - October 2012

- 1 to 20 caribou
- 21 to 80 caribou
- 100 or more caribou

175 caribou harvest locations 51 respondents

All harvest locations are buffered at 1 mile radius (2 mile diameter)

Table 18: Caribou Group Size Noted at Caribou Harvest Locations, Year 5

Group Size	# of Harvest Locations	# of Caribou Harvested
1000-2000	4	9
500-999	1	1
100-499	6	30
71-80	2	4
61-70	1	5
51-60	3	8
41-50	4	13
31-40	1	1
21-30	2	9
11-20	22	43
2-10	72	132
1	59	59
Unknown Group Size		37

Stephen R. Braund & Associates, 2014

Harvest Amounts (Household Harvest Surveys)

This section presents the results of the Year 5 household caribou harvest surveys alongside harvest data available from SRB&A, ADF&G and NSB harvest studies from previous years. Table 19 compares harvest information over time. The percentage of households using caribou has remained above 90 percent during every available study year since 1985 and was at the high end (99 percent) in 2012. The percentage of households attempting to harvest caribou has varied over time, with the percentage in Year 5 being in the mid-range of reported values (68 percent of households).The percentage of households reporting successful harvests in 2012 was also within the mid-range of values, at 62 percent, compared to the average of 67 percent. The percentage of households harvesting caribou in 2012 was slightly higher than in 2011 (62 percent versus 56 percent). In Year 5 there was a difference of six percentage points between households who attempted harvesting caribou and those who successfully harvested caribou.

The percentages of households giving caribou was lower than average (65 percent versus 75 percent), while the percentage receiving caribou was higher (79 percent compared to an average of 74 percent). The estimated harvest in Year 5 (501 caribou) was higher than the mean of all study years (456 caribou) by 10 percent, but lower than in Year 3 (2010; 562 caribou). The average pounds harvested in Year 5 (598) was somewhat higher than the average across all study years, as well as the average pounds per capita (147 pounds) compared to the mean of the fifteen observations between 1985 and 2012. Overall, recent harvest data show a decrease in the households hunting and successfully harvesting caribou, with overall harvest amounts being similar to or higher than past years. These data, in combination with the increase in households receiving caribou, suggest that certain households may be harvesting more caribou and sharing with households in need.

Table 19: Nuiqsut Caribou Harvests 1985-2011

Year	Percent Using	Percent Attempting to Harvest	Percent Harvesting	Percent Giving	Percent Receiving	Estimated Harvest	Estimated Pounds Harvested	Average Lbs Harvested per Household	Per Capita Lbs	Source
1985	98%	90%	90%	80%	60%	513	60,021	790	150	ADF&G 2011
1992		81%				278	32,551	310	78	Fuller and George 1999
1993	98%	74%	74%	79%	79%	672	82,169	903	228	Fall and Utermohle Unpublished
1994-95						258	30,186	364	73*	Brower and Hepa 1998; Braem et al. 2011
1995-96						362	42,354	455	99*	Bacon et al. 2009; Braem et al. 2011
1999-00						413			112	Pedersen and Taalak *Unpublished* as cited in Braem et al. 2011
2000-01						496	57,985	453	134*	Bacon et al. 2009; Braem et al. 2011
2002-03	95%	47%	45%	80%	49%	397	46,449	442	118	Braem et al. 2011
2003-04	97%	74%	70%	81%	81%	564	65,988	617	157	Braem et al. 2011
2004-05	99%	62%	61%	81%	96%	546	63,882	597	147	Braem et al. 2011
2005-06	100%	60%	59%	97%	96%	363	42,471	442	102	Braem et al. 2011
2006-07	97%	77%	74%	66%	69%	475	55,575	579	143	Braem et al. 2011
2010	94%	86%	76%			562	65,754	707	-**	SRB&A 2012
2011	92%	70%	56%	49%	58%	437	51,129	544	134	SRB&A 2013
2012	99%	68%	62%	65%	79%	501	58,617	598***	147	
Mean of observed values	97%	72%	67%	75%	74%	456	53,938	557	131	

Blank cells indicate data not available

*Per capita pound estimates for the 1994-95, 1995-96, and 2000-2001 study years were not originally published but were subsequently calculated by Braem et al. (2011) based on Alaska Department of Labor and Workforce Development (ADOLWD) population estimates for those years.

** Per capita data are not available for 2010, as household size was not collected during the household surveys that year.

***The estimates for Years 2010, 2011, and 2012 are based on averages that include one particularly high-harvesting household. In 2012, this household harvested nearly one quarter of all the reported harvests for the community. Therefore, the estimated harvests for 2010, 2011, and 2012 may be skewed upward due to the participation of this high-harvesting household in the harvest survey. Likewise, changes in community harvest estimates in future surveys could be due to this high-harvesting household not being interviewed.

Observations of Changes in Harvest Patterns

During the active harvester interviews, caribou harvester respondents were asked if any of the following hunting attributes had changed from the previous year: hunting area, frequency of trips, duration of trips, months of use, and harvest amounts. In each case where they answered that a change had occurred, harvester respondents were asked to describe the change and to state what they believed (or thought) caused the change. Table 20 summarizes the percent of respondents reporting a given type of change. The percentages of respondents reporting changes in hunting area, frequency, duration, and harvest amount in Year 5 are all within the range of variation for the previous four years of observation. There are no observed trends in these four variables. The percentage of households reporting a change in the amount harvested (54 percent) is lower than previous years (72 percent in Year 4, 68 percent in Year 3, 85 percent in Year 2 and 75 percent in Year 1). Respondents were also asked if they harvested enough caribou to meet their needs. Table 21 shows that 41 percent of respondents reported not harvesting enough caribou in Year 5 compared with 16, 21, 53, and 47 percent in Years 4, 3, 2, and 1 respectively. The data shown in Table 21 indicate an increase in the number of respondents who reported not harvesting enough caribou during the Year 5 study period, after a decrease during the previous two study years (Years 3 and 4).

Table 20: Percentage of Respondents Reporting Changes in Harvest Activities Compared to Previous Year, Years 1, 2, 3, 4and 5[3]

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Hunting Area Changed	31%	28%	39%	33%	36%
Frequency Changed	50%	77%	65%	60%	63%
Duration Changed	39%	32%	21%	21%	23%
Months Changed	19%	15%	12%	21%	21%
Harvest Amount Changed	75%	85%	68%	72%	54%

Stephen R. Braund & Associates, 2014.

Table 21: Percentage of Respondents Reporting Not Harvesting Enough Caribou, Years 1, 2, 3, 4 and 5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Reported Did Not Harvest Enough	47%	53%	21%	16%	41%

Stephen R. Braund & Associates, 2014.

Changes in Harvest Amount

During Year 5 interviews, 54 percent of Nuiqsut respondents reported a change in harvest amounts, slightly lower than in previous years (Table 20). The 54 percent of respondents reporting a change in harvest amounts is divided into 45 percent who reported harvesting less, which was close to the range of variation

[3] In the Year 1 and Year 2 reports, the percentage of respondents reporting changes in harvest activities was calculated based on the total number of respondents interviewed (including elders). In this report as well as the Year 3 report, the percentage of respondents is based on the total number of respondents who participated in the active harvester interview (not including elders who had not hunted during the previous year), as these questions were only asked of active harvesters. Thus, the percentages depicted for Years 1 and 2 are slightly different than those depicted in previous study year reports.

observed in previous years, and nine percent who reported harvesting more, which was lower than previous years (Table 22).

Table 22: Type of Change in Harvest Amount, Years 1-5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Harvest more	11%	15%	21%	17%	9%
Harvest less	64%	70%	47%	55%	45%

Stephen R. Braund & Associates, 2014.

Table 23 shows a cumulative list of reasons given for a decrease in harvest from the previous year. "Resource availability" has been one of the most common reasons given for a decrease in harvest amounts over the five study years, and was the most commonly given reason for a decrease in harvest amount for Year 5 (Table 23). Five respondents directly cited helicopter disturbance as the reason for the decrease and two respondents each mentioned one of the following reasons: change in subsistence providers[4], take fewer trips, air traffic, skittish behavior in species and farther from riversides/farther inland.

Table 23: Reasons for Decrease in Harvest Amount, Nuiqsut, Years 1-5

	Number of Observations				
	Year 1	Year	Year 3	Year 4	Year 5
Resource Availability	8	9	2	4	9
Helicopter Traffic Disturbance	4	0	0	2	5
Change in Subsistence Providers[1]	1	1	2	4	2
Take Fewer Trips	0	1	6	1	2
Air Traffic	1	0	0	0	2
Skittish Behavior in Species	0	0	1	0	2
Farther from Riversides/Farther Inland	0	2	4	0	2
Personal Reasons	0	3	3	7	1
I Do Not Know	0	2	1	5	1
Change in Distribution/Migration	0	1	0	3	1
Airplane Traffic Disturbance	2	1	0	1	1
Smaller Hunting Area	0	0	0	0	1
More Rain	0	0	0	0	1
Off Road Vehicles Disturbance	0	0	0	0	1
Oil Field Infrastructure	0	0	0	0	1
Migration Changed or Diverted	3	5	0	0	1
Later Migration/Arrival	0	0	0	0	1

[4] "Change in subsistence providers" refers to a change in the individual(s) who provides subsistence foods for the respondent or his/her household. For example, a respondent may harvest less caribou during a study year because his son took over more of the hunting duties and provided caribou to him (thus reducing the need to harvest as many caribou).

	Number of Observations				
	Year 1	Year	Year 3	Year 4	Year 5
Move to Different Areas	0	0	0	0	1
Lack of Transportation/Equipment	2	1	3	4	0
Employment/Lack of time	1	2	2	4	0
Change in Subsistence Dependents	3	2	0	2	0
Moved out of Area	0	0	3	1	0
Climate Affecting Travel	0	0	0	1	0
Sport Hunting and Fishing	0	0	0	1	0
Concern of Disease/Infection	0	0	0	1	0
Miscellaneous	0	0	0	1	0
Need Less	2	0	0	0	0
Reduced Harvest Opportunities	0	0	1	0	0
More Difficult	2	0	0	0	0
Worse Success	0	0	1	0	0
Travel Farther to Harvest Resource	1	0	0	0	0
Wind	0	0	1	0	0
Development	2	1	2	0	0
Oil Drilling	0	1	0	0	0
Pipeline	1	1	0	0	0
Contamination from Air Pollution	0	1	0	0	0
Sport Hunting Methods Disturbing	0	1	0	0	0
Predators	0	0	1	0	0
Resource in Smaller Groups	1	0	0	0	0
Increase in Predators	0	1	0	0	0
Further from Community	0	1	0	0	0
Earlier Migration/Arrival	0	0	1	0	0
Change in Food Availability	0	2	0	0	0

[1]Change in subsistence providers refers to a respondent either losing a primary subsistence provider, or gaining a subsistence provider (e.g., an individual harvested fewer caribou because his son became the primary hunter). See Appendix E for descriptions of all codes.

Stephen R. Braund & Associates, 2014.

Two respondents expressed the belief that the caribou had moved westward, with one respondent noting, "Can't find caribous, now they [are] all in Wainwright." Another respondent described, "Seems like it was less caribous all summer, because they were mostly like on the west side towards Point Lay and Wainwright. They have been there all summer from what I heard." Several respondents made more general comments about the lack of caribou in the area during Year 5, with one respondent noting, "They were pretty hard to find, [they] weren't around". Two other respondents provided similar observations, stating,

> *There was no caribou out there at all. There were no caribous where the Hondas would report along Colville, Nigliq, or Fish Creek, or Oliktok Point. Nothing in that area.* (SRB&A Nuiqsut Interview November 2012)

> *Most of the time I didn't hardly see any caribou this year. I didn't see any going towards Nigliq at all this year. They were further from the rivers.* (SRB&A Nuiqsut Interview November 2012)

In addition to the caribou being more difficult to find, one harvester discussed changes he had observed in the migration patterns of the caribou. This respondent observed,

> *That migration pattern has gone southward. We hardly see the western herd this year. The Porcupine Herd, haven't seen them lately. We used to see thousands of Porcupine Herd coming through the villages, but we haven't seen those for a number of years and since that pipeline was built, that changed the pattern of the migration of the caribou. [We are] mostly harvesting caribou from Western or Central Herd.* (SRB&A Nuiqsut Interview November 2012)

One respondent described a change in the behavior of the animals, stating that they have become increasingly more sensitive to human contact compared to previous years:

> *I guess the caribou are more skittish nowadays. People are approaching them and they are gone. Before they used to just hang out and you could drive by them with the boat and they would just look at you. Now when they hear that outboard motor they are gone. They are more skittish nowadays. Maybe it is that aircraft activity. There is a lot of traffic out in that area.* (SRB&A Nuiqsut Interview November 2012)

Respondents who attributed air traffic (including helicopter traffic) as the reason for harvesting less often noted that increased air traffic results in a decrease in the number of animals within a given area. Several individuals described the impacts of air traffic on their caribou hunting success as follows:

> *[I caught] less [caribou compared to the previous year], same thing – [it was difficult to hunt] with the helicopters and low flying planes. And there's actually rolligons that go, when we go up and Puviksuk there's one really big hill and we could see a whole bunch of rolligon trails. There were hardly any [caribou] up there.* (SRB&A Nuiqsut Interview November 2012)

> *I think there was just too much helicopter activity. People were spotting them everywhere, hard to spot them [caribou] too much activity.* (SRB&A Nuiqsut Interview November 2012)

> *Well they hardly been coming, they been [staying on] one side of the village most of the time, because of the oil fields and choppers, and I hardly go.* (SRB&A Nuiqsut Interview November 2012)

A few individuals attributed their decreased harvests in Year 5 to personal reasons. Two residents indicated that they harvested less as a result of receiving caribou from other people, including family members. One respondent noted that "the nephew, he brings them over" when explaining why he had harvested fewer caribou, and another harvester described, "I just didn't go out and other people got them" as the reason for harvesting less. One respondent attributed the bad weather conditions as the reason for harvesting less caribou during the Year 5 study period, describing, "I didn't hardly go out this year. It was the weather too; it was raining and a lot of windy days."

As shown in Table 22, nine percent of Nuiqsut active harvester respondents reported harvesting more caribou in Year 5 compared to previous study years. The reasons given for an increased harvest were resource availability, change in subsistence dependents and a change in subsistence providers (Table 24). One respondent noted that they harvested more than the previous year, but did not provide a reason for the change.

Of the five respondents who described harvesting more caribou during the Year 5 study period, two respondents described an increase in the number of caribou they encountered while out hunting. One individual described his harvest success as "chance," saying, "It [the caribou] was there. Last year when I went out I didn't run into some. It was like that this year also, but it's like, by chance" (SRB&A Nuiqsut

Interview November 2012). Another reported encountering more caribou altogether in Year 5, compared to the previous year. Other respondents noted that their increased harvest of caribou was due to the necessity of procuring more meat for their families, with one respondent stating, "I needed to provide my family with caribou" (SRB&A Nuiqsut Interview November 2012).

Table 24: Reasons Given for Increase in Harvest Amount, Nuiqsut, Years 1-4

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Resource Availability	0	2	2	4	2
Change in Subsistence Dependents	1	0	1	1	1
Change in Subsistence Providers	0	0	1	1	1
Personal Reasons	2	2	1	5	0
I Do Not Know	0	0	0	1	0
Need more	0	1	0	0	0
Better Transportation/Equipment	0	0	1	0	0
Take More Trips	1	3	2	0	0
Better Success	0	0	1	0	0
Migration Changed or Diverted	0	0	1	0	0
Closer to Community	1	0	0	0	0
Moved into Area	0	0	2	0	0

Stephen R. Braund & Associates, 2014.

Changes in Trip Frequency

As shown in Table 20, the percentages of harvester respondents reporting a change in trip frequencies has varied over the five study years from 50 percent (Year 1) to 77 percent (Year 2). In Year 5, 63 percent of respondents reported a change in the frequency of their hunting trips; 36 percent of respondents reported taking fewer trips, and 27 percent reported taking more trips (Table 25). Both numbers are within the range of those reported in prior study years. "Personal reasons" was the most frequently cited reason for an increase in the frequency of hunting trips in Year 5 (five observations), followed by "resource availability" (three observations) and "change in subsistence providers" (two observations) (Table 26). "Better transportation/equipment", "need more", "use area changed", "helicopter traffic disturbance", Airplane traffic disturbance", and "moved out of area" were each reported once as the reason for an increase in the number of hunting trips (Table 26).

Table 25: Type of Change in Trip Frequency, Nuiqsut, Years 1-5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Take More Trips	25%	36%	32%	26%	27%
Take Fewer Trips	25%	42%	33%	34%	36%

Stephen R. Braund & Associates, 2014

Table 26: Reasons for Increase in Trip Frequency, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Personal Reasons	0	6	7	7	5
Resource Availability	4	7	2	4	3
Change in Subsistence Providers	0	0	0	0	2
Better Transportation/Equipment	0	0	7	2	1
Need More	0	0	2	0	1
Use Area Changed	0	0	0	0	1
Helicopter Traffic Disturbance	0	0	0	0	1
Airplane Traffic Disturbance	0	0	0	0	1
Moved out of Area	0	0	1	0	1
Change in Subsistence Dependents	0	0	0	1	0
Weather	0	0	0	1	0
I Do not Know	0	1	0	1	0
Sharing More	1	0	0	0	0
Mitigation Funds	1	0	0	0	0
Competition with Sport Hunters	0	1	0	0	0
Traffic Disturbance	1	1	0	0	0
Development	2	1	0	0	0
Pipeline	1	0	0	0	0
Migration Changed or Diverted	2	0	0	0	0
Moved into area	0	0	1	0	0

Stephen R. Braund & Associates, 2014

Those respondents who reported hunting more for personal reasons generally indicated that they had more opportunities to hunt or hunted more for personal enjoyment. One respondent noted that he went hunting more "to get out of Nuiqsut," and another noted, "My buddies ask me and I never say no" (SRB&A Nuiqsut Interviews November 2012). Three respondents attributed their increase in trips to resource availability, noting that they had to expend more hunting effort because of the lack of caribou in the area. As one individual put it, "[I hunted more] because we never did see any animals" (SRB&A Nuiqsut Interview November 2012). Two individuals credited the change in trip frequency to a change in subsistence providers. One described the need to provide caribou to family members explaining, "Probably [went] double [the amount] because my Dad needs me to hunt more", while another remarked that he takes more trips because "his boy is old enough to go" (SRB&A Nuiqsut Interview November 2012). In addition to the more commonly reported reasons for taking more trips, one respondent commented that they went out more out of general necessity, stating, "We needed more food. More caribous, more ducks – whatever we could get" (SRB&A Nuiqsut Interview November 2012).

"Personal reasons" was the most common explanation by active harvesters for a decrease in trip frequency in Year 5 (Table 27). Specifics included being out of the community, unable to find childcare, and changes in hunting partners and availability. Other respondents indicated that they did not have as much time for subsistence activities due to employment, with one respondent describing, "I work six days a week, on my day off I go out" (SRB&A Nuiqsut Interview November 2012).

Table 27: Reasons for Decrease in Trip Frequency, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Personal Reasons	2	2	8	10	8
Employment/Lack of Time	3	3	5	7	4
Lack of Transportation	4	10	6	5	4
I Do Not Know	0	0	0	2	2
Change in Subsistence Providers	0	0	0	0	1
Increased Cost of Living/Expenses	0	0	0	0	1
Development	0	0	0	0	1
Oil Field Infrastructure	0	0	0	0	1
Change in Distribution/Migration	0	0	0	0	1
Moved into Area	0	0	0	1	0
Need Less	0	1	0	0	0
Less Snow	1	0	0	0	0
Moved out of Area	0	0	1	0	0

Stephen R. Braund & Associates, 2014

Four respondents hunted less often as a result of a lack of access to transportation or being unable to afford gas to fuel their equipment. One individual described,

> *The cost of fuel ...is outrageous. ...The price of a quart of oil going up is outrageous, so you are limited to your range now. As much as we used to travel without boundaries, and [now you have to consider] how far [your fuel] can take you and back to town.* (SRB&A Nuiqsut Interview November 2012)

In contrast, one respondent noted that he took fewer trips because of a change in subsistence providers, noting that his son now does the majority of the hunting. The respondent described the change saying,

> *My son doesn't give me a chance to go out. Man, he kept his mother so busy! He didn't give me a chance to go out! My son got the rest [of the caribou]. He comes back with three or four caribou on his four-wheeler, every time. I probably could've gotten more if I tried, but son's been bringing back a lot more so I don't know if he's covering for me since I can't go out so much because of my leg, or if he's pushing himself.* (SRB&A Nuiqsut Interview November 2012)

Changes in Trip Duration

The percentage of active harvesters reporting a change in their trip duration in Year 5 was within the range of what was reported in previous years, with 23 percent of harvester respondents reporting a change in Year 5 compared to 21 percent in Years 3 and 4, 33 percent in Year 2 and 39 percent in Year 1 (Table 20). Thirteen percent of Year 5 respondents reported taking longer trips than in previous years, and eleven percent reported taking shorter trips (Table 28). The percentage of respondents taking longer trips is lower than in Years 1 and 2, while the percentage of respondents taking shorter trips has varied less over the five study years.

"Resource availability" was the most commonly cited reason for taking longer trips in Year 5, similar to other study years (Table 29). The other reasons mentioned for taking longer trips during the Year 5 study period were "personal reasons," "Farther from riversides/farther inland," "travel farther to harvest

resource," "better transportation/equipment," and "change in transportation method," which were each reported once by a respondent.

Table 28: Type of Change in Trip Duration

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Take Longer Trips	33%	25%	9%	12%	13%
Take Shorter Trips	6%	8%	12%	9%	11%

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Table 29: Reasons for Taking Longer Trips, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Resource Availability	4	3	0	3	2
Personal Reasons	0	3	3	3	1
Farther from Riversides/Farther Inland	0	1	0	0	1
Travel Farther to Harvest Resource	1	1	1	1	1
Better Transportation/Equipment	0	0	0	0	1
Change in Transportation Method	0	0	0	0	1
Increased Cost of Living/Expenses	0	1	0	0	0
More Difficult	1	0	0	0	0
Worse Success	0	0	1	0	0
Helicopter Traffic Disturbance	2	0	0	0	0
Airplane Traffic Disturbance	2	0	0	0	0
Development	1	0	0	0	0
Migration Changed or Diverted	5	0	0	0	0

Stephen R. Braund & Associates, 2014.

The two respondents that reported "resource availability" as the reason for an increase in trip duration described their search for caribou with one respondent noting, "I had to look a little harder", and another saying "just looking out for caribous" when describing their longer trips. Similarly, one respondent described staying out longer when hunting for caribou, because he had to wait for the caribou to move closer to the riversides, saying,

> *[My trips are] longer, because you have to wait so long to get those herds to get closer to the river. It takes time to see whether they'll get closer to the river, where they gonna cross closer to your boat. We had to wait for this one for a while because it was heading straight towards Colville. Our boat was in a bank. One of them was running across. We got it in the river, [at] Helmerick's; we got it on shore.* (SRB&A Nuiqsut Interview November 2012)

One respondent described the necessity of traveling farther than previous years to access subsistence resources. He described,

> *Yeah, the average is 80-90 miles in a day. I would go all the way over here. Before, I would see something [caribou] and come home, but I had to go all the way across and I still wouldn't see anything [caribou]*. (SRB&A Nuiqsut Interview November 2012)

In contrast, another respondent explained that their reason for taking longer trips was due to personal enjoyment of the activity, stating "I just wanted to stay out there, really. I like it. I would rather be out there than in town" (SRB&A Nuiqsut Interview November 2012).

Eleven percent of Year 5 active harvesters reported taking shorter hunting trips during the Year 5 study period compared to the previous year (Table 28). Multiple reasons were provided for active harvesters for taking shorter trips during Year 5 including, "personal reasons," "resource availability," "employment/lack of time," "increased cost of living/expenses," and "more rain" (Table 30).

"Personal reasons" account for why four respondents took shorter trips during the Year 5 study period, with respondents specifically describing job and other obligations limiting their trip length. One respondent described several different reasons that resulted in decreased trip length, providing the following details:

> *The weather was pretty rainy most of the time, upriver anyways, lack of gas, and we didn't see any more by Anaktuvuk; that's the last time we seen them. We could hear the choppers when we were sleeping overnight, flying around.* (SRB&A Nuiqsut Interview November 2012)

Table 30: Reasons for Taking Shorter Trips, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Personal Reasons	1	0	5	2	4
Resource Availability	0	0	1	1	2
Employment/Lack of Time	1	1	0	1	1
Increased Cost of Living/Expenses	0	0	0	0	1
More Rain	0	0	0	0	1
Lack of Transportation/Equipment	0	1	1	1	0
I Do Not Know	0	0	0	1	0

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Changes in Use Area

As shown in Table 20, 36 percent of harvester respondents reported that their hunting area had changed in Year 5 compared to the previous year, similar to the previous study years. Twenty-nine percent of Nuiqsut caribou harvester respondents reported a general change in use area in Year 5, four percent reported that, compared to the previous year, they used a smaller hunting area, and four percent reported expanding their use area (Table 31).

Table 32 shows the reasons given for the more general observation of "use area changed." "Personal reasons" were cited by six respondents as the reason for their reported change in use area, while four cited "resource availability," and three cited "lack of transportation/equipment" and/or "change in distribution/migration." "Change in transportation method," "smaller hunting area," "climate," "warmer temperatures," and "farther from shore" were each mentioned once as reasons for respondents' use area change.

Table 31: Type of Change in Use Area, Nuiqsut, Years 1-5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Use Area Changed[1]	6%	19%	14%	29%	29%
Smaller Hunting Area	11%	0%	11%	0%	4%
Expanded Use Area	0%	0%	7%	0%	4%
Travel Farther to Harvest Resource	14%	4%	5%	2%	0%
Change in Harvest Methods	0%	0%	0%	2%	0%
Personal Reasons	0%	2%	0%	0%	0%
Take Fewer Trips	0%	2%	0%	0%	0%
Change in Timing of the Hunt	0%	2%	0%	0%	0%
Utilizing New or Different Areas	0%	0%	2%	0%	0%
Move to Different Areas	0%	2%	0%	0%	0%

[1] Refers to a respondent not hunting in their usual areas. See Appendix E for additional description of codes.

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Table 32: Reasons Given for a Change in Use Area, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Personal Reasons	0	1	5	11	6
Resource Availability	1	1	0	1	4
Lack of Transportation/Equipment	0	0	1	4	3
Change in Distribution/Migration	0	1	0	1	3
Change in Transportation Method	0	0	0	0	1
Smaller Hunting Area	0	0	0	0	1
Climate	0	0	0	0	1
Warmer Temperatures	0	0	0	0	1
Farther from Shore	0	0	0	0	1
Shallower Rivers/Lakes	0	0	1	3	0
Development	1	0	0	1	0
Better Transportation/Equipment	0	0	1	0	0
Employment/Lack of Time	0	1	0	0	0
Increased Cost of Living/Expenses	0	1	0	0	0
Climate Affecting Travel	0	2	0	0	0
Wind	0	1	0	0	0
Airplane Traffic Disturbance	1	0	0	0	0
Migration Changed or Diverted	1	2	0	0	0
Move to Different Areas	0	1	0	0	0

Stephen R. Braund & Associates, 2014.

The six responses coded under the "personal reasons" category included four who did not go to one or more of their usual areas (no particular reason) and two who changed their subsistence resource focus. The following quotes are from respondents who reported different use areas due to personal reasons:

> *Just didn't have the chance to go upriver; there's no reason, we just [had] no chance. Wherever we went this summer was where everybody said the caribous were. Like in July that's when they're all going up north, to get away from the bugs.* (SRB&A Nuiqsut Interview November 2012)

> *[This year] I didn't feel like it, didn't have a ride. [NAME]'s snowmachine's been breaking down.* (SRB&A Nuiqsut Interview November 2012)

> *Because sometimes, sometimes, we always wait for them [caribou] to come down this river [Colville], or this one…I went up to Chandler, just one time looking for moose. I saw some alright but I didn't shoot em', it was just a moose trip. We'd already got some [caribou].* (SRB&A Nuiqsut Interview November 2012)

> *I usually go in the Nigliq Channel when I put nets out [and hunt caribou at the same time], but I didn't put nets out.* (SRB&A Nuiqsut Interview November 2012)

Four respondents explained that they changed their use area due to "resource availability," describing,

> *This year [there were] no reports [of herds going to insect relief areas]. I never heard anybody mention a good sized caribou herd on the west side of us. By hearing on the VHF [they were] on the Colville side. Some on the* Nigliq *side, but mostly on the Colville side.* (SRB&A Nuiqsut Interview November 2012)

> *Yeah, it just seems like at times when you go out there's nothing, and all of the sudden they appear. On this side, east channel [that was a new area], yeah – because most of the time we would get them right here [at] Nigliq, not east. We'd always get reports from other boats [that] there's nothing.* (SRB&A Nuiqsut Interview November 2012)

"Lack of transportation/equipment" was a reason given by three respondents for changing their use area during the Year 5 study period. Two of those respondents noted that they did not hunt in their usual areas due to difficulties with their boats, saying,

> *We got late getting our motor, and that is why we didn't get to run around as much [or get to Fish Creek].* (SRB&A Nuiqsut Interview November 2012)

> *I usually go to Fish Creek [but we were always] low on gas, no boat, break down or whatever.* (SRB&A Nuiqsut Interview November 2012)

Three respondents also cited "change in distribution/migration" as the reason for their change in use areas. One respondent attributed the Meltwater road for diverting the caribou, saying,

> *Actually, with the Meltwater road on there, the caribou are getting lost. They don't' know where the migration route is. We've got the Prudhoe roads over there, but the Meltwater comes farther down, and in the caribou's mind, where's the direction? We used to have the caribou coming into town, the migratory route [used to] come in, but now they don't do that anymore.* (SRB&A Nuiqsut Interview November 2012)

In contrast, one respondent noted that their hunting area had changed and that they are now using a smaller harvest area than in previous years. This harvester attributed this change to a shift in the location of the caribou in relation to the waterways, describing,

> *To me they seemed a lot closer than last year [Year 4], because I didn't have to go very far. Even earlier this spring, we've had a couple young caribou run through this village, just doing their thing. To me they seem a lot closer. I wasn't gone for more than four or five hours to get one. Even [my] son hasn't gone out that far. He's usually gone a whole day, but he even came back twice in one day.* (SRB&A Nuiqsut Interview November 2012)

Another individual explained that the hot weather affected his hunting area in Year 5, saying "It was different, because I usually go up river to catch my caribou, [and] this time I went down[river] because it was hot and I went downriver" (SRB&A Nuiqsut Interview November 2012).

Changes in Hunting Months

Twenty-two percent of Nuiqsut caribou harvester respondents reported a change in their hunting months in Year 5, compared to 21 percent in Year 4, 12 percent in Year 3, 15 percent in Year 2 and 19 percent in Year 1 (Table 20). The percentage of respondents reporting changes in their hunting months was slightly higher than previous study years with Year 5 being the only year that some respondents (two percent) reported an earlier hunting season. Citing a general change in harvest season (Table 33), respondents most commonly cited "lack of transportation/equipment" for the change (six observations), followed by "personal reasons," "better transportation/equipment," "climate," "harsh winter," and resource availability" (with one observation each) (Table 34).

Table 33: Type of Change in Months of Harvest by Type of Change, Nuiqsut, Year1, 2, 3, 4 and 5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Later Hunting Season	11%	0%	5%	0%	0%
Earlier Hunting Season	0%	0%	0%	0%	2%
Harvest Season Changed	9%	15%	7%	21%	20%

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Table 34: Reasons Given for a Change in Harvest Season, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Lack of Transportation/Equipment	0	2	0	3	6
Personal Reasons	0	2	0	7	1
Better Transportation/Equipment	0	0	2	0	1
Climate	0	0	0	0	1
Harsh Winter	0	0	0	0	1
Resource Availability	0	2	1	0	1
Employment/Lack of Time	0	0	0	2	0
Change in Distribution/Migration	0	0	0	1	0
I Do Not Know	0	0	0	1	0
Change in Subsistence Dependents	0	1	0	0	0
Airplane Traffic Disturbance	0	1	0	0	0
Moved out of Area	0	0	1	0	0

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Of the six respondent who cited "lack of transportation/equipment" as the reason for their change in harvest season, lack of snowmachines (resulting in no winter hunting) was the most commonly reported cause, with respondents describing,

> *I recently sold my snowmachine. I still have to pay for my new snowmachine. I usually go winter [hunting] when I have a snowmachine.* (SRB&A Nuiqsut Interview November 2012)

> *I [usually] do wintertime hunting, but my snowmachine is not working, and I'm kind of having to work on them right now.* (SRB&A Nuiqsut Interview November 2012)

Two respondents cited weather conditions for the change in their hunting months. One individual indicated it was "too cold to go out winter hunting," while another respondent indicated the weather was responsible for the change in hunting months, saying, "usually [it] always freezes up first week of October; this time it was a little late" (SRB&A Nuiqsut Interview November 2012). One individual commented that the caribou used to be more available throughout the year close to town, rather than only during the summer months:

> *Usually they migrate just out here but they don't migrate like that anymore. I travel farther. Usually we kill them right near town; they used to come right through the village [but] not anymore – just in the summer.* (SRB&A Nuiqsut Interview November 2012)

Harvested Enough Caribou

Forty-one percent of Nuiqsut respondents indicated that they did not harvest enough caribou during Year 5, an increase from Year 4 (16 percent) and Year 3 (21 percent) (Table 21). A larger variety of reasons were reported for the increase in respondents reporting not harvesting enough caribou compared to previous years. The data show an increase in the number of harvesters not harvesting enough caribou despite the fact that the number of caribou harvested per capita are within the range of previous study years. A possible explanation for this is that while the community is harvesting similar overall numbers of caribou, a larger portion of these caribou may be harvested by a smaller number of hunters who share with multiple households.

Respondents cited a variety of reasons for not harvesting enough caribou during the Year 5 study period with the most commonly cited reasons being, "needed more" (13 percent of respondents), "personal reasons" (13 percent), "lack of transportation/equipment" (7 percent), "helicopter traffic disturbance" (7 percent), and "resource availability" (5 percent) (Table 35). The respondents below described their reasons for not harvesting enough caribou during Year 5:

> *Not really [enough caribou], but we get a lot of it given to her [and] my mother-in-law. I didn't get a caribou [this year or last year] and last year I went for the moose, so it's still zero. Mainly she gets her meat given to her [and our household] most of the time.* (SRB&A Nuiqsut Interview November 2012)

> *Didn't get enough, no. I had to let my brother get out and get some by snowmachine. So he had to share some of his. I told him I was short on caribou and my snowmachine is broke down and I'm short on caribou.* (SRB&A Nuiqsut Interview November 2012)

> *No, we didn't get enough. I don't know [why]. Maybe traffic – chopper traffic, and ah, maybe lack of gas or something – transportation, and I'm going fishing with my four-wheeler, I got no snowmachine; trying to fix it, anyways.* (SRB&A Nuiqsut Interview November 2012)

> *No, I would say we didn't [harvest enough caribou this year]. We went out a lot but they [the caribou] were mostly inland and you couldn't really catch them because they were too far.* (SRB&A Nuiqsut Interview November 2012)

> *Barely [enough caribou]. We could use more, definitely. We had to get one from [NAME] because we ran out and it's caribou soup every day.* (SRB&A Nuiqsut Interview November 2012)

Table 35: Reasons for Not Harvesting Enough Caribou, Nuiqsut, Years 1-5

	Percentage of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Needed More	0%	0%	0%	2%	13%
Personal Reasons	0%	2%	0%	2%	13%
Lack of Transportation/Equipment	6%	0%	0%	2%	7%
Helicopter Traffic Disturbance	6%	0%	0%	0%	7%
Resource Availability	19%	23%	0%	2%	5%
Change in Subsistence Providers	0%	0%	0%	2%	2%
I Do Not Know	0%	0%	0%	2%	2%
Use More	0%	0%	0%	0%	2%
Sharing More	0%	2%	2%	0%	2%
Shallower Rivers/Lakes	0%	0%	0%	0%	2%
River Channel Changed	0%	0%	0%	0%	2%
Overharvesting of Species	0%	0%	0%	0%	2%
Predators	0%	0%	0%	0%	2%
Later Migration/Arrival	0%	0%	0%	0%	2%
Farther from Riversides/Farther Inland	0%	0%	0%	0%	2%
Change in Subsistence Dependents	8%	2%	0%	2%	0%
Employment/Lack of Time	0%	4%	0%	2%	0%
Harvest Less	0%	0%	12%	0%	0%
Increased Cost of Living/Expenses	0%	2%	0%	0%	0%
Traffic Disturbance	0%	2%	0%	0%	0%
Airplane Traffic Disturbance	3%	0%	0%	0%	0%
Air Traffic	3%	0%	0%	0%	0%
Development	6%	0%	0%	0%	0%
Migration Changed or Diverted	14%	4%	0%	0%	0%

Stephen R. Braund & Associates, 2014.

Observations of Harvested Caribou Health and Condition

The percent of respondents reporting one or more "abnormalities", which had been declining in the first four study years, increased in the Year 5 study period. Forty-five percent of Year 5 respondents reported one or more abnormalities in harvested caribou compared to 29 percent in Year 4, 40 percent in Year 3, 38 percent in Year 2 and 64 percent in Year 1 (Table 36).

Table 36: Respondent Observations of Abnormalities in Harvested Caribou, Nuiqsut, Years 1-5[5]

	Percent of Respondents				
	Year 1	Year 2	Year 3	Year 4	Year 5
Health	47%	26%	18%	26%	34%
Other	3%	4%	0%	0%	4%
Parasites	22%	4%	5%	3%	4%
Quality	8%	4%	4%	10%	14%
Size	31%	13%	18%	14%	27%
Respondents Observing at Least One Abnormality in Caribou	64%	38%	40%	29%	45%

Stephen R. Braund & Associates, 2014.

The two principle descriptors used to describe observed abnormalities during all study years are "health" (58 percent of abnormal caribou) and "size" (66 percent of abnormal caribou) (Table 37). In addition, in Year 5 22 percent of reported abnormal caribou had changes related to quality. The overall numbers of caribou harvested that were characterized as "abnormal" were similar in Years 2 through 4, and elevated in Year 5. Year 1 had a particularly high number of caribou reported as skinny or with abnormal numbers of parasites, which resulted in higher overall numbers reported that year.

For all types of abnormalities, respondents reported using 25 of the 50 caribou with reported abnormalities in Year 5, or 50 percent, within the range of used abnormal caribou in previous study years (Table 37). They used 11 of 27 in Year 4 (41 percent), 25 of 37 in Year 3 (68 percent), 20 of 34 in Year 2 (59 percent), and 47 of 70 in Year 1 (67 percent). In a few cases in Year 5, residents reported cutting off and discarding the infected areas of meat and using the remainder of the uncontaminated meat. In addition to the active harvester interviews, the Year 5 household harvest surveys also included questions about sick or injured caribou. As shown in Table 38, 23 percent of Nuiqsut households reported harvesting sick caribou in 2012, accounting for at least 9 percent of all caribou harvested. In most cases (85 percent of sick caribou), households did not use these caribou. A slightly smaller percentage of households reported harvesting sick caribou in 2011, at 18 percent; in addition, a smaller percentage of Year 4 harvested caribou were reported as sick (26 caribou, or seven percent) compared to Year 5.

Unlike previous years, "disease/infection" was not the most commonly reported observation of abnormal caribou during the Year 5 active harvester interviews, with 29 observations (Table 39). Instead, "decrease in resource size", which in all previous years has been the second most commonly reported observations, became the most frequently reported in Year 5, with 33 observations reported by active harvesters. A number of respondents described harvesting caribou that were abnormally small or skinny. In general, respondents did not know why the caribou appeared to be smaller, with one respondent saying, "I don't know, maybe just from lack of food or from traveling," which another commented, "I don't know why they were skinnier, only God knows" (SRB&A Nuiqsut Interview November 2012) (Table 40). Others cited a change in feeding, contamination, or natural causes for the instances of skinny caribou. Respondents described the state of the caribou as follows,

> *No, these caribous we got were healthy. They were edible, but less fat for all of them. I haven't seen any that either of us [harvested] ...that had good-sized fat on them.* (SRB&A Nuiqsut Interview November 2012)
>
> *Less fat than they used to have. They were all… they had, one had only fat on him. They used to have big fat but most have small fat. The only one with big fat was from the Itkillik River.* (SRB&A Nuiqsut Interview November 2012)

[5] These observations likely include instances of Brucellosis, a common disease in the Teshekpuk and Central Arctic Herd that is characterized by pus-filled swellings and swollen joints.

Table 37: Number and Percent of Abnormal Caribou by Type of Abnormality, Nuiqsut, Years 1-5

	Number (%) of Abnormal Caribou					Number (%) of Abnormal Caribou Used				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Health	25 (36%)	16 (47%)	15 (41%)	23 (85%)	29 (58%)	4 (16%)	4 (25%)	2 (13%)	10 (44%)	6 (21%)
Other	1 (1%)	2 (6%)	0 (0%)	0 (0%)	2 (4%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	0 (0%)
Parasites	13 (19%)	5 (15%)	8 (22%)	3 (11%)	2 (4%)	11 (85%)	5 (100%)	7 (88%)	0 (0%)	0 (0%)
Quality	3 (4%)	2 (6%)	2 (5%)	6 (22%)	11 (22%)	2 (67%)	1 (50%)	2 (100%)	1 (17%)	1 (9%)
Size	42 (60%)	9 (26%)	17 (46%)	12 (44%)	33 (66%)	39 (93%)	8 (89%)	15 (18%)	1 (8%)	20 (61%)
Total	70 (100%)	34 (100%)	37 (100%)	27 (100%)	50 (100%)	47 (67%)	20 (59%)	25 (68%)	11 (41%)	25 (50%)

Stephen R. Braund & Associates, 2014.

Table 38: Household Harvest Survey Observations of Sick Caribou, 2011 and 2012

Study Year	% of HH Reporting Sick/Injured Caribou	Number (%) of Sick/Injured Caribou*	Number (%) of Sick/Injured Caribou Used by HH
2011 (Year 4)	18%	26 (7%)	5 (19%)
2012 (Year 5)	23%	40 (9%)	6 (15%)

Stephen R. Braund & Associates, 2014.

Table 39: Types of Observed Abnormalities, Nuiqsut, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Decrease in Resource Size	10	7	10	12	33
Disease/Infection	22	11	13	20	29
Change in Texture of Meat	0	3	0	4	8
Change in Smell of Meat	2	1	0	5	6
Resource Appears Unhealthy	0	0	0	0	1
Physical Abnormalities	0	3	0	0	1
Taste	1	0	0	0	1
More Parasites	3	1	1	3	1
Increase in Resource Size	1	0	4	0	0
Change in Resource Quality	0	0	2	0	0
Fewer Parasites	5	0	2	0	0
New Species in Region	0	1	0	0	0
Abnormal Resource Death	1	0	0	0	0
Parasites	0	1	0	0	0

Stephen R. Braund & Associates, 2014

Table 40: Perceived Reasons for Decrease in Resource Size, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
I Do Not Know	3	2	6	8	13
Change in Feeding	1	0	0	1	4
Natural Causes	0	2	1	0	4
Contamination	2	0	0	0	3
Change in Food Availability	0	0	0	1	1
Development	1	0	0	0	1
Parasites	0	0	0	0	1
Human Waste/Pollution	0	0	0	1	0
Concern of Contaminants	0	0	0	1	0

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
Predators	0	0	0	1	0
Miscellaneous	0	0	0	1	0
Warmer Temperatures	1	0	1	0	0
More Snow	1	0	0	0	0
Airplane Traffic Disturbance	0	1	0	0	0
Air Traffic	0	0	1	0	0
Contamination from Air Pollution	1	0	1	0	0
Declining/Damaged Habitat	1	0	0	0	0
Resource in Smaller Groups	0	1	0	0	0
More Parasites	0	0	1	0	0

Stephen R. Braund & Associates, 2014.

Several respondents described harvesting caribou with green-colored or pus-filled meat or organs, which was often described in animals that were also reported to be abnormally skinny by harvesters. Respondents noted,

> *That one, it had on the left side – it was light yellow with, like, jelly – some kind of jelly bubbles on the inside. On the other side it had dark yellow and the liver was gray. That one was skinny.* (SRB&A Nuiqsut Interview November 2012)

> *[The caribou had] pus on their rib cages, mold behind their knee. I grabbed my knife and it peeled right off of them. [The mold was] on their skin. Well, they kind of looked skinny to me.* (SRB&A Nuiqsut Interview November 2012)

> *It was all full of green pus and everything. As soon as he cut part of the skin it was all yellow and green; we didn't even know if it was safe to touch. Don't know [why]. It was all alone, too... It was kind of skinny but no flies or nothing - just a different color, the meat and the slime and everything, so we didn't cut it very far; we just closed it up and left it.* (SRB&A Nuiqsut Interview November 2012)

> *Two joints were green, the tongue was slimy, on all of them. That's not normal to me, so I just left them there, cut the head off. They were just greenish, discolored, and yellowish together. They were skinny; you could really see the ribs, barely any meat on the hindquarters. And it smelled, too. I mean, you could really smell the difference between a sick one and a normal one. They usually have those – what you call those. They're [warbles] you see them in summer time, and then they're gone in August.* (SRB&A Nuiqsut Interview November 2012)

Several other respondents commented on the same type of green or discolored meat, but noted that the caribou looked healthy until they cut into it. The respondents described,

> *There was one more caribou that I left out of this five. I got six and took five. They've been lately having green pus on them, green yellow pus on its joints right under here [points to armpit].* (SRB&A Nuiqsut Interview November 2012)

> *They couldn't cross the river; we selected a caribou out of them, and I thought this one might be the good one and it turned out to be a sick one. It had yellows in the lung area. It was a young male. That caribou we got, we thought it was going to be healthy, and it had the pus on the lung area. I don't know [why it was sick]. I thought it was healthier, the other two smaller ones got away.* (SRB&A Nuiqsut Interview November 2012)

One time we got one caribou and it was sick! When we skin it, it looks healthy when we look at it, and it looks healthy and we didn't know it was a sick caribou. [However, when] we sat it down... the meat was a greenish, bluish color – reddish color, kind of reddish color, and it was – from the outside, almost like medium size [caribou]. But it was sick caribou! But we just peel it from the outside and leave it. And keep the rest of the meat. We used some of it. (SRB&A Nuiqsut Interview November 2012)

I did [shoot] just one, but it was sick, looked like it was… Something was wrong with its legs. The meat looked funny, different ….And the veins, and the stomach...The meat looked greenish or brown, the meat looked brown…. It was a young bull, medium-sized bull. (SRB&A Nuiqsut Interview November 2012)

When asked to provide an explanation for disease/infection, residents commonly responded that they did not know the cause of the observed sickness (Table 41). However, six respondents thought that the disease/infection may have been the result of a previous injury sustained by the resource, and three believed that human waste or contamination was the cause.

Table 41: Perceived Reasons for Disease/Infection, Years 1-5

	Number of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5
I Do not Know	12	4	6	5	8
Resource Injury	1	3	2	0	6
Human Waste/Pollution	0	0	1	5	2
Contamination	0	1	0	2	1
Habituated to Development	0	0	0	1	0
Development	1	0	0	0	0
Oil Spill Contamination	1	0	1	0	0
Contamination from Air Pollution	4	2	3	0	0
Concern of Contaminants	1	0	0	0	0
Predators	0	1	0	0	0
Change in Feeding	1	0	0	0	0
Change in Food Availability	1	0	0	0	0

Stephen R. Braund & Associates, 2014

Observations regarding the causes of disease/infection in caribou include the following:

Maybe pollution? One time I was way up here, 50, 60 miles out, and I could smell ash, I could smell that flare-up, and when I looked up there was fine particles of ash. I think that's why the caribous are getting sick. They're eating it; they're feeding on the tundra. [There's] lots of vegetation during the summer that they feed on. (SRB&A Nuiqsut Interview November 2012)

We've got that Umiat, the erosion of the Umiat dump is floating through the river. That's a possibility, that the caribou might have been hanging out at that area. That's where the caribou's actually coming from. We've been finding containers, material containers along the river, you know? From the Umiat dump. The river actually eroded the ground and the dump is falling into the river. We left it [on the tundra]. (SRB&A Nuiqsut Interview November 2012)

I have no idea [why the caribou I caught was sick], [it had marks] on the back legs, it looked like it was stuck on a barricade or something. It had two worn out spots on the back of the legs, like it went into something and couldn't get out until later, and it had scars on its legs like it got stuck on a fence, sort of by the looks of it. But where's the fence? Where did you cross to get stuck like that? I left it; if anything

is wrong with a caribou, we don't take it. Never know what it's got. (SRB&A Nuiqsut Interview November 2012)

[There was a] wire around its neck [and] green patches. There was pus coming out of its eyes, [and the] antlers were all jacked up. It was really fat, not moving at all, [and] we were wondering, 'What the heck?' then when we got close we seen the sores over it; cuts from the wire. They passed by it [on the way back], and the body was already gone from a bear. (SRB&A Nuiqsut Interview November 2012)

I don't know why they do that. Maybe [the caribou was in] a fight or something, probably that's what I would think. (SRB&A Nuiqsut Interview November 2012)

Respondents in Year 5 provided multiple other observations of abnormal caribou including "change in texture of meat" (8 observations); "change in smell of meat" (6 observations); and "resource appears unhealthy," "physical abnormalities," "taste," and "more parasites" (each with one observation) (Table 39). Two respondents provided the following observations:

He had some dark yellow on his ankles and his liver had three white lines through it; it just stinked, it didn't even smell like caribou. It just stinked. Couldn't even tell you what it smelled like. Ever smelled the stomach before? Almost like that, only ten times worse. (SRB&A Nuiqsut Interview November 2012)

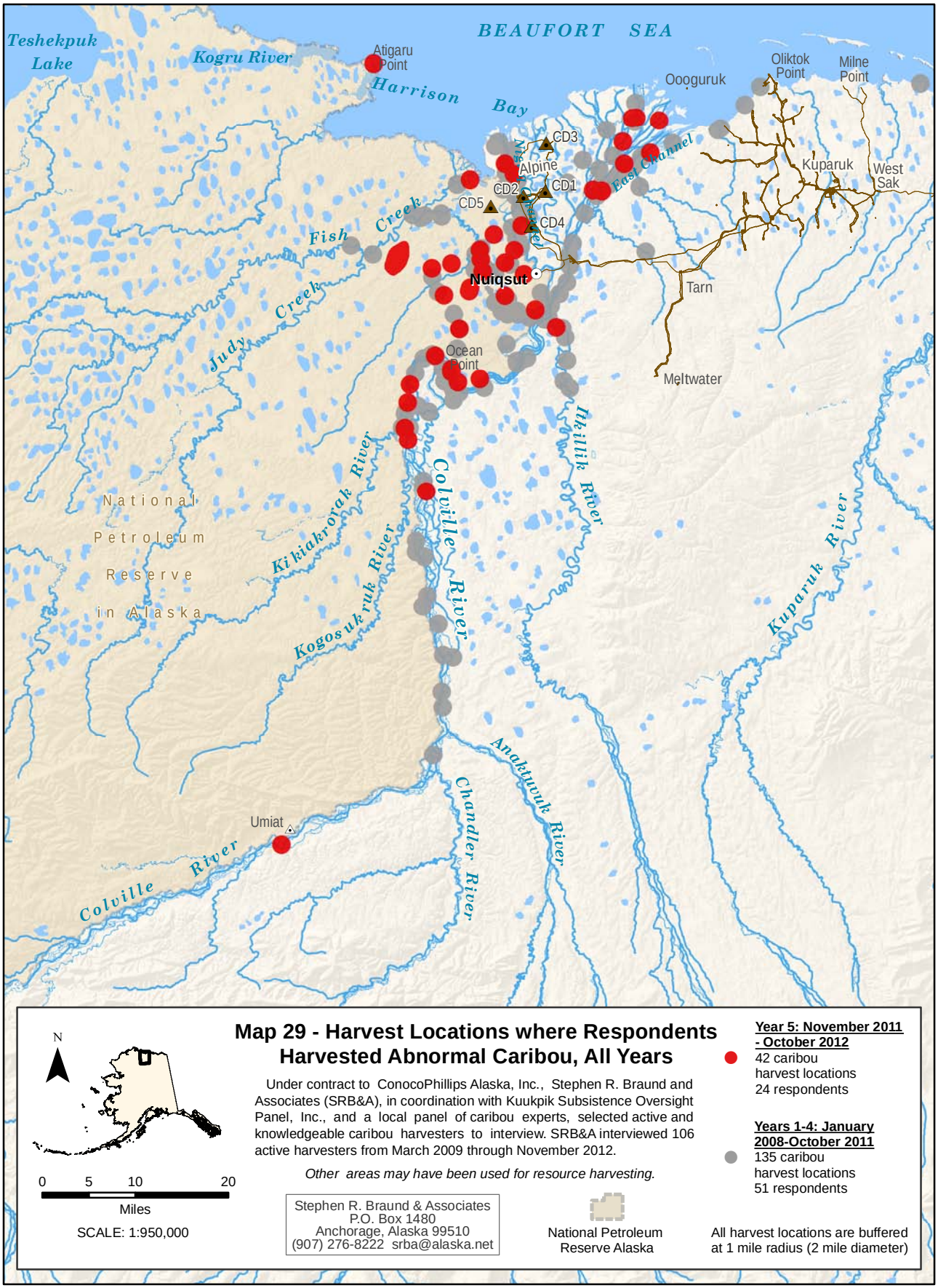
It was on the horn, like a big bubble, looked like a tumor to us but really we couldn't tell; it was a pretty big bull I was thinking it was a tumor or something, I just cut the head off and take the rest. It was just on the horn though. We used the body. (SRB&A Nuiqsut Interview November 2012)

The locations where Year 5 respondents reported harvesting caribou they perceived to be abnormal are depicted in red on Map 29, and locations identified during previous study years are shown in gray. For the Year 5 time period, respondents reported harvesting "abnormal" caribou primarily along the Colville River, including both Nigliq and the East Channel, and in an overland area to the west of the community toward Fish Creek. Other areas include the mouth of Itkillik River and at Atigaru Point. During all study years, the majority of "abnormal" caribou reported were harvested north of Ocean Point; however, this is generally the case for caribou harvests as a whole (Map 10). In Year 5, almost all "abnormal" caribou were harvested north of Sentinel Hill, with the exception of one location near Umiat.

Impacts on Harvesting Activities

Forty-eight percent of harvester respondents in Year 5 reported one or more perceived Alpine-related impacts on caribou hunting[6] (Table 42). This compares with 72 percent of respondents in Year 1, 64 percent of respondents in Year 2, 58 percent of respondents in Year 3, and 31 percent in Year 4. The higher percentage of study participants reporting impacts in 2008 (Year 1) is due in part to Year 1 respondents including impacts that had occurred since the Alpine development had begun. During Years 2 through 5, researchers tried to document only impacts that had occurred during the respective study time period. In addition, in this and the Year 4 report researchers reviewed all data to improve the focus on only impact reports that are Alpine-related. Hence, the data on reported impacts for Year 1 through 3 may differ from data reported in previous study year reports, as the previous study year reports include impacts that did not result directly from Alpine activities.

[6] The impacts discussed in this section are those that respondents believed were related to Alpine activities. It is not possible to verify the source of all impacts, and in some cases respondents were unsure of the source of an impact. During their review of this report, CPAI noted instances where Alpine-related impacts were reported in areas where CPAI did not conduct activities during the study period.



Map 29 - Harvest Locations where Respondents Harvested Abnormal Caribou, All Years

Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 106 active harvesters from March 2009 through November 2012.

Other areas may have been used for resource harvesting.

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Year 5: November 2011 - October 2012
42 caribou harvest locations
24 respondents

Years 1-4: January 2008-October 2011
135 caribou harvest locations
51 respondents

National Petroleum Reserve Alaska

All harvest locations are buffered at 1 mile radius (2 mile diameter)

Table 42: Respondent Report Alpine-Related Impacts on Caribou Hunting, Nuiqsut, Years 1-5

	Percent of Respondents					Percent of Observations				
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 1	Year 2	Year 3	Year 4	Year 5
Helicopter Traffic	61%	40%	47%	22%	30%	28%	26%	49%	54%	55%
Plane Traffic	42%	32%	16%	9%	9%	22%	21%	16%	18%	18%
Other Traffic	25%	19%	2%	3%	0%	10%	12%	2%	7%	0%
Oil Company Personnel	6%	2%	4%	0%	0%	2%	1%	4%	0%	0%
Man-made Structures	61%	32%	9%	5%	13%	30%	22%	9%	11%	18%
Regulations	14%	11%	0%	0%	2%	6%	7%	0%	0%	3%
Seismic Lines or Activity	0%	11%	18%	0%	0%	0%	7%	18%	0%	0%
Other	6%	6%	2%	5%	2%	4%	4%	2%	11%	5%
Any Impact	72%	64%	58%	31%	48%					
Number of Respondents/ Observations	36	53	57	58	57	87	82	55	28	38

Stephen R. Braund & Associates, 2014.

Although residents were asked to report specifically on Alpine related impacts, residents sometimes reported impacts not associated with Alpine, despite being cued to report Alpine-only impacts. Respondents in Year 5 put forth the question of whether or not impacts that were not specifically Alpine-related, but utilized Alpine resources should be included in the study (i.e. Repsol helicopters making use of Alpine heli-pads). However, according to CPAI, it is CPAI policy that non-Alpine operations do not make use of Alpine facilities except in the case of an emergency situation. Since this did not occur in 2012, non-Alpine impacts are not represented in Table 42. However, the presence of other activities on the North Slope is still relevant to understanding overall impacts on caribou harvesting activities and puts Alpine-related impacts into context, and therefore these "other" impacts are summarized below. The study team recorded all impacts reported by respondents and did not make determinations regarding what constituted an impact or not. In other words, if a respondent indicated that a development activity impacted their caribou hunting, then that activity was recorded as an impact and reported as an impact in this report. However, if a respondent stated that the development activity did not impact them or their hunting ("I saw some helicopters, but they did not bother me"), then it was not recorded as an impact or reported as an impact in this report.

As in the case of Years 1 through 4, the most commonly reported Alpine-related impact is associated with helicopter traffic, with 30 percent of harvester respondents reporting helicopter traffic impacts in Year 5. These observations account for 55 percent of all impact observations in Year 5 (Table 42). The percentage of respondents reporting helicopter-related Alpine impacts is within the range of what has been reported previous years. In Year 4, only 22 percent of respondents reported helicopter-related impacts, which may have been the result of improved communication between the community and Conoco during that study time as reported by the Nuiqsut Caribou Panel in a July, 2013 review meeting. The caribou panel reported that the improved communication was not maintained throughout the Year 5 study period[7].

The percentage of respondents reporting impacts from man-made structures in Year 5 (13 percent) was slightly higher than the previous two study years which had been showing a downward trend, from 61

[7] CPAI indicates that dissatisfaction with their communication protocol during the 2012 helicopter season was not communicated to them.

percent in Year 1, to 32 percent in Year 2, nine percent in Year 3 and five percent in Year 4. The reader should be aware that in Years 1 and 2, respondents were more likely to report indirect effects (i.e., caused by the action but later in time or father removed in distance) related to pipelines and infrastructure, such as changes in caribou migration and resource availability due to pipeline obstructions. The study team has made greater efforts to focus respondents on direct impacts (i.e., at the same time and place as the action) in recent study years. Therefore, while residents and Nuiqsut Caribou Panel members continue to express concerns about the impacts of pipelines and other infrastructure on caribou migration, they are less likely to report pipelines as direct impacts on their caribou hunting (i.e., impacts that occurred while they hunted) in recent years.

Reports of plane related impacts have declined from 42 percent of respondents in Year 1, to 32 percent in Year 2, 16 percent in Year 3, and nine percent in Years 4 and 5. No respondents reported impacts from "other traffic" in Year 5, continuing the downward trend observed in previous study years. There were also no reports of impacts from "oil company personnel" or "seismic lines or activity," in Year 5 (Table 42).

During the Year 5 household harvest surveys, the study team asked each household whether they had experienced impacts related to Alpine. As shown in Table 43, 32 percent of households reported experiencing Alpine-related impacts on their caribou hunting in 2012, 18 percent mentioned other (non-Alpine related) impacts, and four percent mentioned that they did not experience any Alpine impacts because they avoid the area altogether. Both Alpine-related impacts and other impacts were reported more frequently during the 2012 household surveys compared to 2011. As the question cued the respondents regarding Alpine-related impacts, it is likely that responses related to "other" (non-Alpine) impacts and "avoiding Alpine area" are under-represented.

Table 43: Household Observations of Impacts, 2012

Year	Percentage of Nuiqsut Households		
	Alpine-related Impacts	Other Impacts	Avoiding Alpine Area
2011	20%	9%	9%
2012	32%	18%	4%

Stephen R. Braund & Associates, 2014.

In general, the percentage of reported impacts was slightly higher in Year 5 compared to Year 4, however, the percentage of impacts reported has decreased in Year 4 and Year 5 compared to the first three study years. One potential factor affecting the decrease in reported impacts over time could be related to the study team's efforts to gather more specific data regarding the time and place of impacts. In earlier study years, residents were more likely to report indirect impacts (i.e., caused by the action but later in time or farther removed in distance) on their hunting activities and therefore were unable to provide specific information about the time and place of these indirect impacts (e.g., plane traffic disrupting the caribou in general, but no information about the types of planes or the locations where these impacts were occurring). After Year 1, the study team began prompting respondents to be more specific about the time and place of the impacts they reported ("Where were you when this impact occurred? Was there a specific time and place when this impacted your hunting?"). As the study has progressed over the five study years, respondents are more aware of the type of data the study team is trying to document and the result is that the study team is collecting more specific impact information, rather than the more general impacts that they have already reported in previous years. Residents have described and reported these more overarching concerns in previous years, and the study team has been more persistent in only addressing specific, "last year" impacts.

While some hunters believe that the general presence of oil development on the North Slope (including infrastructure and associated air traffic) affects the availability of caribou to local hunters, if a respondent did not report a "direct impact" related to the Alpine development (i.e., at the same time and place as their hunting activities), then their concerns are not represented in Table 42, but may appear in the "General Observations" discussion below. Because the study team does not ask respondents systematically to report whether Alpine affects their caribou hunting in general, but instead asks respondents about specific, direct impacts, these more general observations are not tallied in this report. Thus, the percentage of harvesters who believe that their caribou hunting activities are negatively impacted by the Alpine and Alpine Satellites developments, either directly or indirectly, is likely underrepresented in Table 42.

Another potential reason for the change in reported Alpine-related impacts is the increasing frequency of reported impacts from other developers and entities. The presence of multiple developers and researchers in respondents' hunting areas may result in increased difficulty distinguishing between the sources of, for example, helicopter and air traffic. Furthermore, over the four study years the study team has become more consistent in asking respondents to identify the source of reported impacts (i.e., which developer or entity caused the impact). The decreased reports of impacts over time could also reflect a trend of user avoidance, whereby respondents are not experiencing direct impacts related to Alpine because they are purposefully avoiding areas where they believe they may experience impacts.

Finally, decreased impacts over time with the exception of the slight incline in Year 5 could in fact reflect fewer impacts related to the Alpine development. In recent years, residents have indicated that improved communication with CPAI related to aircraft overflights have reduced conflicts with hunters. However, as mentioned above, Nuiqsut Caribou Panel members indicated a decline in communication between CPAI and the community of Nuiqsut during the Year 5 time period with an increase in helicopter traffic from various entities including the oil company Repsol[8].

Thus, while the data show a decline in reported Alpine impacts over time, it is unclear whether this decrease represents an actual decline in harvesters experiencing Alpine-related impacts; whether it signals that some local residents are adjusting to the increased activity in their hunting areas (and therefore no longer perceive this activity as an "impact" unless it directly disrupts their harvests); if it is a reflection of respondents' providing more detailed responses over time and experiencing new sources of impacts in their hunting areas; if it is a combination of all of the above; or if there are other factors that are affecting harvester perception of Alpine impacts. Future study years and adjustments to study protocols will help provide a better understanding of these trends.

Figure 7 shows the number of reported impacts on caribou hunting of all types by month for the five study years, and Figures 8 through 13 show individual impact reports by month for the five study years. The peak months for reported impacts in all five years are June, July, and August, the same months as peak caribou hunting activity (Figure 1). Reported impacts for Year 5 peak in July; this is consistent with the peak number of use areas reported in Year 5. Helicopter and airplane impacts account for most of all reported impacts and occur primarily from June through September (Figures 8 and 9). Reported impacts associated with seismic activities and oil company personnel were more likely to occur during the winter months (Figures 11 and 13).

[8] According to CPAI, the same communication protocol that had been implemented for the Year 4 time period was implemented again in Year 5. Panel members did not specify why they viewed the protocol to be less successful in year 5.

Figure 7: Reported Impacts by Month, Years 1-5

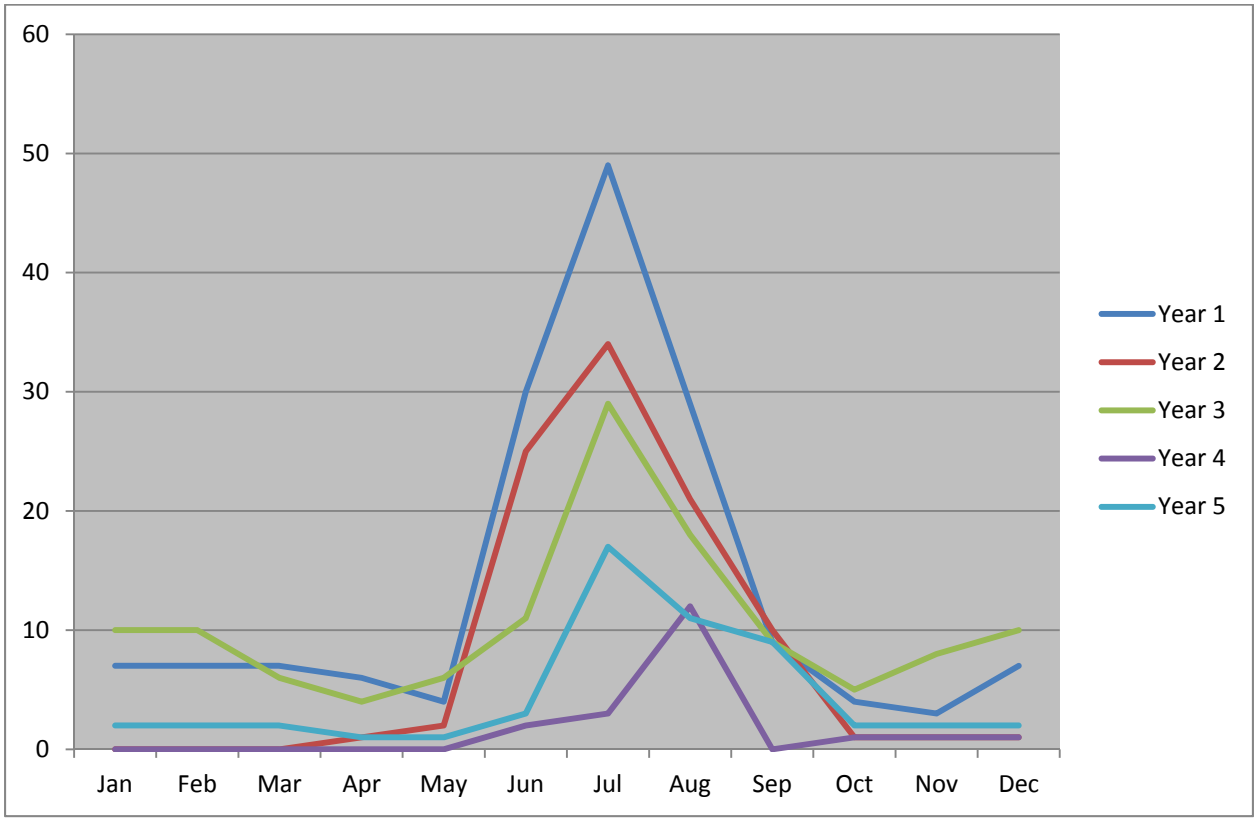


Figure 8: Reported Helicopter Impacts on Caribou Harvest Activities by Month: Years 1-5

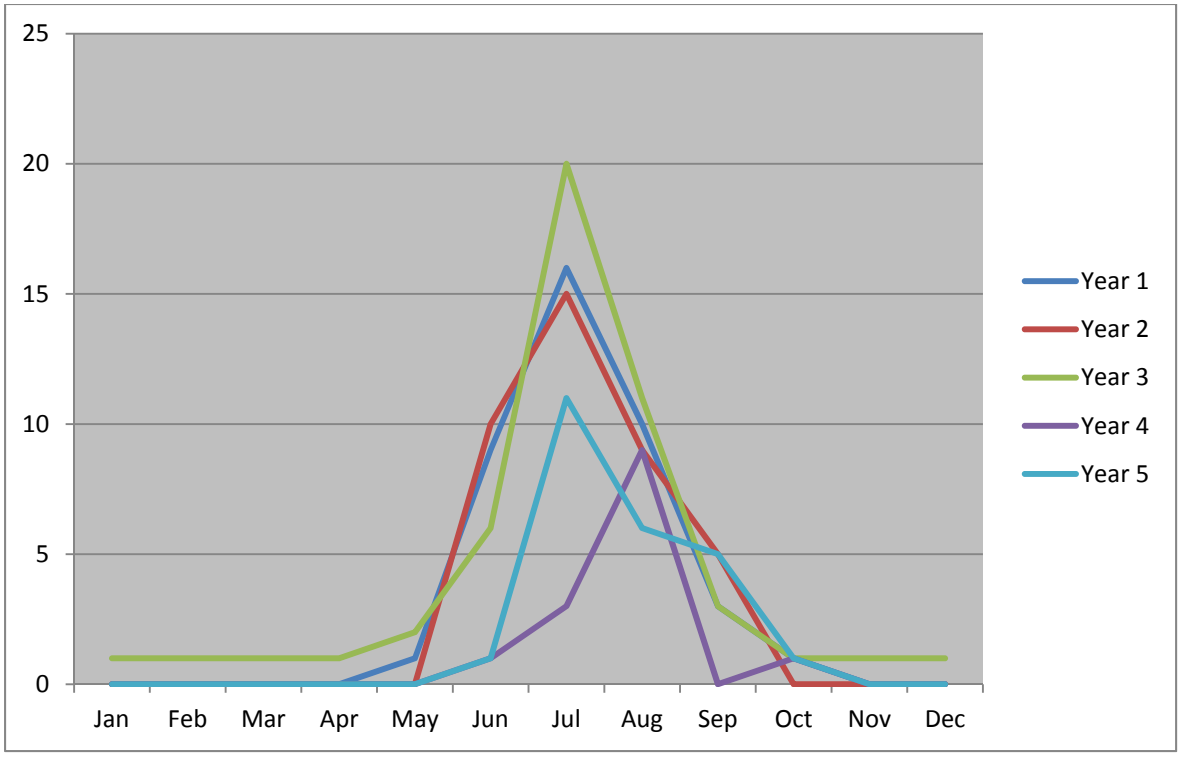


Figure 9: Reported Airplane Impacts on Caribou Harvest Activities by Month: Years 1-5

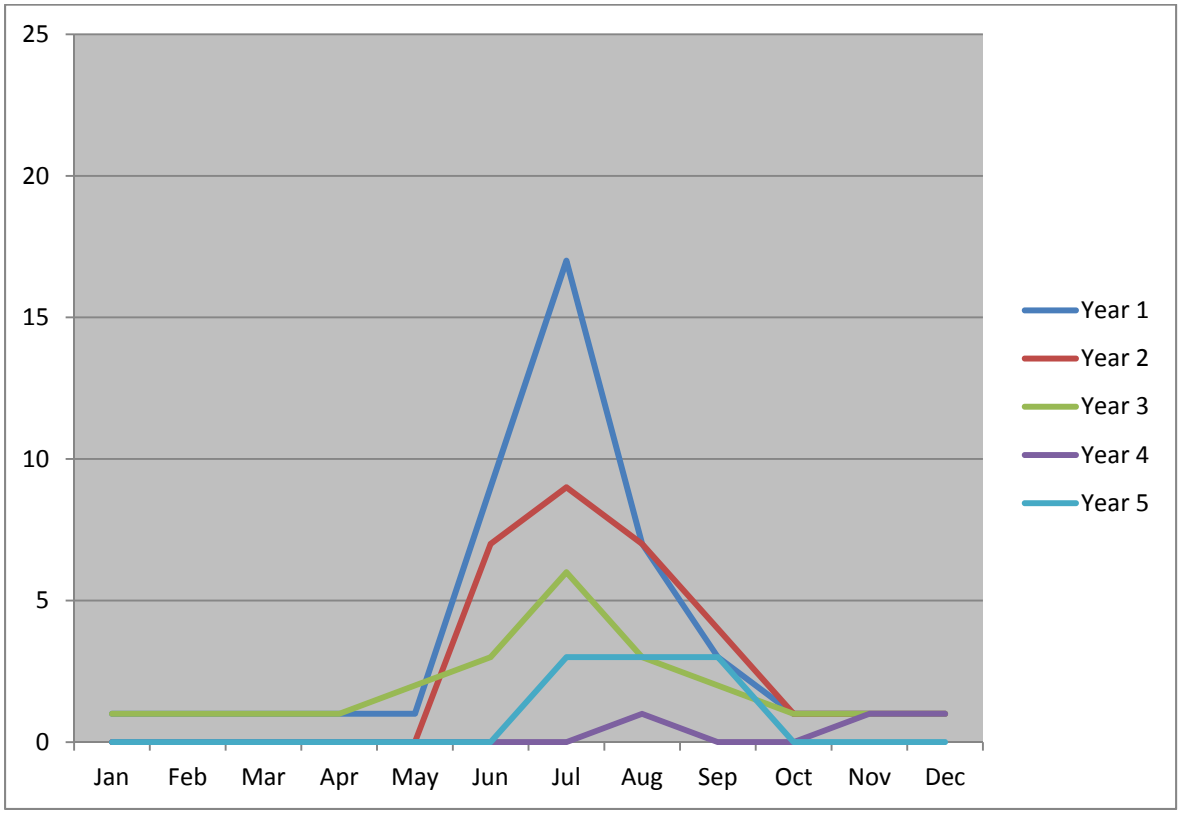


Figure 10: Reported Oil Company Personnel Impacts by Month

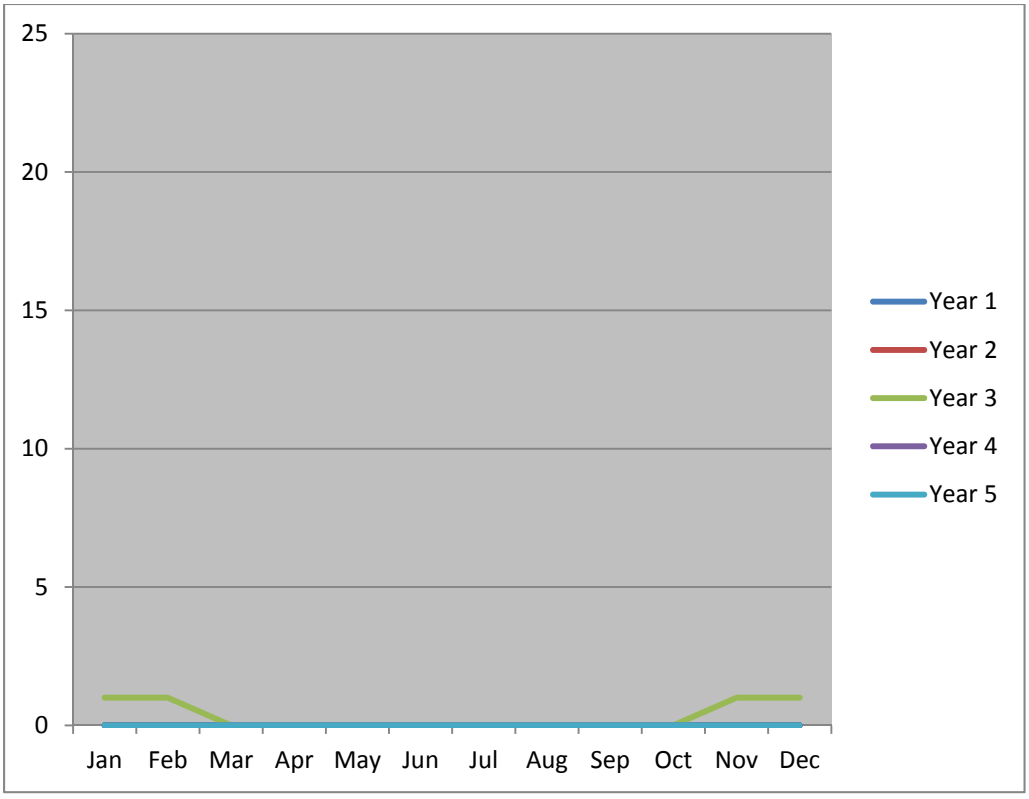


Figure 11: Reported Man-Made Structure Impacts by Month, Years 1-5

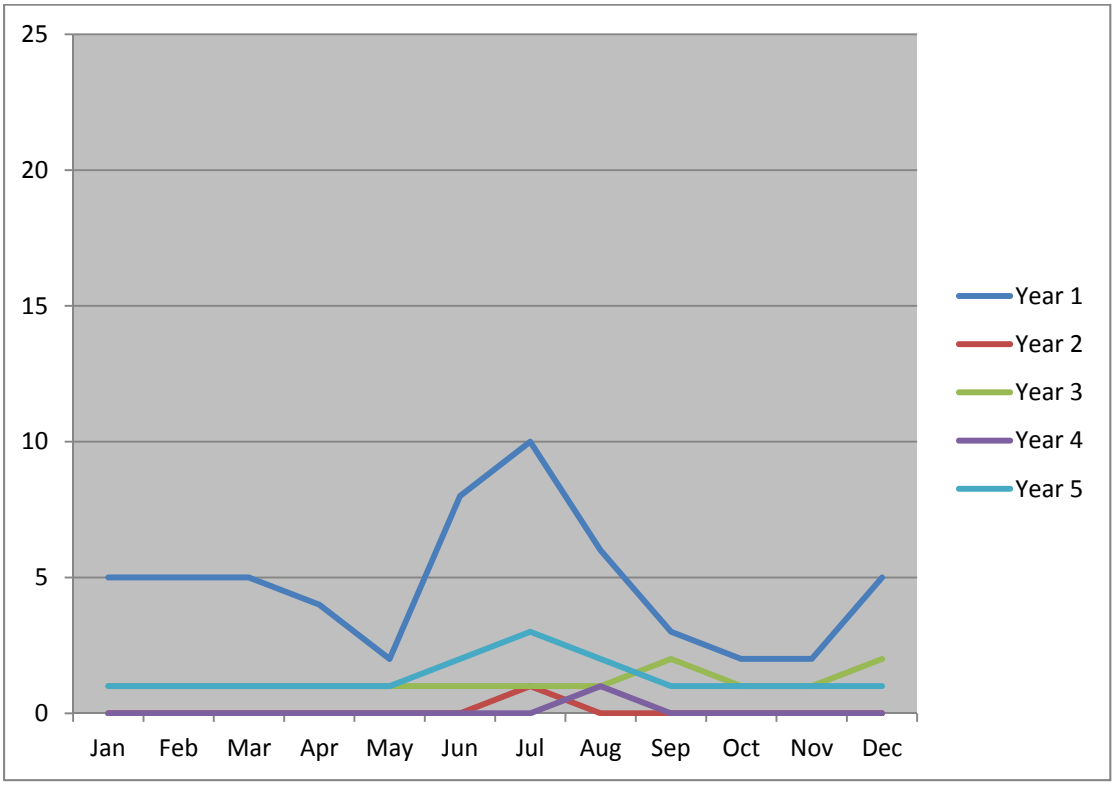


Figure 12: Reported Regulation Impacts by Month, Years 1-5

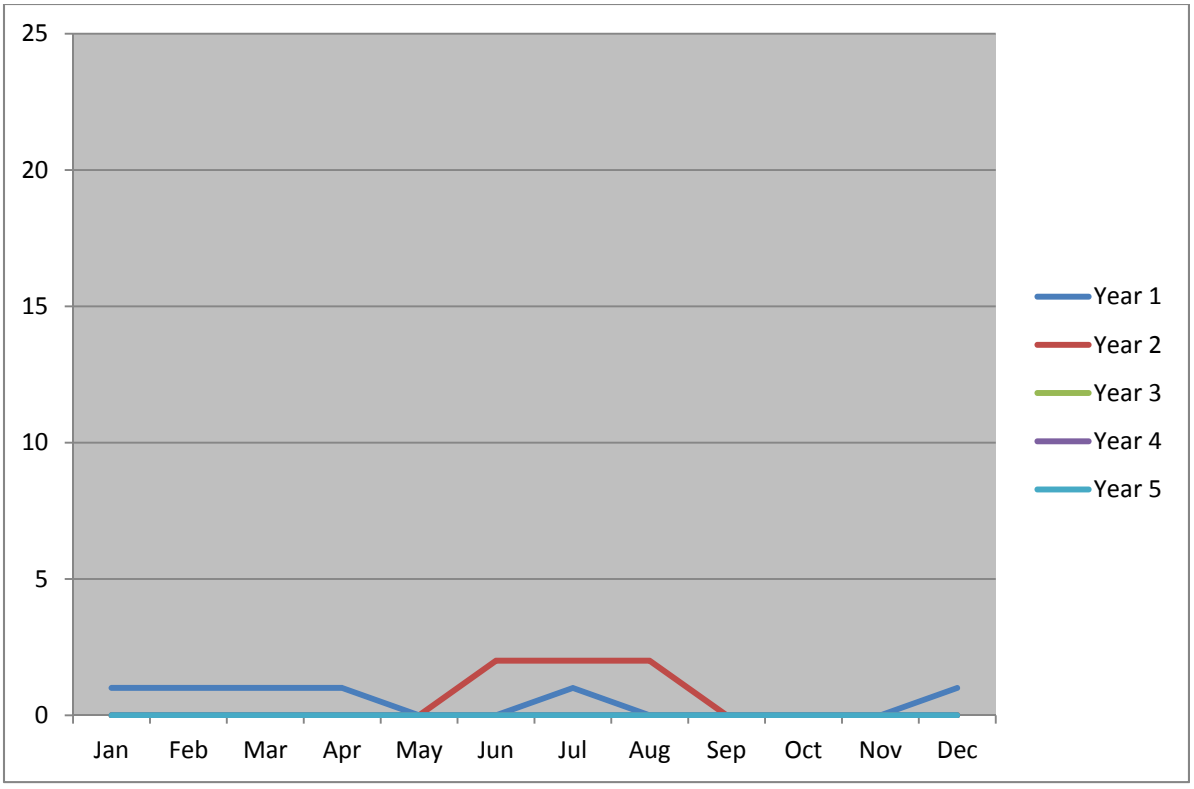
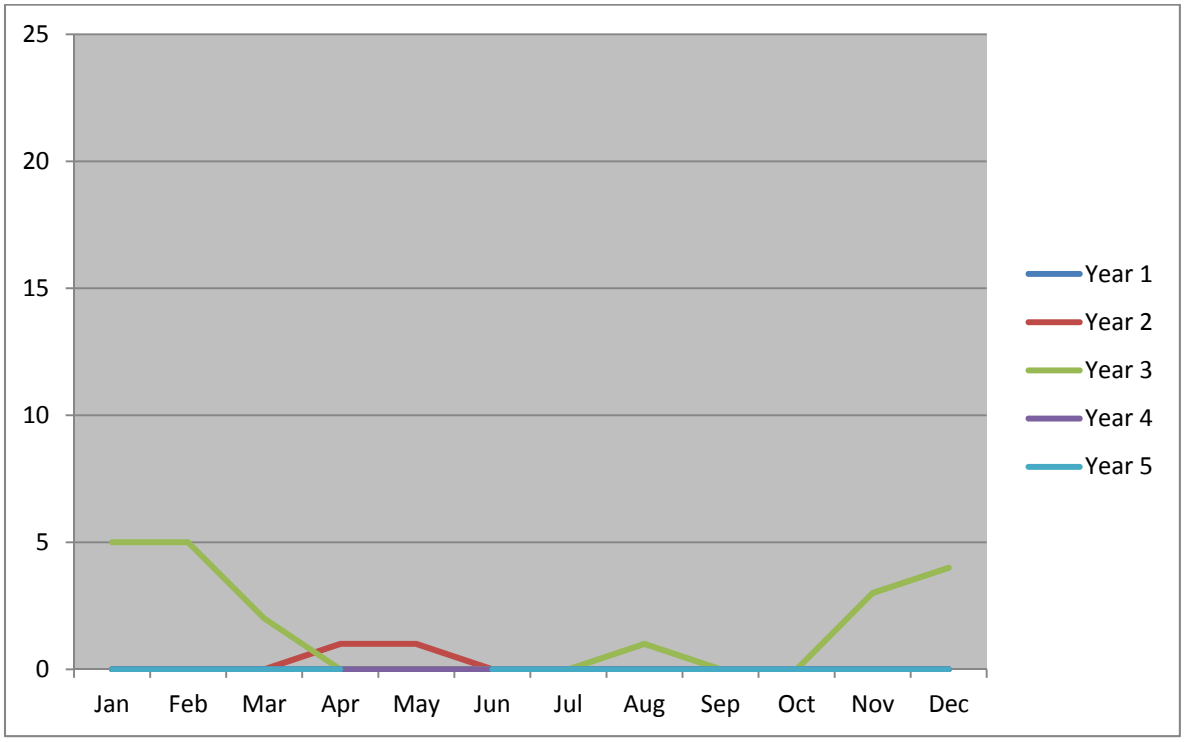


Figure 13: Reported Seismic Line and Activity Impacts by Month, Years 1-5

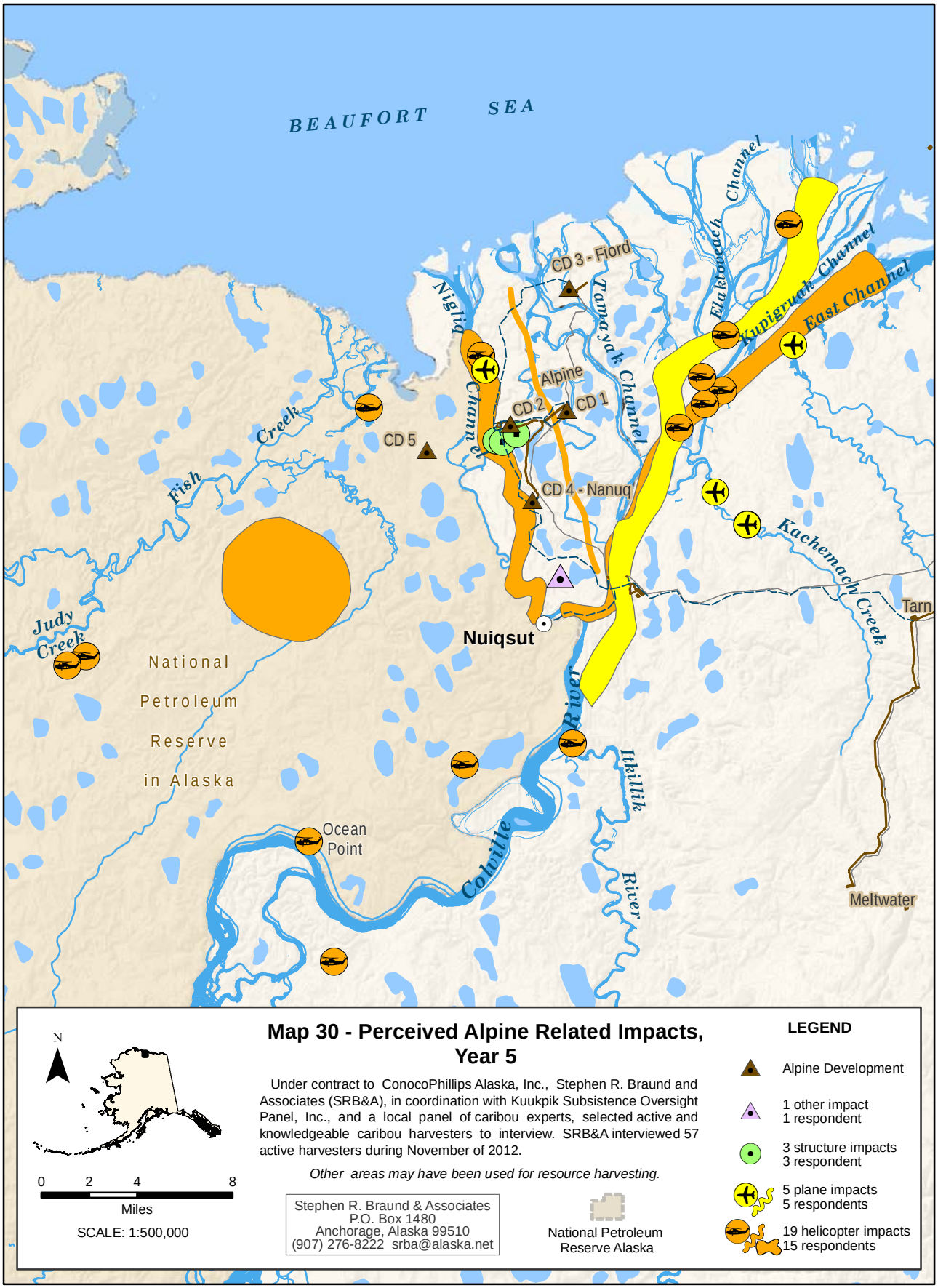


Map 30 shows the locations of impacts reported by Year 5 harvester respondents. The study team generally only recorded impact locations only when the respondent could identify the specific (i.e., point) locations where they were when the impact occurred; however, in some cases, when residents indicated that the impact occurred over a larger area, these impact locations were documented as a polygon instead of a point. Reported helicopter impacts occurred along the East Channel and directly west of the community; impacts were also reported on the Nigliq Channel, near the mouth of Itkillik River, and upriver near Ocean Point, and Chandler River. Structure impacts were reported along the Nigliq Channel, and one respondent reported lights impacting subsistence activities north of the community on Nigliq Channel.

Five respondents reported the location for impacts from planes, four of which occurred on the East Channel and one which occurred up Nigliq Channel just north of where the structure impacts were reported. Compared to Year 4 (SRB&A 2013), Year 5 shows a higher concentration of helicopter and airplane impacts along the East Channel, as well as a higher concentration of helicopter impacts to the west of the community near Fish and Judy Creeks.

Impacts of Helicopter Traffic

As shown in Table 42, 30 percent of respondents reported helicopter impacts in Year 5, a smaller percentage than all study years with the exception of Year 4 (22 percent). Helicopter impacts accounted for 55 percent of the reported impacts during the Year 5 study period. In 10 cases, respondents indicated that the impact involved a "blue and white" helicopter (Table 44). In five cases, respondent cited "Alpine helicopter" as the cause of the disturbance. In four cases, active harvesters were unable to identify the owner of the helicopter or provide a description of the helicopter's appearance. In two cases, respondents described the helicopters as "Air Logistics Helicopter." Helicopter impacts were reported along the East Channel of the Colville River, west of the community and on Nigliq Channel, and south of the community along the Colville River. In some cases, respondents indicated that the helicopter may not have been operated by CPAI, but that it used Alpine facilities; these are represented as Alpine-related impacts.


BEAUFORT SEA
Niglig Channel
Tamayak Channel
Elaktoveach Channel
Kupigruak Channel
East Channel
CD 3 - Fiord
Alpine
CD 2
CD 1
CD 5
CD 4 - Nanuq
Fish Creek
Judy Creek
Kachemach Creek
Nuiqsut
Tarn
Meltwater
National Petroleum Reserve in Alaska
Ocean Point
Colville River
Itkillik River
N
0 2 4 8
Miles
SCALE: 1:500,000
Map 30 - Perceived Alpine Related Impacts, Year 5
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 57 active harvesters during November of 2012.
Other areas may have been used for resource harvesting.
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(907) 276-8222 srba@alaska.net
National Petroleum Reserve Alaska
LEGEND
Alpine Development
1 other impact
1 respondent
3 structure impacts
3 respondent
5 plane impacts
5 respondents
19 helicopter impacts
15 respondents

Table 44: Respondent Descriptions of Helicopters Associated with Impacts, Nuiqsut, Year 5

	Year 3	Year 4	Year 5
Blue and White Helicopter	8	6	10
Alpine Helicopter	4	0	5
Helicopters - Unknown Owner	9	7	4
Air Logistics Helicopter	4	0	2
Blue Helicopter	0	1	0
Blue and Orange Helicopter	0	1	0
Conoco Phillips Helicopter	1	0	0
Red Helicopter	1	0	0
Total	27	15	21
Notes: The above descriptors were derived through respondents' verbal descriptions of helicopters in the region. Residents' responses were coded under the descriptor that most closely matched their verbal description.			

Stephen R. Braund & Associates, 2014

Respondents generally indicated that helicopter traffic resulted in the caribou being disturbed, or being diverted from their migratory path towards another area. Several individuals noted specific instances in which helicopters disrupted the caribou they had been hunting:

> *Yes, the helicopter, when we went downriver [had an impact on our hunting]. There was pretty much a helicopter that was coming from the west, it looked blue and white I guess. It seemed like it was [scaring the caribou] when we were at [NAME]'s cabin. We were looking towards Fish Creek, and we seen a little [group of caribou] and there was a helicopter that went out towards Alpine and then we didn't see them anymore.* (SRB&A Nuiqsut Interview November 2012)

> *I see that they must have been camped over there by Fish Creek. They even landed right in front of me when I was going out. I went right by them. I could see them with my binoculars and it looked like they were coming right towards me. They were low. Blue and white is what they were. Especially when I got over here by Fish Creek. I would see caribou over here and then I would see the helicopter coming, and they [the caribou] would run. And I would say, 'Well, I'm not going over there now."* (SRB&A Nuiqsut Interview November 2012)

> *Yeah. I think they sort of chased off those caribou. They diverted them. Probably like 500 feet [altitude]. They stayed in that area for a while until [the helicopter] took off west. Pretty much right there; they would just go in circles.* (SRB&A Nuiqsut Interview November 2012)

> *Yeah, this one over here – there was a helicopter and an airplane. They went right over us. A helicopter and an airplane. It seemed like the helicopter was almost chasing them [the caribou]. They were pointed down and following them [the caribou]. This was the blue one, maybe a blue and white one.* (SRB&A Nuiqsut Interview November 2012)

One harvester described helicopter activity when they were trying to hunt for caribou along the East Channel, and indicated that a report was called into the KSOP office, who in turn reported the incident to CPAI:

> *Just one time up over here, it was a helicopter. They were surveying and they kept going back and forth to Alpine and there was one time it hovered less than 100 feet for a long time; that kind of distracted the caribou from crossing, because they kept going back and forth, back and forth, and we just called somebody here and let Alpine know; about an hour later they left. The same one [Alpine] blue and white. It will never change.* (SRB&A Nuiqsut Interview November 2012)

One individual indicated that the presence of helicopters to the west of the community resulted in the disturbance of the caribou's migration pattern, whereby the caribou diverted south rather than continuing toward the Nigliq Channel. The respondent described,

> *Caribou start heading south seven or eight miles from the village, because an Alpine helicopter was flying during that time. The [helicopter caused them to] turn too early, to migrate south. ...Alpine helicopters going back and forth to CD5 and like CD6 and 8 and 9. [On the] west side of Nigliq Channel.* (SRB&A Nuiqsut Interview November 2012)

Respondents described the majority of helicopter activity taking place around the East Channel of the Colville River and south of the community near Ocean Point, in addition to farther west toward Fish Creek. Respondents provided the following additional observations regarding helicopter activities within the area,

> *I'd say the pads like the Alpine pads, the helicopters fly over across like the bird watchers or something cause they'd always land on the land and take pictures or something and sometime it's during the caribou migration and they follow them and pretty much every summer. They fly over this whole area CD2, CD5 in July.* (SRB&A Nuiqsut Interview November 2012)

> *Right here is where there was a lot of helicopter traffic you can see a lot of helicopter traffic form the cabins, planes going. Also you can see choppers go back and forth. That was in July and August when I was hunting out in those areas.* (SRB&A Nuiqsut Interview November 2012)

> *We camped there, but there was [a] helicopter at the same time doing their surveys. Lucky they didn't chase them back, they just stayed in one area. We waited to see if the helicopters would come back again. [It was a] blue and white one flying here and there and trying to get caribou watching us. In July, almost end of July.* (SRB&A Nuiqsut Interview November 2012)

> *There's always caribous on this side of Itkillik and not too far from Itkillik-Pa…. I go up inland. There's always caribou there in August. Plus, there's always helicopter flying, doing their survey, and I don't get caribou just for, you know, the helicopter [to come] bother me. There was [a] helicopter doing their survey [over] Itkillik-Pa and on this side of Ocean Point. There's always caribous [there], but there's always helicopters disturbing [them]. That was in August.* (SRB&A Nuiqsut Interview November 2012)

One individual reported experiencing the impacts of helicopter traffic during a hunting trip, but noted that the air traffic more heavily impacted his hunting experience, rather than affecting the caribou themselves. The quote makes an important point that even when caribou are present and available to hunters, industry activity can still negatively affect a harvester's experience on the land:

> *I seen another chopper over here too, By Ocean Point. There was like six boats out there when we were out there. The choppers [were] coming from the Alpine side. I didn't bother to look at the color, but I heard them. It kind of distracted me – I don't think the caribou noticed, they were just bothering me.* (SRB&A Nuiqsut Interview November 2012)

During the Nuiqsut Caribou Panel review meeting in February 2014, panel members discussed the need for a full-time subsistence representative in the community, in addition to the use subsistence representatives during helicopter surveys.

Impacts of Airplane Traffic

Airplane traffic was the third most commonly reported impact during the Year 5 respondent interviews. Eleven percent of respondents reported impacts from airplanes during the Year 5 study period, accounting for 18 percent of all reported impacts (Table 42). Three respondents reported that the plane was a "Twin Otter," two respondents each reported being impacted by a "Conoco Airplane" and "Alpine Airplane," and one respondent reported an impact by a "Cargo Airplane" (Table 45). Respondents reported impacts from planes occurring primarily on the east channel of the Colville River, with one respondent reporting an impact along Nigliq Channel. Several respondents described similar experiences while trying to harvest caribou from a herd on the East Channel, indicating that the caribou ran out of range of the hunters when a plane flew over. These individuals described,

> *That was a cargo plane landing at Alpine….Yeah, it made them [the caribou] run around. It looked like they were trying to run them. They were looking at them and going. We were right there. [It was]*

probably 1,000 feet [altitude]. …We just got to them [the caribou] when the plane flew over. The caribou turned around and looked like they were being chased. We were right in the process of getting them and we lost them [because of the air traffic]. (SRB&A Nuiqsut Interview November 2012)

It seemed pretty low when it flew over; I don't know why Conoco Philips fly so many feet below. When we harvested caribou it came around and circled us and that distracted our hunting grounds. There was another boat, and they were trying to harvest those other caribou, and they were distracted, too. (SRB&A Nuiqsut Interview November 2012)

After we harvested those three caribou, the Alpine plane flew over and was 50 to 100ft off the ground and it was distracting. That was in September. That plane came from Alpine and we out by, where is the island? We were in one of these rivers over here and a herd of caribou up here and that was almost like by the river where we spotted those and go and turn back and go inside river and that plane flew over when we spotted those caribou. (SRB&A Nuiqsut Interview November 2012)

One respondent noted that despite a plane in the area flying low, he did not notice the caribou reacting to it. The respondent stated, "There was a plane going by but it didn't really bother them [caribou]. It was probably the Alpine plane taking off. They were flying pretty low, too" (SRB&A Nuiqsut Interview November 2012).

Table 45: Descriptions of Airplanes Associated with Airplane Traffic Impacts, Nuiqsut Year 5

	Year 3	Year 4	Year 5
Twin Otter	1	0	2
Conoco Airplane	1	0	2
Alpine Airplane	0	1	2
Cargo Airplane	4	1	1
Airplane - Unknown Owner	2	3	0
Cessna	1	0	0
Total	9	5	7

Stephen R. Braund & Associates, 2014

Impacts of Man-made Structures

Impacts related to man-made structures (i.e., physical obstructions or resource deflections due to infrastructure such as pipelines and gravel pads) were reported by 13 percent of Year 5 respondents, compared to five percent in Year 4, nine percent in Year 3, 32 percent in Year 2 and 61 percent in Year 1 (Table 42). The higher percentage of Year 1 respondents reporting impacts related to man-made structures is likely due to researchers in Year 1 collecting data on changes that started since the beginning of the Alpine development. In the case of man-made structures, a number of Nuiqsut residents believe that the pipelines constructed in association with the Alpine development have resulted in general changes to the caribou migration. Years 2, 3, 4 and 5 active harvester interviews focused on recording impacts that occurred during the study time period and that directly affected caribou harvesters. However, some residents in Year 5 continued to make more general comments regarding the impacts of pipelines on the migration or behavior of the caribou:

Ever since the pipeline came in from Alpine to 2L, the caribou migration's been different. When I came in in '93, we caught 12 caribou in by Nanuq, and since then I've never seen them come through that area. Since the pipeline came in, they don't go through the village any more. We caught like 12 bulls, and we never seen caribou in there again. And that's definitely an impact. (SRB&A Nuiqsut Interview November 2012)

I used to watch the caribou, they crawl under the pipeline. It happens at Prudhoe Bay; I used to work there. They run around the pipelines, they stop and finally crawl on under. (SRB&A Nuiqsut Interview November 2012)

The pipeline keeps them from crossing. Not like they were crossing [before], because the Western [Herd] and Porcupine [Herd], they normally come this way, but last two years they've been on Point Thomson side, Prudhoe side, I haven't seen a Porcupine herd in how many years? (SRB&A Nuiqsut Interview November 2012)

Active harvesters who reported experiencing impacts from man-made structures during the Year 5 study period mentioned pipelines and infrastructure (Table 46). Several respondents described not being able to harvest a caribou that they otherwise would have shot, due to the presence of a pipeline. These individuals observed,

When I see caribou out there by the pipeline, I herd them away then shoot them. (SRB&A Nuiqsut Interview November 2012)

The ones that are one this side close to Alpine. Hard tundra. Cause they were coming towards the river but then they were going the other way. I don't know. Loved to have gotten them but the pipeline was in the way. Can't shoot towards that one. I didn't spot very many of them. I haven't seen any seismic, no. (SRB&A Nuiqsut Interview November 2012)

The impact I would say would be the infrastructure. Caribou they like the pads because it is a sanctuary. They know they are not getting shot or hunted there. We spent a whole day just waiting on them to [cross over]. Right in Nanuq area. Some scattered caribou and wasn't large or significant. Three there, four there, one there, what have you. (SRB&A Nuiqsut Interview November 2012)

One respondent reported difficulty crossing under pipelines during the winter when traveling by snowmachine, due to snow drifts that decreased clearance in certain areas:

During winter time, we always have to – because the pipeline is so low right now, and during winter time it [gets] drifted, and crossing gets a little too low and we have to look for a place to cross where it's high enough to go through. Yeah, [this happened] while I was out caribou hunting in April. Just this area, from Alpine right here. This is the pipeline that goes to Alpine. It gets low right here and some places it is high, like [from] CD1 to CD4. Kind of high [there], alright. (SRB&A Nuiqsut Interview November 2012)

Table 46: Descriptions of Sources of Man-Made Structures Associated with Impacts, Nuiqsut, Year 5

	Year 3	Year 4	Year 5
Pipeline	2	1	6
Infrastructure	1	1	1
Other	0	1	0
Ice Roads and Bridges	2	0	0
Total	5	3	7

Stephen R. Braund & Associates, 2014

Impacts of Regulations

Only one respondent noted that they had experienced Alpine-related impacts as a result of regulations during the Year 5 study period (Table 42). The respondent reported that safety buffers around Alpine infrastructure affected their hunting activities:

Yeah right now it is difficult to go to Alpine because they have a buffer zone in that area where we can't enter within two miles of buffer zone and that impact the hunters too[9]*. Most of the time they used to be a lot of caribou towards Alpine but that has changed a lot. Too many [regulations].* (SRB&A Nuiqsut Interview November 2012)

[9] According to CPAI, the safety buffer around Alpine facilities is 1,000 feet, not two miles.

Another respondent discussed his general avoidance of the Alpine area due to concerns about not properly following the safety guidelines; however, the observation was not reported as a Year 5 impact. This individual observed,

> *We get these fliers in the mail about Alpine safety and it talks about using firearms around pipelines and all that other stuff. ConocoPhillips is always stressing that, so it kind of scares us off a little bit. I don't go over there [toward Alpine]*. (SRB&A Nuiqsut Interview November 2012)

Other Impacts

Only two respondents noted "other" Alpine-related impacts during Year 5 interviews (Table 42, Table 47). In both cases, respondents reported more general concerns related to lights and flares from development in the area. These two respondents described,

> *I hadn't seen nothing, other than lights at night. Just when you're coming in from this side, you can see the lights; that's the only thing. [It can be] somewhat distracting – it's irritating. Because I remember on the blue moon days you can see Prudhoe Bay when I was a kid. [It is] hard to say if they caribou are affected. Normally if you see lights, you wouldn't want to be hunting in that direction.* (SRB&A Nuiqsut Interview November 2012)

> *Just the flares that are always going. I kind of think that's why they are getting sick. Flares are on 24/7, and I think that mercury is making them sick. The [pollutants are in the] air and drops down to the ground, and [gets on] the food that the caribou eat.* (SRB&A Nuiqsut Interview November 2012)

Table 47: Sources of Other Impacts, Nuiqsut, Year 5

	Year 3	Year 4	Year 5
Other	1	3	2

Stephen R. Braund & Associates, 2014

Non-Alpine Impacts

In 46 cases, Nuiqsut active harvesters reported "non-Alpine" impacts. In these cases, respondents indicated that the impact was from a different source, or they were unsure of the source of the impact and the study team assigned the impact as "non-Alpine" due to its location (i.e., outside of the general area of current or planned Alpine Satellites developments). As shown in Table 48, 55 percent of Nuiqsut respondents reported at least one type of non-Alpine impact in Year 5. A majority of these reported impacts were related to helicopter traffic (42 percent of observations) or airplane traffic (33 percent of observations). The percentage of respondents reporting non-Alpine impacts was highest in Year 5 compared to all previous study years.

Table 48: Non-Alpine Impacts on Caribou Hunting, Nuiqsut, Years 1-5

	Percent of Respondents					Percent of Observations				
	Y1	Y2	Y3	Y4	Y5	Y1	Y2	Y3	Y4	Y5
Helicopter Traffic	11%	9%	2%	7%	32%	22%	45%	33%	40%	43%
Man-made Structures	6%	4%	0%	0%	2%	11%	18%	0%	0%	2%
Plane Traffic	17%	6%	4%	5%	27%	39%	27%	67%	40%	34%
Other Traffic	3%	0%	0%	0%	4%	6%	0%	0%	0%	4%
Oil Company Personnel	0%	0%	0%	0%	5%	0%	0%	0%	0%	6%
Regulations	3%	0%	0%	0%	4%	6%	0%	0%	0%	4%
Seismic Lines or Activity	0%	2%	0%	2%	0%	0%	9%	0%	10%	0%
Other	8%	0%	0%	2%	5%	17%	0%	0%	10%	6%
Any Impact	31%	15%	5%	16%	55%					

"Non-Alpine" impacts in Year 5 frequently occurred near Umiat. The most common complaint was related to helicopter and plane traffic upriver from the community, where residents hunted for caribou and moose:

> *Not that I know [impacts related to Alpine], but I notice that with down here, the upriver [hunting] is starting to be affected by the stuff out here. I know that with what's going on with Umiat, there are going to be changes going on; I believe that there is talk of a permanent road to Umiat, a haul road. There's that one helicopter that's white and blue down here [around Umiat], and the usual plane. You can tell it's like, they do a lot of ice road stuff. They make an ice road to Umiat, and after they started doing that, that's when you started* noticing *the changes around there. They [the caribou] are less around, [and] they are more scattered. They [the caribou] know they are going to have to start staying away from that area [around Umiat]. It's kind of – the closer you get to Umiat the more you see it [impacts on the caribou] and whatnot.* (SRB&A Nuiqsut Interview November 2012)

> *When we were out in Umiat, just before Umiat there was a lot of chopper activity flying all day.] I didn't see no planes, or well actually I did see a plane up here [further downriver]; it went to Umiat, though. I think it was red, the helicopter. It was quite a bit distracting, we were hoping we would catch a moose up there, but wrong place at the wrong time, I guess. I think they were surveying the land; it was flying all day, landing in other places.* (SRB&A Nuiqsut Interview November 2012)

> *Yeah, it has to do with that road, a lot of helicopter traffic. My boys saw and even got them on video. It was even [bad] enough to say that my boys were tweaked by those people flying around. They could be hunting and then a helicopter would come up and scare the animals away.* (SRB&A Nuiqsut Interview November 2012)

Other reported sources of non-Alpine impacts included commercial airlines, other oil companies, non-local tourists, sport hunting outfits, and Federal agencies conducting scientific research. Several individuals made the following comments:

> *There was some around this area when we went to go check our net doing hover rounds or something. [It was] Era, that red one going back and forth. They [the caribou] were gonna try and cross the river, but they turned around. That's when we saw this one [plane] here. Because we were there at my [Uncle]'s camp picking eggs and they were there and scared them [caribou] off.* (SRB&A Nuiqsut Interview November 2012)

> *When we came up the first time and got this one there was one coming from – you know where they [other oil company] had that [oil] spill? Going back from the village and Prudhoe; I guess they scared those [caribou] off because they kept going to that spill in the chopper from Deadhorse to the site to the village, back to the site.* (SRB&A Nuiqsut Interview November 2012)

> *Yeah, I think when we were up moose hunting – it could've been a Wildlife [Department] or [Alaska Department of] Fish and Game plane or the troopers, we saw one of them planes at Ocean Point. Still they, I think they kind of effect [the caribou]…. It was going low; you could tell they were scanning the land, in August.* (SRB&A Nuiqsut Interview November 2012)

> *It [a plane] was blue and white and something or some company – trophy hunters maybe, I am not sure where it was but there was a plane landed. It was on the baby mountains, we call them 'kikpuks' but I don't know what they are. And then there's like, around here, there's one huge stretch, nothing but, gravel like, have you heard about that one cave? It's about like there. We didn't see no tents, no people, nothing [around the plane]. My brother was a witness, my best friend, my brother's wife [all saw the plane]. We were guessing it might be a trophy hunter. It was blue, red, and white, with yellow at the tip of the tail.* (SRB&A Nuiqsut Interview November 2012)

> *[I noticed] campers out there – other people, not local. Most people seen them with their loud jet boats and stuff. It was upriver somewhere, past Ocean Point, by Chandler. Like, I don't know how many miles, but somewhere around there, because when we were camping they were right there. Lot of noise,*

you could see caribou out there scouting on the hills, so they could hear the noise. The jet motor was loud as heck, definitely scared like three caribous away. (SRB&A Nuiqsut Interview November 2012)

They look for like a shallow hazard. And they look for potential shallow areas where the water's gonna go to the bottom. Last summer I had a problem with [oil company] because they were doing their shallow hazard in July and I said, 'You can't do that now; you have to do that in September when the water goes down." I told them if I see those guys out there waiting for a bearded seal to come I tell you what I'm gonna [be angry]. [It was] on the west side of Nigliq and they were working their way eastward, working their way to 'Uvuluk' Island. I told them, 'You guys better watch out; I'm gonna take it seriously if I see your boat.' (SRB&A Nuiqsut Interview November 2012)

Over here there's more traffic, with all [the] Repsol [exploration][10]. We had to call KSOP and have them call Alpine security or the person that's in charge to tell that chopper to turn back to Alpine... They are flying out of ConocoPhillips. But that chopper, when they finally informed the chopper, the pilot started hovering and flying really low and zig-zagging. After that he turned back and headed to Alpine. They didn't come back until three or four hours [later]. (SRB&A Nuiqsut Interview November 2012)

During the Nuiqsut Caribou Panel review meeting in Year 5, panel members discussed non-Alpine activities which they believe affect the availability of caribou in the area. These include oil and gas exploration farther to the west of the community (toward Wainwright), and the impacts of sport hunters along the Dalton Highway. Panel members indicated that there are "more and more" hunters along the Dalton Highway each year.

General Observations Regarding Status of Caribou Herds in Year 5

This section summarizes residents' general Year 5 observations relevant to the behavior, distribution, or migration of caribou in 2012. This section includes observations that cannot be organized into the sections above, or observations made during the final section of the active harvester interviews, where respondents were asked, "Was there anything else abnormal about the behavior, distribution, or migration of caribou in 2012?" Review of residents' general observations revealed five themes: general observations about the caribou migration, general observations concerning caribou herd size, general observations concerning the health of the caribou, observations concerning traffic in the area, and observations related to the overall impacts (or lack of impacts from development) during Year 5.

Year 5 respondents' observations about the caribou migration primarily concerned several observations of unusual patterns: an atypical migration from the west (i.e., Teshekpuk Herd) during Year 5, late timing of the caribou migration, and scattered herds. As one individual said, "What migration?! There was no migration! There was only one bunch of a hundred, less than a hundred was the biggest group" (SRB&A Nuiqsut Interview November 2012). Others described that, in general, there were few caribou present in the areas where they usually hunt; in particular, residents observed that the caribou did not cross the Nigliq Channel as they have during some previous years, instead turning back to the west or south:

For some reason our caribou on the west side didn't come. They wintered, summered, and wintered again in Wainwright. So the pattern is changing, maybe because of the industry is expanding and that's how we look at it. Because all this west side is undeveloped so why is that when you're supposed to be there, why aren't they? (SRB&A Nuiqsut Interview November 2012)

It was pretty low [caribou migration] this year, not that many, most I heard was that thousand from Nanuq that's as many as I heard of but I knew that was the first herd to cross the river though, they said something like 50 thousand coming from Teshekpuk from the east, but we never see that herd coming.

[10] It is a CPAI policy that Repsol does not use Alpine facilities except in the case of an emergency situation.

Even though we went out a few times, usually we see them if we go to Nigliq. (SRB&A Nuiqsut Interview November 2012)

When I was nine I remember seeing lots of caribou coming through. Like go through Nigliq from the west. If the been affected by something they use a different route. Not all the ones will be using the same area. But when they head back, they'll use another direction. I think they maybe go like that [back and forth] So you see bulls on this side of the land, you see females normally on this side of the land [east] up the river. That's why you see kids go down there. I say I use the same route so when I get one I just put it on the back and go. (SRB&A Nuiqsut Interview November 2012)

They were just far and few between this year it seems like. Not sure if the herds are not making through Atigun or that Umiat job, we just are not seeing the big numbers we used to see. Maybe the herds are getting rerouted because of that Umiat job. We talked to Fish and Game and he said a lot were getting rerouted by that Umiat Road and turning them around. I don't know how many people got caribou, but we are not seeing our big numbers. Far and few between. (SRB&A Nuiqsut Interview November 2012)

Several harvesters reported having witnessed the caribou change direction when attempting to cross the Nigliq Channel by CD2. Two respondents described the behavior of the caribou in that area, saying,

Central caribou herd went by along this Fish Creek, Where's CD2? They came along the coast line and come in this creek, maybe like 10,000? Late August? Then ah, they wanted to cross by CD2, and swim for a little bit, then [they] all turned around-all those caribous went back-a week later those caribous were sighted in Barrow. They all turned around. We didn't get any of those caribou that year. They all just turn around and they all just start running all the way back to Barrow. (SRB&A Nuiqsut Interview November 2012)

This past spring when caribou came up, they were trying to cross the channel and every one of them was skittish. They didn't know which direction to go. Last year people chased them all over the delta. You gotta leave that first batch of caribou go through to make the trail. There were people who were too anxious and broke up the herd. Later we found out caribou went all over the delta but they never went past that Nigliq Channel. (SRB&A Nuiqsut Interview November 2012)

Residents commonly attributed the changing caribou migration to the presence of pipelines in addition to disruptions from helicopter traffic. In addition, a few individuals believed that pressure from hunters or predators such as wolves had disrupted the migration of the caribou. One individual provided a general description of how helicopter traffic affects his caribou hunting activities and the distribution of caribou near Nuiqsut:

Well, [all] I would like to add is about what I'm going to say if I'm going out caribou hunting. I like to go out caribou hunting and I don't like to go, I don't like any helicopters to interrupt my hunting. Every time I go out, there is always a helicopter flying, flying, flying. Like always a helicopter flying. Sometimes they fly high, sometimes they fly medium, sometimes they fly low. I think…[the caribou] stay away from… [the helicopters]. [The helicopters keep] bugging the caribou. It seems like they were chasing the caribous out of town sometimes. I realized that, 'Oh no, they're gonna chase the caribou southwest, more [farther] out, and give us a hard time getting the caribou by Nuiqsut.' Some people say you don't have to complain about this on the VHF. I just want them to hear [the complaints], so I just wait for the oil companies and I talk about this. So I stopped going out there because there was helicopter traffic in summer time. [Caribou] used to walk around in the village, [we] used to shoot them. (SRB&A Nuiqsut Interview November 2012)

Others provided the following thoughts regarding the various sources of impacts on caribou movement and distribution:

The pipeline, wish they could change it to make it more dull. They [the caribou] think it's ice, so they think they need to stop and go back from where they come from. Summer time I can see it from my house. Pipeline and helicopters [are] probably the two main distractions for caribou in this area. That pipeline needs to go. (SRB&A Nuiqsut Interview November 2012)

I'm basically all over the same areas. I'd say the pads like the Alpine pads, the helicopters fly over across like the bird watchers or something cause they'd always land on the land and take picturess or something and sometime it's during the caribou migration and they follow them and pretty much every summer. They fly over this whole area – CD2, CD5 [in] July. (SRB&A Nuiqsut Interview November 2012)

Well, um, like I said the caribou migration pattern is getting farther and farther away from the village and being impacted by oil companies and air traffic, and many wildlife in our area and the musk ox and the wolves making our – and I noticed that the caribou are spooky due to the increase of musk ox and wolves in the area. (SRB&A Nuiqsut Interview November 2012)

Central caribous used to be all over this area [around Colville Delta] and all the way down here. Now up here – nothing. No wildlife, no animals, they are scared. From the wolves. I don't know if they are having an effect. I think it's the oil companies. The pollution [from industrial activities]. (SRB&A Nuiqsut Interview November 2012)

Others expressed the view that helicopter traffic did not disrupt the caribou, with one individual saying,

There've been choppers flying over, but they haven't been affecting the caribous. When they do land in that area, they [the caribou] walk away from them. They walk away from everything. When I go out, they land somewhere around here. They mark it and land to check something, like a camera, or something like that. There's a pole there with a camera. So these choppers take these routes every day. Doing their own study – looking at the animals, just doing their own work, so I smile at the camera. (SRB&A Nuiqsut Interview November 2012)

One individual expressed concern about development of CD5 and its potential effects on caribou. This individual discussed the potential impacts of a new pipeline in the area on the migration of the caribou, saying,

Once they connect CD5 to CD2, they will have a big effect on our caribou. I don't think they will be going from CD5 and reach Fish Creek. That is what the elders are saying. I learn that from the elders. They have known when they discovered Prudhoe Bay, [and] at Kuparuk, they [elders] see the migration route has really changed from the eastside because of pipeline going on around there. (SRB&A Nuiqsut Interview November 2012)

One respondent reported having more success harvesting caribou during Year 5, but also acknowledged that this was in contrast to other hunters. This individual observed,

It seemed easier for me to catch them. They were there for the picking. I must have done something right. I feel lucky, because a couple guys kept going out 10, 20 times and only caught 3 caribou each. (SRB&A Nuiqsut Interview November 2012)

When discussing herd size, active harvesters generally noted that they had observed smaller groups of caribou than they remembered from the past with one respondent noting, "Herds are smaller, never see the big herds, not sure why." Another respondent provided descriptions of the changes they had observed regarding herd size, describing,

Sometime in early 2000s, I haven't seen [large herds like] that since. By the cabin, we saw that cabin, this whole area along this side we saw hundreds. Maybe 2001. But now I see only troops maybe twenty thirty at a time. Next time you see maybe bulls, then you see smaller, like troops. I don't' know. They just probably stay together until they bother them then they scatter, from brown bear or wolverine, scare them and the other herd turns. That what I'm thinking that may happen. Two guys been talking about eight wolfs so far the past couple weeks they been after them just tracking their tracks. If they been bothered by wolves the go in all different directions. They getting hungry every animal gotta eat what they used to get, like caribou or mice, they gotta eat it. These guys will travel to find food, just like us. They don't have a store like us. So they go look for them all over, and when the caribou sees them, they scatter. (SRB&A Nuiqsut Interview November 2012)

A number of respondents compared Year 5 to the previous year (Year 4) and noted that the caribou were more available in Year 4. As one respondent observed, "I don't know why we have less caribou this summer compared to last summer. Last summer we had more caribou, but this summer there was hardly any caribous out there" (SRB&A Nuiqsut Interview November 2012). Another topic that respondents brought up was the overall health of the caribou in Year 5. Several respondents observed an increase in the number of sick caribou in Year 5, with two individuals saying,

> *Just a lot of stories of abscesses, a lot of green pus. That's my main concern and a majority of stories that I heard – I don't know if that is what you've been hearing. I don't know [why]. I honestly don't know where that caribou could've come from – Umiat or Nuiqsut? I don't know; it was in pretty bad shape…it didn't even want to move.* (SRB&A Nuiqsut Interview November 2012)

> *I got a question about the caribou. They are getting caribou with green slime between the skin and the meat. I know four to five people who took some samples and sent it over to Barrow for them to evaluate. I didn't see anything from them. It would be wise for you to push people and have them come here and present what they find. More and more are having that slime and we need to know what it is.* (SRB&A Nuiqsut Interview November 2012)

A couple of respondents observed an increase in the number of reindeer being harvested in Year 5. These individuals said,

> *Reindeer are starting to be in there. We see in herds. More than in the past. How many locals got reindeers from western herd coming in, and when I heard there was reindeer that was when I go try my luck and go to creek and had to turn around. They usually breed, I don't know if they breed with caribous.* (SRB&A Nuiqsut Interview November 2012)

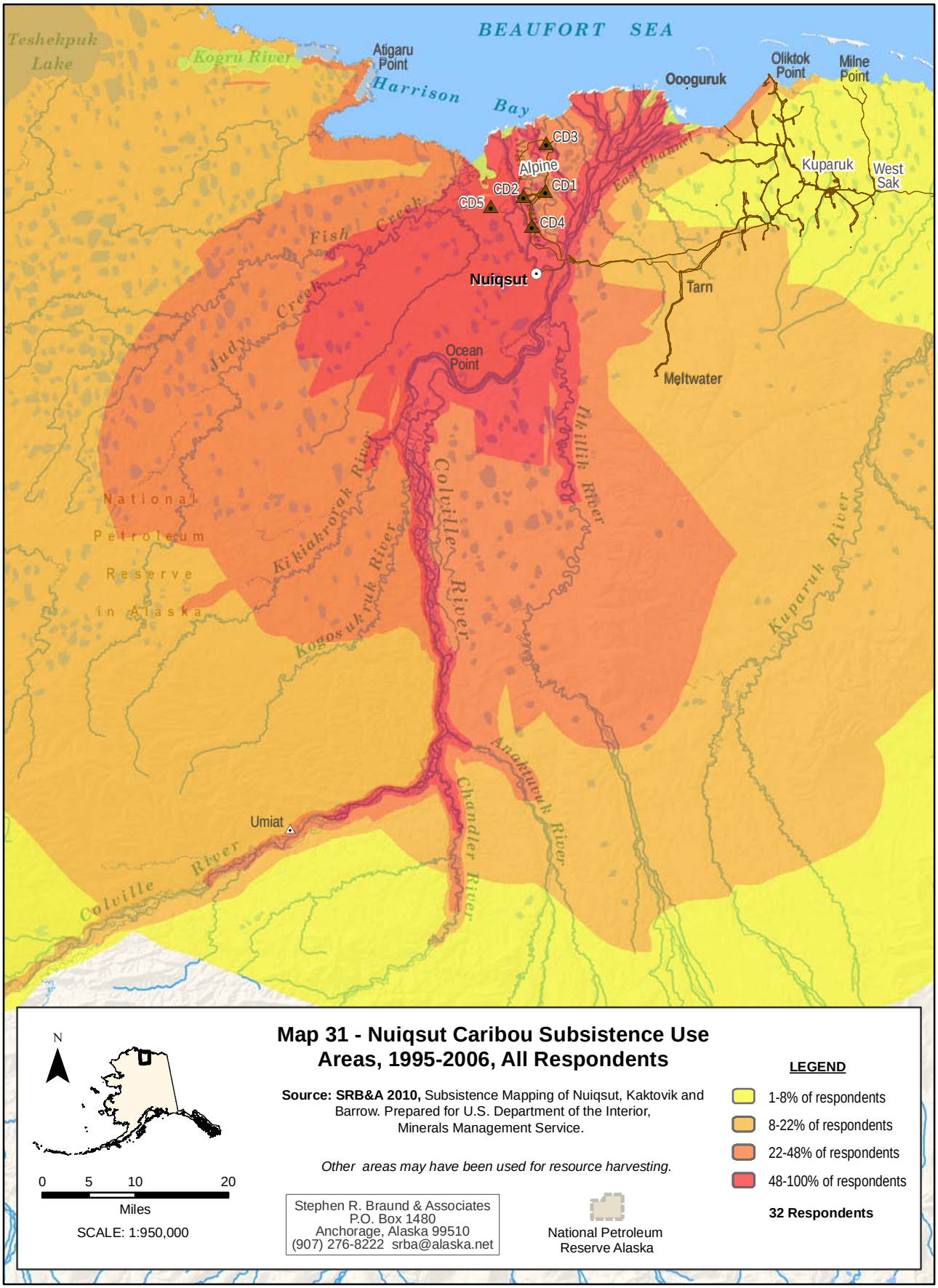
> *More reindeers in that [Western Arctic Caribou] herd than those from east side and that is why we see more from the west side herd. That is good thing cause reindeer is really good meat. They have more fat than the caribous and skin is softer than the caribou that we have. Hopefully I get one.* (SRB&A Nuiqsut Interview November 2012)

Caribou Hunting and Harvesting Patterns Over Time

This section incorporates and/or discusses previous harvest and subsistence use area data and descriptions, including information on caribou harvest amounts, subsistence use areas, and the timing of hunting activities. Historic caribou harvest data over time are provided in Table 18. The importance of caribou to the community of Nuiqsut over time is evident in those data, with over 90 percent of households using caribou during each available study year since 1985. Per capita harvests have ranged between 73 and 228 pounds. More recent harvest data from the 2000s have shown harvests remaining relatively stable, ranging from 102 to 157 pounds per capita. Previous studies have also noted the relative stability of caribou harvests in Nuiqsut, with Pedersen et al. (2000) stating, "During the observation period, caribou harvests remained relatively productive, even though Nuiqsut hunters hunted in more constrained areas."

In addition to harvest studies, previous research has documented subsistence use areas for the community of Nuiqsut. All available subsistence use area data for the community of Nuiqsut are provided in the Year 4 report for this study (SRB&A 2013). In its mapping study for the 1995-2006 time period (SRB&A 2010b), SRB&A employed the same "overlapping use areas" method used in the Nuiqsut Subsistence Caribou Monitoring study. In this study, respondents were interviewed once regarding their subsistence use area over the previous 10 year period in contrast to the data gathered annually during this study. In addition, the data represent two different time frames (a 12 year period versus a five year period), and this should be kept in mind when comparing the two data sets.

Maps 31 and 32 show the overlapping Years 1 through 5 (2008-2012) use areas and the overlapping 1995-2006 use areas. SRB&A merged each respondent's use areas so that each map shows only one polygon per respondent. The study team also applied an overlapping use area method to each data set which assigned



Map 31 - Nuiqsut Caribou Subsistence Use Areas, 1995-2006, All Respondents

Source: SRB&A 2010, Subsistence Mapping of Nuiqsut, Kaktovik and Barrow. Prepared for U.S. Department of the Interior, Minerals Management Service.

Other areas may have been used for resource harvesting.

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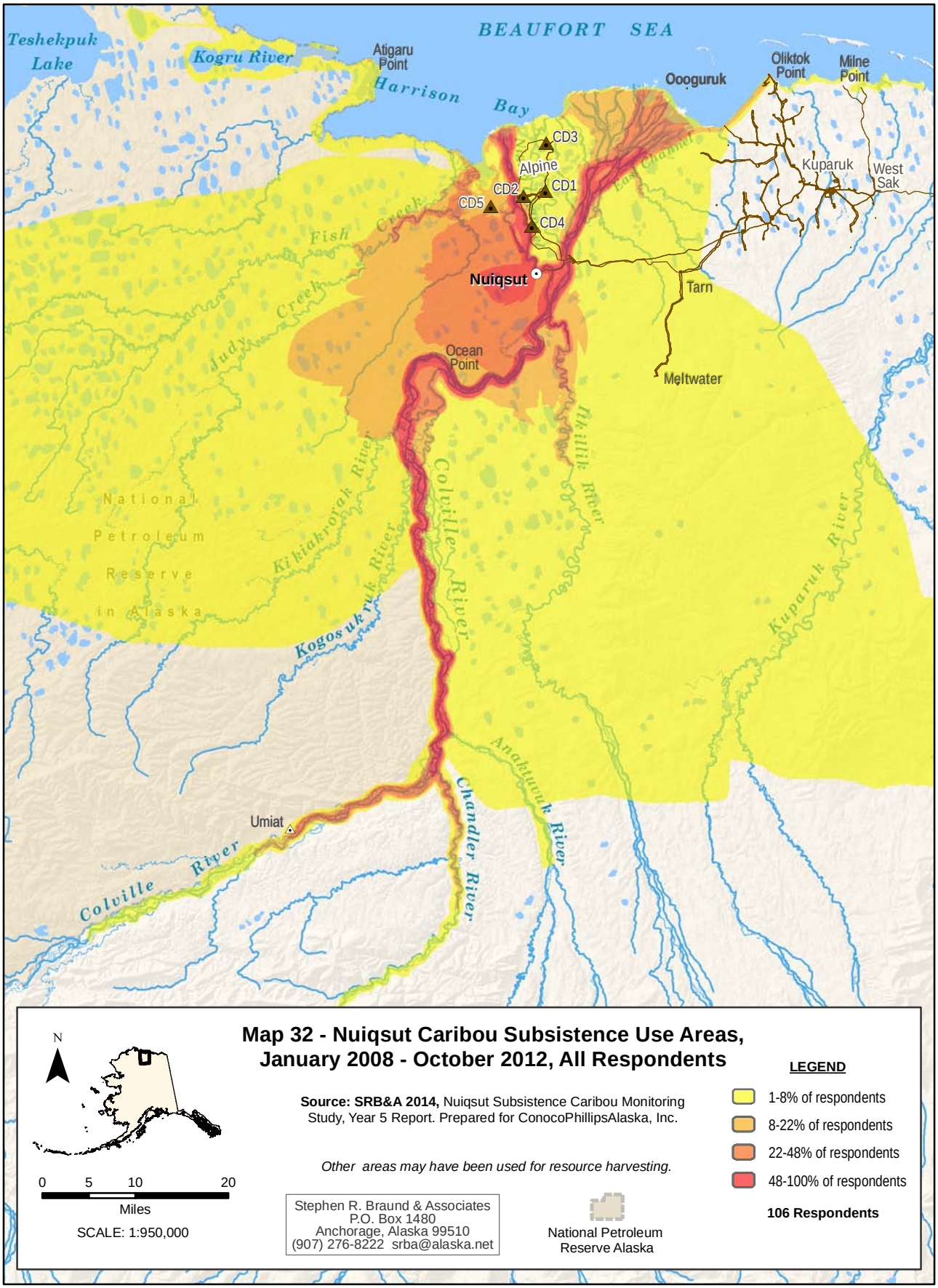
National Petroleum Reserve Alaska

LEGEND

- 1-8% of respondents
- 8-22% of respondents
- 22-48% of respondents
- 48-100% of respondents

32 Respondents


BEAUFORT SEA
Teshekpuk Lake
Kogru River
Atigaru Point
Harrison Bay
Oooguruk
Oliktok Point
Milne Point
CD3
Alpine
CD2
CD1
CD5
CD4
Kuparuk
West Sak
Fish Creek
Judy Creek
Nuiqsut
Tarn
Ocean Point
Meltwater
National Petroleum Reserve in Alaska
Kikiakrorak River
Colville River
Itkillik River
Kogosukruk River
Kuparuk River
Anaktuuk River
Chandler River
Umiat
Colville River
N
0 5 10 20
Miles
SCALE: 1:950,000
Map 32 - Nuiqsut Caribou Subsistence Use Areas, January 2008 - October 2012, All Respondents
Source: SRB&A 2014, Nuiqsut Subsistence Caribou Monitoring Study, Year 5 Report. Prepared for ConocoPhillipsAlaska, Inc.
Other areas may have been used for resource harvesting.
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National Petroleum Reserve Alaska
LEGEND
1-8% of respondents
8-22% of respondents
22-48% of respondents
48-100% of respondents
106 Respondents

shading (from yellow to red) under four categories. Therefore, the red on Maps 31 and 32 depicts the top category of overlapping use, where between 48 and 100 percent of respondents reported use areas, and the yellow depicts the lowest category of overlapping use, where between one and eight percent of respondents reported use areas. Maps 33 and 34 show only the respondents who participated both in the 1995-2006 study and in the Nuiqsut Subsistence Caribou Monitoring study.

In general, the 10 year mapping study shows a greater extent of caribou use areas than for Years 1 through 5, likely due in part to the larger study period (Map 32). An overall comparison of the two data sets indicates less use of the middle Colville Delta in more recent years, fewer overlapping use areas in overland areas to the west and southeast of the community, and fewer overlapping use areas along Fish Creek. When comparing only the respondents who participated in both the 1995-2006 study and the more recent monitoring study (Maps 33 and 34), the differences are still present but less dramatic. Because the current study covers only one year (rather than 10 years), harvesters may be more specific when identifying their hunting areas.

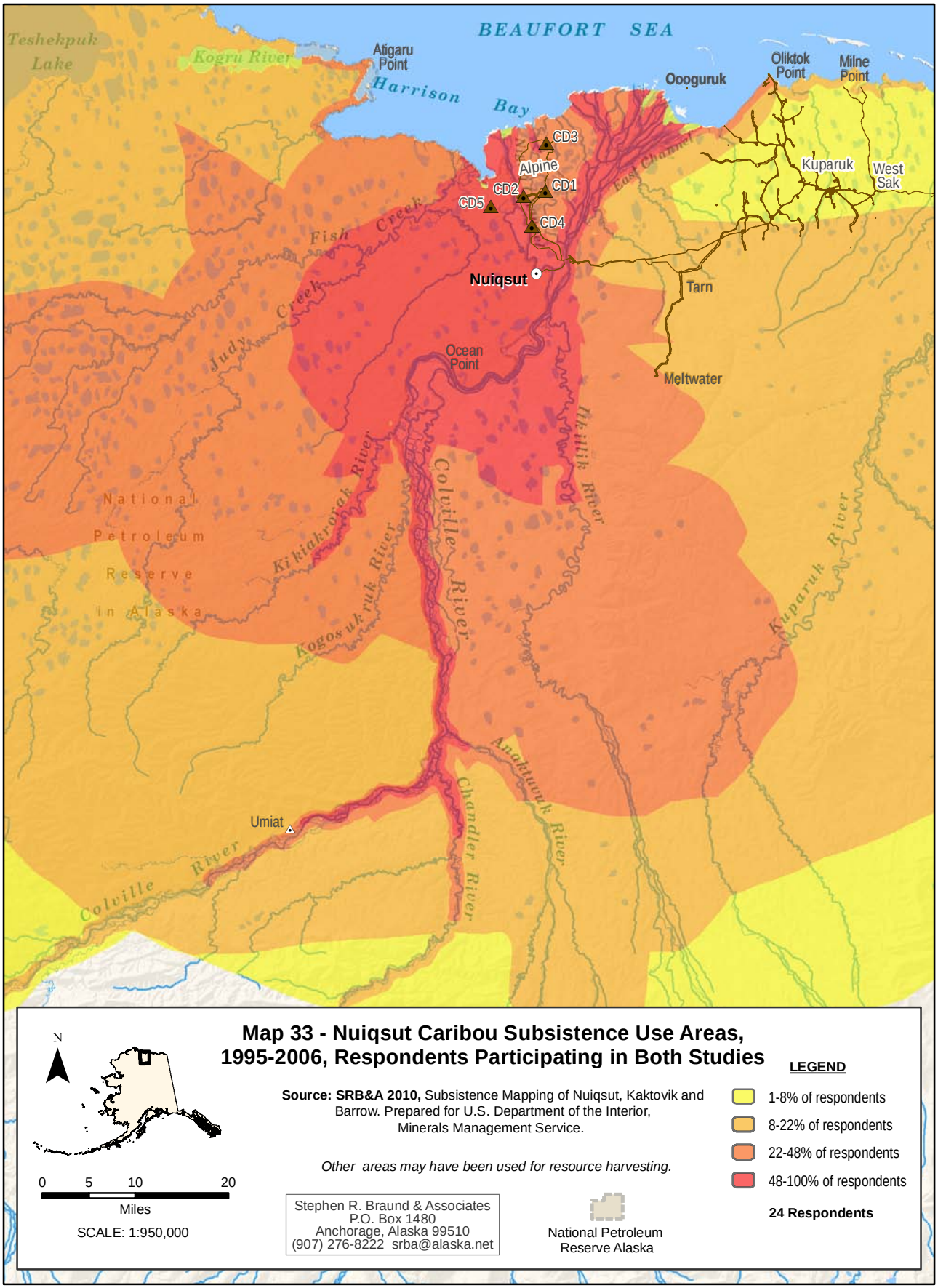
Earlier descriptions of caribou hunting activities by Nuiqsut residents also may inform changes in hunting patterns over time, or in hunter perceptions regarding the availability of caribou. Previous studies by the NSB and ADF&G provide information on subsistence harvests by location. In 1993, Fish Creek was the top harvest location for caribou, with an estimated 111 caribou harvested there, followed by Ocean Point (63 caribou) and Nigliq (53 caribou) (Pedersen et al. 2000). In addition, according to Brower and Hepa (1998), Fish Creek was the top harvest location used by Nuiqsut hunters in 1994-95, followed by Nigliq Channel and the Nuiqsut area. For the 1999-2000 time period (Pedersen Unpublished), Fish Creek provided a much smaller portion of the overall harvest compared to other hunting areas. Instead, Ocean Point, Umiraq, and Nigliq were the top harvest areas. This decreased use of Fish Creek is also evident in the more recent data, both through decreased overlapping use areas and decreased harvests in the area. Other areas that show fewer overlapping use areas in the recent study (i.e., the middle Colville River delta and large overland areas to the west and east of the community) show minimal caribou harvests associated with them during all of the previous studies (Pedersen et al. 2000, Pedersen Unpublished, Brower and Hepa 1998) and therefore no corresponding decrease in harvests is evident.

A 1990 report entitled "Subsistence Resource Harvest Patterns: Nuiqsut" (IAI 1990), which was funded by the Minerals Management Service, describes subsistence harvesting patterns as based on previously existing studies and through fieldwork in the community. Hunter perceptions related to the availability of caribou as described in that report are notably different than those documented in recent years. In the following passage, caribou are described as being readily available to hunters in the vicinity of Nuiqsut:

> *For the hunters of Nuiqsut, caribou are ubiquitous. Caribou are also wanderers and are ultimately unpredictable in terms of knowing exactly where to find them. Given the need to harvest a caribou, however, most Nuiqsut hunters would be fairly confident of being able to do so in a reasonable amount of time.* (IAI 1990)

The report goes on to describe caribou hunting activities in more detail and, again, provides a description that is in stark contrast to more recent accounts. In particular, the following passage notes the high availability of caribou with the Colville River delta and to the west of the community, especially in coastal regions:

> *Caribou are perceived by Nuiqsut residents to be so ubiquitous and readily available that it was difficult for them to indicate areas where they specifically hunted for caribou. They pointed out that one could find caribou in the entire area, that the entire area was used at one time or another, and to point out part of the range over other parts may in fact be misleading…. Most indicated that the coastal areas were the most productive for caribou hunting and that they used boats to access the resource. Although the entire coastal region and Colville River delta was said to be good, the Kogru River area and the upper Harrison Bay regions was pointed out as an especially productive area in the summer. The area around Atigaru Point and below it are also very productive areas, but the water is so shallow there that one must know how to gain access to use this area. Other informants were quite insistent that the*



Map 33 - Nuiqsut Caribou Subsistence Use Areas, 1995-2006, Respondents Participating in Both Studies

Source: SRB&A 2010, Subsistence Mapping of Nuiqsut, Kaktovik and Barrow. Prepared for U.S. Department of the Interior, Minerals Management Service.

Other areas may have been used for resource harvesting.

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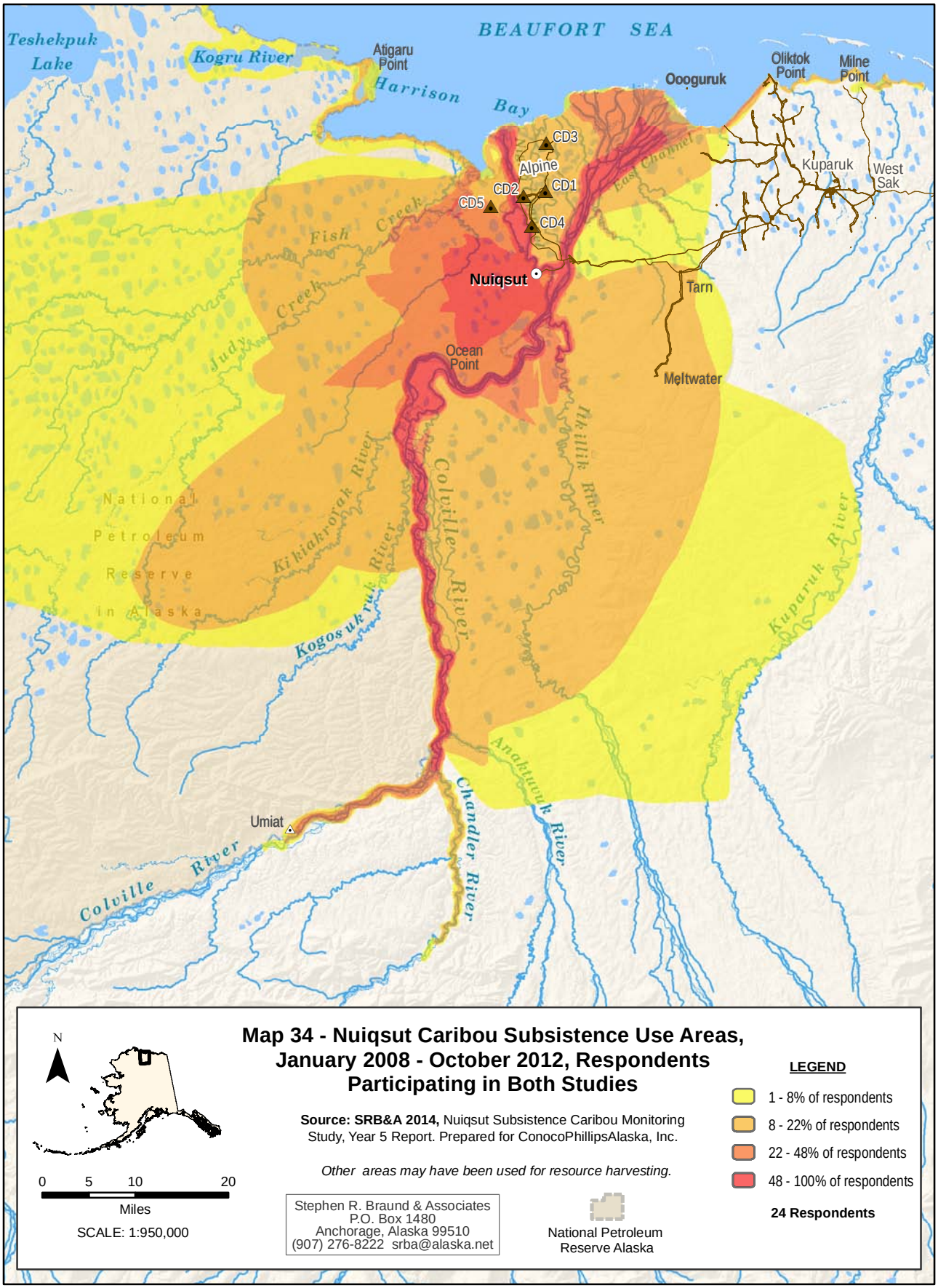
National Petroleum Reserve Alaska

LEGEND

- 1-8% of respondents
- 8-22% of respondents
- 22-48% of respondents
- 48-100% of respondents

24 Respondents



Map 34 - Nuiqsut Caribou Subsistence Use Areas, January 2008 - October 2012, Respondents Participating in Both Studies

Source: SRB&A 2014, Nuiqsut Subsistence Caribou Monitoring Study, Year 5 Report. Prepared for ConocoPhillipsAlaska, Inc.

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LEGEND

- 1 - 8% of respondents
- 8 - 22% of respondents
- 22 - 48% of respondents
- 48 - 100% of respondents

24 Respondents

> *Colville delta and other river systems were vital summer caribou harvest sites as well…. As was true of caribou in the summer, informants say that usually there is no lack of caribou in the winter and there is no real concern about the "best" spot to locate them. They are usually quite near the village. In fact, during fieldwork in February and March, 1990, caribou were observed (and hunted) near the dump, airport, sewage lagoon, and ice road.* (IAI 1990)

Another account of Nuiqsut hunting and harvesting patterns is in Hoffman et al (1988; original distributed in 1978). This document provides a summary of Nuiqsut subsistence activities in the 1970s. Again, caribou hunting is depicted as a reliable subsistence activity which does not require large amounts of time or effort:

> *Hunting for caribou is the bread-and-butter component of the Nuiqsut subsistence complex, although regulations by the Alaska Department of Fish and Game have reduced the harvest of caribou in the past two years. It is possible to hunt caribou with a relatively small cash outlay. Since the founding of Nuiqsut, there have been some caribou in the Fish Creek area each year, throughout the year. This area is only about 12 miles from the village and the cost of traveling there by snowmachine is small. During the summer, caribou are found along both channels of the Colville. Summer caribou hunting trips were usually combined with the checking of gill nets to produce a fairly reliable harvest for the time and money invested.* (Hoffman et al. 1988)

The following general quotes from Year 5 are typical of those provided by caribou hunters in recent years, and illustrate the shift in how hunters perceive caribou availability in the vicinity of Nuiqsut:

> *Back in 80s and 90s... [caribou] used to go right up to village and turn that way and some of them would pass that creek we always go through, and some would pass that and go to Itkillik River and go back out, and not anymore. The closest caribou I ever caught was two and half miles [from the village].* (SRB&A Nuiqsut Interview November 2012)

> *There used to be a lot of caribou. Just a bunch of them. You could even hear them when they run… Yeah, we used to see big herds go through Nigliq in the summer from the west and the east, but they don't do that anymore.* (SRB&A Nuiqsut Interview November 2012)

> *They kind of seemed harder to find this year. When I was younger we used to, we didn't even need to go five miles by four-wheeler but [now] we needed to go way out to catch [them]. Maybe people are hunting all summer and pushing them out. They were pushed further west of town and it was harder to find them. They are almost nowhere to be found.* (SRB&A Nuiqsut Interview November 2012)

> *They're further out. We travel a lot further out for caribou. Probably more [development] companies I guess. They're getting closer every year. [The caribou] started migrating further out.* (SRB&A Nuiqsut Interview November 2012)

> *It just seems like the numbers [of caribou] are declining. They may not be, but to me it seems like I have run into fewer and fewer. Five years ago you could get in the river and go in a boat and pass 20 caribou on the way up. Now, you are lucky to pass one. It used to be you could pick and choose [which caribou you wanted] and now you have to take what you see.* (SRB&A Nuiqsut Interview November 2012)

Previous accounts of caribou hunting activities also indicate a possible shift in the timing of caribou harvests. Both IAI (1990) and Hoffman et al. (1988), stated that June and July were not common caribou hunting periods, noting difficulties with preserving the meat due to the warmer temperatures during those months. IAI (1990) indicated that this was changing due to technology that allowed for more efficient harvests and freezers that allowed residents to preserve foods year-round:

> *June and July also tend to be low activity months for the harvest of caribou, although they are usually locally available. Their condition tends to be poorer than later in the year and the relatively high temperatures makes preserving the meat a problem. More people do take caribou in June and July than in the past, however, perhaps due to larger and faster boats and home freezers. Most of the caribou taken in these months tend to be shot at or near fish camps in the Colville River delta.* (IAI 1990)

Hoffman et al. (1988) notes that August was the prime time for harvesting caribou due to their high quality at that time in addition to cooler temperatures which reduced the chances of spoiled meat. While it is still the case that August is a key time for harvesting caribou (and one that is cited by a number of harvesters as preferable due to the high quality of meat at that time), July is now equally important for the harvests of caribou (Figures 1 and 2). For additional discussion regarding changes in caribou hunting patterns in addition to traditional knowledge of caribou in the Colville River Delta, see Appendix A.

Summary

SRB&A, with the Nuiqsut Caribou Panel, has completed five years of monitoring of impacts of CD4 and other CPAI satellite developments on Nuiqsut residents' caribou hunting activities. The monitoring data are based on interviews with a sample of active Nuiqsut caribou harvesters as well as household harvest surveys. Fifty-eight respondents were interviewed in Year 5 (including 57 active harvesters), compared with 59 in Year 4 (including 58 active harvesters), 60 in Year 3 (including 57 active harvesters), 54 in Year 2 (including 53 active harvesters) and 40 in Year 1 (including 37 active harvesters). Elder interviews occurred during each of the five study years.

Fifty-seven active harvester respondents reported 211 caribou use areas for the Year 5 time period (November 2011 to October 2012). They also identified 200 successful harvest locations, compared to 182 in Year 1 (reported by 34 harvesters), 160 in Year 2 (reported by 52 harvesters), 199 in Year 3 (reported by 55 harvesters), and 166 in Year 4 (reported by 55 harvesters). In Year 5 the research team also conducted a household harvest survey yielding an estimate of 501 caribou harvested by all Nuiqsut households in a twelve month period from January to December 2012 compared to the 437 caribou harvested by all Nuiqsut households in Year 4. The average pounds harvested per household in the 2012 survey (598 pounds) is higher than that estimated for Year 4 (544 pounds) but within the range of harvest estimates made over the 14 available study years, and somewhat higher than the average of all study years. Harvests over the last decade are lower than estimates made in 1993 (903 mean pounds per household) and 1985 (790 mean pounds per household) (Table 18). The gap between the percentage of households attempting to harvest caribou and those households successfully harvesting caribou was highest in 2010 (Year 3) (10 percent gap) and 2011 (Year 4) (14 percent gap) compared to all other available study years, indicating decreased rates of success for local hunters. This gap was lower in 2012 (six percent gap).

Hunters provided observations on their caribou use areas, harvest locations, and harvest characteristics. In addition, hunters reported on their observations of changes in harvests and caribou, impacts on hunting activities, and assessments of mitigation actions. Comparison of previous use area data to the use areas collected for the Nuiqsut Subsistence Caribou Monitoring Project indicate decreased use of the middle Colville River Delta in addition to Fish Creek and in some overland areas to the southwest and southeast of the community. The area west of Nuiqsut provided the greatest percentage of reported harvests in Year 5 (34 percent), followed by East Channel Colville (20 percent), and Nigliq Channel (15 percent). Over the five study years, the percentage of harvests coming from Nigliq Channel decreased steadily from 23 percent to 15 percent. The percentage of harvests along the East Channel rose substantially from 10 percent in Year 4 to 20 percent in Year 5. The percentage of respondents reporting at least one successful hunting area was similar in Year 5 compared to previous years; however, the percentage of successful hunting areas was higher in Year 5 compared to Years 2 through 4. In Year 5, a higher percentage of harvest locations (62 percent) were associated with the harvest of a single caribou (rather than more than one caribou) compared to previous study years (between 36 and 52 percent).

Year 5 results show similar percentages of respondents reporting a change in their hunting areas, trip frequency, trip duration, or hunting months compared to the previous year. Year 5 shows the lowest percentage of respondents who reported a change in their harvest amount compared to the previous year, at 54 percent of respondents compared to between 68 percent and 85 percent in all previous study years. Year 5 results show an increase in the percentage of respondents reporting that they did not harvest enough

caribou, after a decline in Year 3 and 4. Forty-one percent of Year 5 respondents reported not harvesting enough caribou for their households compared to 16 percent in Year 4, and 21 percent in Year 3.

The percent of harvesters observing caribou with abnormalities declined over the first four study years from 64 percent in Year 1 to 29 percent in Year 4. However, this increased in Year 5 to the highest percentage of respondents (45 percent) since Year 1 (64 percent). The number of caribou with one or more reported abnormalities was also higher in Year 5 than in Years 2 through 4. This increase was also observed during the household caribou harvest surveys, with 40 reports of sick caribou in Year 5 and 23 in Year 4. The two principle types of abnormalities observed are "size" and "health." "Decrease in resource size" was the most common abnormality observation during all three study years, followed "disease/infection".

Forty-eight percent of harvesters in Year 5 reported one or more Alpine impacts on caribou hunting, an increase from Year 4 (31 percent) but a decrease from Year 1-3. As in the case of Years 1 through 5, the most commonly reported impact was associated with helicopter traffic, with 30 percent of harvesters reporting helicopter traffic impacts during the Year 5 study period. These observations accounted for more than half (55 percent) of all impact observations in Year 5. There has been a marked decrease in reports of impacts of planes within the area, with 11 percent and nine percent of respondents reporting impacts in Years 5 and 4, respectively, compared to Year 3 (19 percent), Year 2 (38 percent), and Year 1 (53 percent). Reports of impacts from man-made structures declined in Years 3 and 4 (nine percent and five percent), with a slight increase in Year 5 (13 percent).

In addition to Alpine-related impacts, Nuiqsut harvesters have increasingly reported impacts from other (non-Alpine) sources as exploration, development, and research have increased within the region. In Year 5, over half of active harvester respondents (55 percent compared to between five percent and 31 percent in previous study years) reported impacts from non-Alpine sources. The majority of these impacts were related to helicopter and plane traffic.

REFERENCES

AECOM. 2011. Transcript of the Foothills West Transportation Access EIS Scoping Meeting held at the Nuiqsut Community Center on June 13, 2011. Transcribed by Liz D'Amour & Associates, Fairbanks, AK

Alaska Department of Fish and Game. 2011. Community Subsistence Information System. Available online at http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADFG=main.home. Accessed November 2011.

Alaska Native Science Commission (ANSC). 2009. The Voice of the Real People: North Slope Communities on NPR-A Social Science Plan. Prepared by Alaska Native Science Commission for the Bureau of Land Management, September 2009.

Arthur, S. M., and P. A. Del Vecchio. 2009. Effects of oil field development on calf production and survival in the Central Arctic Herd. Final research technical report, Federal Aid in Wildlife Restoration Project 3.46. Alaska Department of Fish and Game, Juneau. 36 pp.

Bacon, J., T. Hepa, H. Brower, Jr., M. Pederson, T. Olemaun, J. George, and B. Corrigan. 2009. Estimates Of Subsistence Harvest For Villages On The North Slope Of Alaska, 1994-2003. North Slope Borough, Department of Wildlife Management, Barrow, Alaska.

Braem, N., S. Pedersen, J. Simon, D. Koster, T. Kaleak, P. Leavitt, J. Patkotak, and P. Neakok. 2011. Monitoring of Annual Caribou Harvests in the National Petroleum Reserve in Alaska: Atqasuk, Barrow, and Nuiqsut, 2003–2007. ADF&G, Division of Subsistence, Technical Paper No. 361.

Braund, Stephen R. & Associates (SRB&A). 2013. Nuiqsut Caribou Subsistence Monitoring Project: Results of Year 4 Hunter Interviews and Household Harvest Surveys. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska.

_____ 2012. Nuiqsut Caribou Subsistence Monitoring Project: Results of Year 3 Hunter Interviews and Household Harvest Surveys. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska.

_____ 2011. Nuiqsut Caribou Subsistence Monitoring Project: Results of Year 2 Hunter Interviews. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska.

_____ 2010a. Nuiqsut Caribou Subsistence Monitoring Project: Results of 2009 Hunter Interviews. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska.

_____ 2010b. Subsistence Mapping of Nuiqsut, Kaktovik, and Barrow. Funded by the U.S. Department of the Interior, Minerals Management Service. Alaska OCS Region, Environmental Studies Program. Contract No. 1435-01-02-CT85123.

_____ 2009 Impacts and Benefits of Oil and Gas Development to Barrow, Nuiqsut, Wainwright, and Atqasuk Harvesters. Prepared for the North Slope Borough, Department of Wildlife Management, Barrow, Alaska.

Brower, H. Jr., and R. Hepa. 1998. North Slope Borough Subsistence Documentation Project: Data for Nuiqsut, Alaska for the Period July 1, 1994 to June 30, 1995. North Slope Borough, Department of Wildlife Management. Barrow, Alaska.

Fall, J.A., and C.J. Utermohle. Unpublished. An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska. Harvest data collected by ADF&G, Division of Subsistence. Prepared for U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region, OCS Study MMS 95-012.

Fuller, A. and J. George. 1999. Evaluation of Subsistence Harvest Data from the North Slope Borough 1993 Census for Eight North Slope Villages: For the Calendar Year 1992. North Slope Borough, Department of Wildlife Management, Barrow, Alaska.

Greist, L. 1978. Puiguitkaat: The 1978 Elder's Conference. Transcription and translation by Kisautuq (Leona Okakuk), photographs by Gary Kean. North Slope Borough Commission on History and Culture, Barrow, Alaska.

Hoffman, D., D. Libbey, and G. Spearman. 1988. Nuiqsut: Land Use Values Over Time in the Nuiqsut Area. North Slope Borough and the Anthropology and Historic Preservation Section of the Cooperative Park Studies Unit, Occasional Paper No. 12, University of Alaska Fairbanks.

Impact Assessment, Inc. 1990. Subsistence Resource Harvest Patterns: Nuiqsut. John S. Petterson principal investigator and project manager. U.S. Department of the Interior, Bureau of Land Management, Alaska Outer Continental Shelf Office, Alaska OCS Socioeconomic Studies Program Special Report No. 8. (MMS 90-0038)

Kakinya, E. 1978. Puiguitkaat: The 1978 Elder's Conference. Transcription and translation by Kisautuq (Leona Okakuk), photographs by Gary Kean. North Slope Borough Commission on History and Culture, Barrow, Alaska.

North Slope Borough. 2010. North Slope Borough 2010 Economic Profile and Census Report. Prepared by C.E. Shepro, D.C. Maas, and D.G. Callaway (Circumpolar Research Associates) with J. McAnich. Project Manager J. Bergerson. NSB oil and Gas Analyst. North Slope Borough Department of Administration and Finance. Barrow, AK.

Pedersen, S. 2008. Monitoring of Annual Caribou Harvests in Three Communities (Atqasuk, Barrow, and Nuiqsut) within the National Petroleum Reserve-Alaska: 2002-2007. Alaska Department ofo Fish and Game, Division of Subsistence, and Bureau of Land Management – Alaska, Northern Field Office, in cooperation with the Iñupiat Community of the Arctic Slope.

_____ Unpublished. Nuiqsut caribou harvest data provided by Sverre Pedersen. Alaska Department of Fish and Game.

Pedersen, E., R. Wolfe, C. Scott, and R. Caulfield. 2000. Subsistence Economies and Oil Development: Case Studies from Nuiqsut and Kaktovik, Alaska. Part 1. In :Subsistence Economies and Oil Development: Case Studies from Nuiqsut and Kaktovik, Alaska, edited by S. Pederson, R. Wolfe, C. Scott, and R. Caulfield and Part 2: Subsistence Harvest Variability in Alaska Native Communities by R. Wolfe, C. Scott, S. Pedersen, and R. Caulfield. Prepared by the ADF&G, Division of Subsistence and the University of Alaska, Fairbanks, Department of Alaska Native and Rural Development. Prepared for U.S. Department of the Interior, Minerals Management Service, Alaska OCS Region, Contract MMS 14-35-001-300661.

U.S. Army Engineer District (USAED), Alaska. 1996. Official Transcript, Proceedings of Public Hearing, Draft Environmental Impact Statement for the Proposed Beaufort Sea Oil and Gas Development, Northstar EIS Project, Public Scoping Meeting, Nuiqsut, Alaska, May 7, 1996: Anchorage AK, Alaska Stenotype Reporters.

U.S. Census Bureau. 2011. 2010 Census Tables. Available online at http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed on April 2011.

U.S. Department of the Interior Bureau of Land Management. 1998. Official Transcript, Proceedings of Public Hearing, National Petroleum Reserve-Alaska, NE NPR-A PDEIS, Nuiqsut, Alaska, January 14, 1998: Anchorage, AK, Computer Matrix.

_____ 2003. Alpine Satellite Development Plan Scoping Meeting, Nuiqsut, Alaska, March 18, 2003. Anchorage AK; Liz D'Amour and Associates.

U.S. Department of the Interior, Minerals Management Service (USDOI, MMS) 1979. Official Transcript, Proceeding of Public Hearing, Draft Environmental Impact Statement for the Proposed Oil and Gas Lease Sale BF in the Beaufort Sea, Nuiqsut, Alaska, June 4, 1979: Anchorage AK, Alaska-Wide Court Reporters.

_____ 1990. Official Transcript, Proceedings of Public Hearing, Draft Environmental Impact Statement for the Proposed Oil and Gas Lease Sale 124 in the Beaufort Sea, Nuiqsut, Alaska, April 19, 1990: Anchorage, AK.

APPENDIX A: TRADITIONAL KNOWLEDGE OF CARIBOU IN THE COLVILLE RIVER DELTA

Although the purpose of the Nuiqsut Caribou Subsistence Monitoring Project is to monitor changes in and impacts on caribou subsistence hunting activities related to the Alpine satellite development, it is helpful to view current trends in the context of historic and long-term trends. This appendix provides a preliminary summary of Nuiqsut traditional knowledge about caribou, particularly as it relates to the Colville River Delta, and caribou hunting activities over time. This summary is based on interviews with Nuiqsut elders conducted by SRB&A during the first year of the Nuiqsut Caribou Subsistence Monitoring Project (SRB&A 2010), in addition to a review of traditional knowledge in existing literature and a review of historic descriptions of caribou hunting activities by Nuiqsut residents. Although the current community of Nuiqsut was formed in 1973, many elders living today were born in or lived in the Nuiqsut region (including Nigliq Channel, Oliktok Point, and Foggy Island) prior to the 1970s resettlement, and thus have long-term knowledge of the environment, climate, land, and animals in the area, including traditional knowledge passed on to them by their elders. Statements from elders who had lived in the Colville River Delta before the establishment of the present-day community of Nuiqsut can provide a glimpse of caribou migratory patterns as well as Iñupiaq harvesting patterns prior to oil and gas development in the region.

General Caribou Migratory Patterns

During a 1978 elder's conference, Elijah Kakinya described the general patterns of caribou in Colville River region and noted that, according to oral history, these patterns had remained consistent over time. His description is similar to more recent descriptions of the typical migratory patterns of caribou, in that the caribou tend to congregate along the coast during the summer and travel inland during the late fall and early winter:

> *See here, these caribou, after being along here toward the ocean during the summer, when it is starting to almost become winter they always head up to the trees going by way of us. Up towards inland. And then, even so, after being up there all during the winter, again toward here, after wintering up there they would head toward the ocean to go fawn. It is said ever since that time long ago, way before our time, when there must have been some people [in the area], they would act always in this manner, thus. From since that time long ago they are ones who act in this manner…. Going by way of our place, via Killiq [River]. Through over farther more that way, and over through the other side of Killiq [River], through Killiq, through south of there, through us, through Ulu and through Narvavak. Up in that certain area we see that they had that route ever since that time long ago. Being that way since that time long ago.* (Kakinya 1978)

During SRB&A interviews in 2009, several elders identified and described the locations of past and present caribou migration routes. Although they stressed that the routes they identified were not exact and that the caribou migration varies from year to year, the elders noted some general patterns in the movement of caribou. According to their descriptions, the Teshekpuk herd migrates along the coast west of Nuiqsut during the summer and fall months, arriving west of the community and then heading south along the Colville River toward the Brooks Range. The Central caribou herd arrives from the east around the same time. In September and October, some caribou from the west (Teshekpuk Herd) and east (Central and Porcupine herds) mingle in an area west of the community toward Fish Creek and Ocean Point before heading south for the winter. Some caribou remain in the area all winter long.

Nuiqsut Harvesting Areas and Hunting Patterns

The use of the Colville River Delta by the Iñupiat is evident in the various historic and prehistoric archaeological sites found in the area. Many of these sites contain the remnants of caribou hunting and harvesting activities (Hoffman et al., 1988). One elder provided a detailed description of the various traditional uses and preparations of caribou for food, clothing, shelter, and art. She noted that caribou was, and is, a primary subsistence resource for Nuiqsut people, saying, "Everything was caribou. That was their main thing, the caribou was their clothing…caribou, seal, bearded seal, and polar bear skin, caribou blanket" (SRB&A Nuiqsut Interview March 2009). She went on to describe, in further detail, the many traditional uses of caribou:

> *We use them for the tent outside, to make it warm. And we use them for mattress. Clothing, the legs, mukluks, and make a mitten. Take their skin and put it water, to make skin masks. They take all the skin off. You could use it for when you make mukluks. [Tendons] for the string for the mukluks. The caribou is used everything for parka, for winter, make Eskimo coveralls…. We are ready to get the fur for the parka after August 15. Those we get in August, they are fat, we make ice cream. Agutuq. We always eat everything…bone, we cut up for the stew, we don't throw them [away]. When a caribou is no good, we checking on its liver. We like those bugs [found in caribou], we eat them when they are moving, when we were small. Then we boil them. When they getting big, it's good. You could boil them and eat them. We eat anything, even stomach. We eat that. We use that [stomach] for the vegetables. They ate that thing first, in the winter time they cover the caribou and cut it up and the stomach they save it and eat all of them [stored vegetation in the caribou stomach to eat during the winter]. That was long time ago when there were no stores. We don't throw anything [away], bone we cut up and the dogs will eat the bone. Even the feet, we cut them right here and put them in summertime in the pond. Keep them there for a while and after they age they eat them. They put it in a pond for two months and then we eat the feet.* (SRB&A Nuiqsut Interview March 2009)

During SRB&A's interviews, several elders described hunting caribou while growing up in the region near the current site of Nuiqsut on Nigliq Channel. They also discussed their hunting activities since Nuiqsut was resettled in 1973. Respondents most commonly described hunting caribou along the Nigliq Channel and indicated that caribou regularly and predictably migrated through the Colville River delta during the summer months. Describing past caribou hunting, one elder said, "Everywhere is caribou; they're not bothered" (SRB&A Nuiqsut Interview March 2009). However, she went on to describe recent changes to their traditional hunting area along Nigliq Channel:

> *Right now it is hard to get caribou here. They going to up there, the mountains. [Translator] When they first come [to Nuiqsut], they were all over this area, they roam over there by the village. Nowadays they hardly in this area because of the pipelines. Hardly catch any caribou in this area. The pipeline has diverted the caribou.* (SRB&A Nuiqsut Interview March 2009)

Another elder observed,

> *Just in here, hunt mostly in that area [Nigliq Channel] before. Up and down there. Yeah, they have to go farther [now], only place to go. They'd be all around here briefly, but when [the caribou] moved, [the hunters] had to change, because they had to go Fish Creek and along this area to hunt now, on the west side, along the coastline or up in the Fish Creek area.* (SRB&A Nuiqsut Interview March 2009)

> *That's where we used to go [hunting], from Nigliq. Used to have* tuttus *hang around there, where Alpine is. We used to hunt* tuttu *where the Alpine is.* (SRB&A Nuiqsut Interview March 2009)

The timing of the caribou hunt, as described by elders, was similar to the present day. One elder recalled that they usually harvested one caribou in June, but preferred to harvest the majority of their caribou in August, when they were fat:

> *We don't hunt caribou until…. We gotta get one in June. We gotta wait until August, they are skinny [before August]. Before they come in July, take one caribou. In August, we go hunting for winter. Sometimes we get five caribou, cut them, put them away…. Those days they didn't have no fridge, nothing. Had to take it to the ground level, permafrost and store them down there in ice cellars. We hunt in August and September only. But there's October, we don't hunt those. They try to get as much as they can before rutting season.* (SRB&A Nuiqsut Interview March 2009)

According to historic accounts, inhabitants of the Colville River tended to follow the caribou migration; staying in settlements near the coast during the summer and traveling inland during the winter. During times of resource scarcity, such as in the late 19th century when the caribou were depleted, families may have traveled to alternate hunting grounds; however, the Colville River remained an important area which residents returned to time and time again. During a 1978 elders' conference, Levi Greist, whose ancestors

came from the Nuiqsut area, noted that his ancestors had at one point moved away from the Colville River due to a lack of caribou, only to return to the area at a later time:

> *They had gone to Saġvaġniqtuuq [Sagavanirktok River], we learned, because that Colville River did not have much caribou and they followed along to a place which had some caribou. They would return, though, to that area over here, my relatives, including both my grandparents.* (Greist 1978)

Greist went on to describe how the Iñupiat at Nigliq would travel to the mouth of Itkillik River (referred to as *Killiq*) by boat just before freeze-up. From there, they would travel inland following the caribou by dogteam:

> *And then when they are ready there at Niġliq those Eskimos there, hoping to cut the distance which they would have to travel by dogteam, would quickly proceed to go upriver to that certain place up there which is their usual stopping place, Killiq-Killiq, it is said- and it is there that we would await winter. And then as soon as it freezes we would go up along through Killiq up to the mountains. At that time long ago there would be no caribou there, there were no caribou there. Although it would have a few caribou, those which would cross up and over the hills wherever. Although one could find some once in a while. But the sheep which are on the mountains would never leave. They would always be there in their usual habitat all the time.* (Greist 1978)

A historical account of the seasonal activities of people living in the Colville River delta was provided by William Irving (1953) and reproduced in Hoffman et al. (1988). His account, in addition to elder accounts of historic hunting activities, indicate that the Colville River delta was most heavily used by the Iñupiat during the late spring and summer months when caribou were most available in that area. The late fall and winter months were more frequently spent traveling inland to winter hunting grounds. Irving described,

> *…the people of the lower river would begin seal hunting in May, more than a month before the visitors from the mountains arrived at Neklek [Nigliq] in the delta and finished their trading with people from Barrow. They would customarily spend the fall and winter at fishing sites and make regular excursions into the tributary valleys on the west side of the Colville to look for caribou if these were not abundant near camp. Seals were not hunted in the winter as a rule, and were probably not as important in the diet as caribou and fish.* (Irving 1953 as cited in Hoffman et al. 1988)

Changes in Caribou Over Time

During public hearings in the late 1970s and early 1980s, Nuiqsut elders were already beginning to observe changes in caribou, which they believed were a direct result of oil and gas development. During a scoping meeting related to oil and gas leases in the Beaufort Sea, Sarah Kunaknana stressed the importance of the coastal areas to various wildlife species including caribou. She observed that "the caribou are abundant in the summertime on the shoreline" (Sarah Kunaknana, USDOI, MMS 1979). Through an interpreter, Nannie Woods, also of Nuiqsut, noted a general decline in the availability of caribou compared to the past:

> *There were lots of caribou that we hardly see anymore…But she thinks that she hardly see caribou anymore. Life is getting hard and she can barely…she is one of the elders, elders here at Nuiqsut.* (Nanny Woods, USDOI, MMS 1979)

Starting in the 1990s, Nuiqsut residents continued to express concerns about changes to caribou during public hearings related to the National Petroleum Reserve – Alaska. They stressed, over and over again, the importance of the Colville River delta and surrounding areas to caribou. Residents generally indicated that caribou were readily available near Nuiqsut, but expressed concern that this may change if oil and gas development continued its westward expansion toward Nuiqsut:

> *Lot of caribous, but very seldom we get the Porcupine [caribou]. If they do come in they'll get all the way up here if we have southwesterly wind blowing steadily for a week and hot. Lot of mosquitos. They'll come, otherwise they will stop up there by Canning, not Canning but Sagavanirktok, and then move back east.* (Thomas Napageak, USACE 1996)

Last spring we were fortunate to have caribou in our region as well as this fall. And they've been seeing caribou in the area north of us and I think it has been mainly due to less activity by these people here. I doubt that they would have been seen if these people had come around doing their activity. I think that once they start up again, our caribou are going to go elsewhere because they will see them. The residents of Nuiqsut hunt seasonally when the time comes that certain game are perfect to catch and not all the time. (Ruth Nukapigak; USDOI, BLM 1998)

In Nuiqsut, the effect of subsistence harvest patterns will be very high because not only will the bowhead whale always be reduced or eliminated by construction activities, but the caribou hunt will be reduced as well by construction activities and the pipelines. (Thomas Napageak; USDOI, MMS 1990)

Like last summer, there was a herd of caribous coming out from the east and they were crossing the Nerluk [Nigliq] Channel, and some people were killing some caribous. (Joe Kasak; USDOI, MMS 1990)

Ever since we moved here our people have given testimonies and I know about there being a lot of them. I don't speak up very often but at this time I want to talk about this area that used to have caribou in the winter when we lived in Barrow. When the caribou was in short supply we would travel to Tasiqpak [Teshekpuk] knowing that we would find caribou and to the area close to Kuuguluk [Kogru River?]. Before we moved back to Nuiqsut I used to also do my hunting at Umiat. That area [NPR-A] is a prime hunting ground and if they could choose other sites [to develop], that would be fine by me. It is a very prime hunting area. (Archie Ahkiviana; USDOI, BLM 1998)

Public hearings in Nuiqsut related to the Alpine Satellites Development in the early 2000s show an increasing concern among Nuiqsut residents related to the impacts of the Alpine and Meltwater developments in addition to potential impacts from development of Alpine Satellites. Elder Sarah Kunaknana described changes that had already occurred within the region, saying,

Much of the development nearby already has altered migratory paths of the wildlife, caribou for example, they don't migrate in the areas traditionally. That change is significant. And for that reason, she would like the Alpine site as a good measuring tape for this because their migrations are altered and these have--the migrations have changed and right now they are in a dilemma of oil and subsistence resources that are utilized. (Sarah Kunaknana; USDOI, BLM 2004)

During the hearings, residents noted that the proposed placement of Alpine Satellites infrastructure was in the pathway of traditional caribou migratory routes:

And CD-5 is an area where caribou migrate on the coastal plain during summer. If we go that route and CD-5 and the bridge is down there, we will have the same problem we did in the Prudhoe Bay and the Kuparuk area with our caribou. (Frank Long, Jr.; USDOI, BLM 2003)

...around where you guys are planning to propose in putting your guys' infrastructures (Alpine) and stuff like that, that is one of the main caribou crossings on the Colville River delta. (Isaac Kaigelak; USDOI, BLM 2003)

In more recent years, Nuiqsut elders have expressed the belief that the Central Herd migration has changed due to interference from pipelines, and they pointed out several areas on the Colville River delta, including a place called *Pisiktaġvik*, where they used to cross. The elder respondents commented that the shine from the pipelines deflects caribou, and suggested that the oil companies should dull or paint the surface of the pipelines to mitigate this impact. As one individual described, "The pipeline is so shiny that they come to it and start to cross it, the glare in that pipeline took the caribou away from migration" (SRB&A Nuiqsut Interview March 2009). The elders provided the following descriptions of caribou migrations and impacts on caribou migrations:

He knows that Teshekpuk has never changed much, they still go on the migration of their past. Central Herd is same general area, but changed slightly, because low water happened and some pipeline in

Meltwater. Can't come across it, and that's why it's up, caribou can't cross to the other side. They go around the pipeline. Some of them [pipelines] are real low. Make sure they are seven feet [tall]. The older ones are those ones deflecting the caribou [new pipes are better, taller]. (SRB&A Nuiqsut Interview March 2009)

I never seen a real lot of caribou. Back then we used to have a lot. There'd be a lot more caribou in this area than compared to the west, Teshekpuk Herd. When they'd migrate there'd be more. In the 50s there's lots of caribou used to cross right down there, in the summer time. Never do that anymore, hardly. They start CD3 and Alpine, but that Tamayayak River used to have lots and lots of caribou but hardly any more. CD3, the people told Alpine, there's hardly any here. There used to be a lot of caribou that migrate right here, they don't do that anymore [by the coast]. (SRB&A Nuiqsut Interview March 2009)

When the caribou from the Central come through here they go this way, but after they start build pipeline they stopped going to this area. Pisiktaġvik, this whole sandbar, this whole island. But now with pipelines they don't come there no more. There used to be a lot of caribou on the west side, following the coast lines. Went right along here by Nanuk, CD4, used to go through there all the time but not now. It changed their migration. We were in Fish Creek, making fish and tuttu try to take for winter and then they start coming in August from Teshekpuk. Going to… Heading up north from there. To the mountains. Pretty soon they gonna come, maybe next month. May, June, they start heading back up. The start heading from the mountains. They start coming in May, June, July. They used to cross there. (SRB&A Nuiqsut Interview March 2009)

Teshekpuk go up this way. This side of the Colville. The Central Herd go back [along Itkillik River]. And start migrating up to the mountains from this area. September, October. In the spring time they [Central Herd] always go down [toward Nuiqsut]. (SRB&A Nuiqsut Interview March 2009)

Yeah, they still come through here on this area [west]. This side of the channel. And they cross straight down to the ocean. Porcupine Herd and Teshekpuk Herd come together in this area and mingle, then go their separate ways. (SRB&A Nuiqsut Interview March 2009)

As indicated above, these respondents also mentioned that the Porcupine Herd used to travel to the area from the east, but observed that their migration routes have changed in recent years due to diversion from pipelines:

The Porcupine Herd that comes from Canada through here, when the pipeline, when it went all the way to the Meltwater, when they build that pipeline to Alpine, they stopped seeing them. Oliktok, to Meltwater. (SRB&A Nuiqsut Interview March 2009)

One elder expressed concern that the pipelines east of the community have affected caribou calving areas, indicating that some caribou no longer travel to the Teshekpuk area to calve, as they traditionally have. He went on to describe the effects of pipelines on caribou migration from the east and access to insect relief areas on the coast:

There's a lot of changes. There's too much pipeline on that other side [east]. They're starting to have their young on that side. Usually had them down toward Teshekpuk. Yeah, over here on this side, cause of this pipeline they couldn't go. I seen quite a few in that area…. They been impacted by the oil companies, yes, true…. No caribou from the east. You gotta keep telling them there's no caribou from the east in Nuiqsut anymore. When me and my buddies used to catch them, the ones from the east and west joined together and come up. They meet and start going up. By Nechelik, right close and they start going up. Yeah, quite a few [come from west]. In the mosquito harassment area here [on the coast east of Colville], they got closed out by the pipeline. They should put an easement, about a half mile, to let them cross. I seen some turned back, about 100, back by that pipeline from Meltwater. They stay by Prudhoe nowadays. That Meltwater pipeline. When they first put this pipeline, the shine from that, they seen it and started running around back. (SRB&A Nuiqsut Interview March 2009)

This elder also commented that the pipelines cause the caribou to stop and scatter, rather than continuing on their migratory route and remaining as one herd. He described,

> *Once they get corralled by the pipeline they just stay there. They go some place, I don't know where. They don't bunch, they scattered all over. That's what they need, an easement along the coast. Sometimes they come through [to the west]. But that pipeline, I see quite a few turn. Maybe they go around it nowadays or not. And the flash from that pipeline, that galvanized thing, will turn them back, too. Put a dull finish on it.* (SRB&A Nuiqsut Interview March 2009)

During a study by the Alaska Native Science Commission (ANSC) related to NPR-A development, elder Annie Lampe discussed her observations about the impacts of pipelines on the availability of caribou in traditional hunting areas, noting that residents no longer harvest as many caribou directly along the Nigliq Channel:

> *There's a pipeline. We always get the caribou, up there, down there, that way. Now we have to go that way [west] to go get caribou. Because the structures we have to go the other direction to harvest. Got to go through out to the ocean and then go get caribou way over there. Much longer routes than usual.* (Annie Lampe; ANSC 2009)

During the same study, another Nuiqsut resident discussed changes in caribou hunting patterns, due to avoidance of oil and gas infrastructure. This individual noted that some hunters no longer travel to traditional hunting areas because of the presence of oil and gas activity, even if the caribou are available in those areas:

> *And then you kind of prepare where you're going to go hunt. In the old days you go where the animals went. Now you have to [go] where you won't be disturbed or you won't feel like you will disturb someone else in their work, vice versa. So you go to an area. I won't see any oil rigs out in Nuiqsut. I won't see airplanes going over me. Hopefully, I'll see a caribou. It's not as good as out north where all the rigs are. It's a lot calmer and peaceful to go out where there are no activities. A lot of us hunters are going south more and more than we used to.* (Unknown Respondent; ANSC 2009)

In addition to impacts from pipelines, elder respondents described experiencing or observing impacts related to traffic, such as helicopter, plane, and boat traffic. They indicated that the noise from traffic causes the caribou to act skittish or "spooked."

> *Plenty [of traffic]. Especially those boats with loud noise. Go through my allotment every summer. Really loud, you can hear them from a distance. Airplane, helicopter fly everyday. Even small planes, sometimes. Summer, in summer, mostly always fly. They always go through towards Fish Creek, land by my allotment, helicopters down there. Every summer, in July, June. I never see much in August, I always go up river moose hunting. They got three of them [airboats]. They can go through the shallow water. Lots of noise. Some of them get spooky. That noise is no good for an animal. Yeah, when some of the caribou get spooked, they run off. When they get spooked they just start running away.* (SRB&A Nuiqsut Interview March 2009)

> *We stay in Fish Creek for the month, preparing food for winter. Little plane was back and forth. We try to go get that tuttu, we can't, there's a plane right there.* (SRB&A Nuiqsut Interview March 2009)

> *I heard they are always counting the caribou through helicopters. One time before Alpine had happened, they did a lot of caribou stuff by "Piniqtuk" and they noticed they used chopper and planes to scoot them away from the area where they planned to build Alpine. Then they say helicopters don't interfere with the migration. I think they always be together when they start coming in, the main herd that stay together. Then one lone caribou [makes it near Nuiqsut]. We always wait long time for caribou. Then July we're hungry because we got one in June, waiting for August. How we gonna get the meat from the store, it's expensive? $16 a steak.* (SRB&A Nuiqsut Interview March 2009)

As recently as 2011, elder Marjorie Ahnupkana provided observations at a public hearing regarding the drastic changes she had observed over her lifetime. In two different statements, she noted a general decrease in large herds of caribou near Nuiqsut:

> *You don't see caribous like three to five thousand at a time coming this way. She have seen more than that in her lifetime, and none of those come through here anymore. They are being dispersed before they get to Colville.* (Marjorie Ahnupkana; AECOM 2011)

> *Again, the caribou from the east side has been diverted because of tremendous drill sites; a lot of pipelines crisscross. Our caribou from the east don't come directly through Nuiqsut. They're 15, 20 miles south of here, meaning we have to travel that (much) further to harvest our caribou at some point. If the caribou are left alone by the industries, they will migrate right around through their migration path. But if they are being harassed, they're going to go further south, meaning we have to travel further south towards Umiat to subsist. And they say (that this is) the first time that that has happened to this village.* (Marjorie Ahnupukana; AECOM 2011)

Elders have also commented on changes in the health and quality of caribou in recent years. Elders have observed that the caribou are fat or skinny often depending on where they are located. Caribou from the Porcupine Herd, for example, are skinny after traveling such long distances. The amount of fat on the caribou also depends on the timing of the year. Two elders described,

> *The ones from Porcupine Herd travel a long distance. They travel constantly, compared to the ones that stay around here. They get more fatter here, compared to that Porcupine Herd that has to travel further.* (SRB&A Nuiqsut Interview March 2009)

> *The Teshekpuk Herd that went over there would always be skinnier. But the ones from up river where there's less snow would be fatter [not as much digging]. There's caribou feeding in the high plains, Ocean Point area.* (SRB&A Nuiqsut Interview March 2009)

One elder observed that the caribou have been getting fat later in the summer, saying, "In the old days, they got fat in July. They are late to get fat these days." He indicated that the fat is approximately two inches thick in July, whereas it used to be approximately four inches thick. During a meeting with the Nuiqsut Caribou Panel in Year 5, an elder discussed changes in the fat content of caribou and believed these changes were due to warming trends:

> *Yeah, it changed a lot. They get used to get fat around July and nowadays in July they have a thin fat because the weather gets hot, and [that is] how come they get fat later. Towards September, that is the only time the fat gets a little thicker… Yeah, [on] hot days the caribou are running around too much to get away from the mosquitos.* (SRB&A Nuiqsut Caribou Panel Meeting November 2012)

The elders also observed differences and changes in the taste of caribou. Several commented that caribou harvested west of the community, near Atqasuk and Wainwright, taste better than the caribou harvested near Nuiqsut. One of these elders indicated that this started occurring within the last 10 years. These elders believe that contamination related to development affects the taste of the caribou. The following are descriptions of changes and variations in the taste of caribou:

> *Yeah, some of them, I don't even feel like eating sometimes when I get one like that. Tastes different, even if it's fat. I don't know why it tastes different, can't figure out why they taste like that. Because good caribou taste real good to eat. It's been how many years now, five, six years? They'll be fat, but taste different. They could notice it and can't even eat it. Once you get it from this west side the caribou are good and more tastier. Even from the right they taste good. Some of them taste good around here. The ones close to the bank and stuff eat some of the stuff that's been polluted and they are different from one caught on the west side. When I have some caribou from Wainwright they taste good. Around here, that area, right around here. A couple years ago the two he had, one from here and one around there, taste different, could hardly eat them.* (SRB&A Nuiqsut Interview March 2009)

> *The one coming from the west is real tasty but the ones staying around here change. The ones that be staying around here is [not good]. There's no pipeline, no anything [in Atqasuk]. There's nothing around, so the caribou are really tasty and heathy.* (SRB&A Nuiqsut Interview March 2009)

One elder commented that the incidence of sick caribou has increased since Alpine development began, saying,

> *When they get caribou that are sick they leave it alone. Give it to eagle. They used to get some sick caribou, but they mostly showed up after Alpine. Some of them got sore right there, inside the joints, can't move. Some of them caribou, in the bone marrow they have yellow pus, are sick.* (SRB&A Nuiqsut Interview March 2009)

In addition, concerns remain about contamination from Umiat, a former military site. One elder commented that many of the changes in caribou can be traced back to that contamination. She observed

> *One drum diesel, five gallon motor gas, they were floating down the river. Some changes in the 40s and 50s, there were lots [of changes] from the Navy explorations. Some of the buoys were left behind before they clean up that area. The caribou changed, and everything changed with the caribou. Notice that, I trace changes back to that. That's what I know happened. From Umiat. I think it was 15 years ago [drums floating down the river]. They been cleaning up slowly, but they're still out there. (SRB&A Nuiqsut Interview March 2009)*

APPENDIX B NUIQSUT CARIBOU MONITORING PROTOCOL, ACTIVE HARVESTER INTERVIEW YEAR 5

NUIQSUT CARIBOU MONITORING PROTOCOL, 2012

Date _____
Respondent Name _____
Respondent Birth date _____
Birthplace _____
Years in Community _____

SECTION A: CARIBOU HUNTING ACTIVITIES, NOVEMBER 2011 – OCTOBER 2012

1. Did you go caribou hunting between November 2011 and October 2012? YES ___NO___ (IF NO, INTERVIEW OVER)
2. Where did you hunt for caribou between November 2011 and October 2012? (Draw caribou hunting areas on map)

FOR EACH CARIBOU HUNTING POLYGON, RECORD THE FOLLOWING INFORMATION ON THE MAP [**CHECK BOX WHEN COMPLETE**]:

	Months	**Transportation Method(s)**	**Number of Trips**	**Duration of Trip(s) [*Longest and typical*]**	**Did you harvest caribou here? (Y/N)**	**Where? (Mark harvest locations)**	**How many caribou?**	**Sex of harvested caribou (M/F)**	**Harvest months (by harvest location)**
POLY 1									
POLY 2									
POLY 3									
POLY 4									
POLY 5									

3. Compared to 2011, was your hunting area different in 2012? YES _____ NO _____

3a. [IF YES], HOW? _____

_____

3b. [IF YES], WHY? _____

_____

4. Compared to 2011, was the # of hunting trips in 2012 the same, less, or more? LESS _____ SAME ____ MORE ____

4a. [IF LESS OR MORE], WHY? _____

_____

5. Compared to 2011, was the duration of trips in 2012 the same, less, or more? LESS _____ SAME ____ MORE ____

5a. [IF LESS OR MORE], WHY? _____

_____

6. Compared to 2011, were the months you hunted for and harvested caribou in 2012 different? YES _____ NO ____

6a. [IF YES], HOW? _____

_____

6B. [IF YES], WHY? _____

_____

7. Compared to 2011, was the # of caribou you harvested in 2012 the same, less, or more? LESS _____SAME __ MORE ___

7a. [IF LESS OR MORE], WHY? _____

_____

8. Did your household harvest enough caribou in 2012 to meet your needs? YES_____ NO _____

8a. [IF NO], WHY? _____

_____

SECTION B: ASSESSMENT OF HARVESTED CARIBOU, 2012

1. Thinking about the caribou you shot or harvested in 2012, did you notice any of the following?

(If none, Skip to Section C)

_____ Disease, infection, discolored meat (health)

_____ Unusual taste or smell (quality)

_____ Unusual fat content or overall size (size)

_____ Unusual quantity of parasites (flies)

_____ Other observations

2. For caribou with the above observations, complete the following (Use additional sheets if necessary):

Type of Observation: _____ Health _____ Quality _____ Size _____ Parasites _____Other

Please describe the abnormality: _____

_____

_____

_____

_____

Please describe why you think the abnormality occurred: _____

_____

_____

_____

_____

Where were these caribou harvested? [Record Harvest Location Point]: _____

Did you use this caribou? YES _____ NO _____

SECTION C: IMPACTS ON CARIBOU HUNTING, 2012

1. In 2012, did you experience any impacts on your caribou hunting related to CD4 or any other Alpine Satellite Developments? _____ YES _____ NO

[If YES, complete the following table]:

In 2012, did you experience any impacts related to CD4 or Alpine Satellite…	**√ if YES**	**Mark Location on Map [POINTS ONLY] (√ if done)**	**Month**	**Please describe** **[*For helicopter and plane traffic, collect data about color of aircraft and aircraft number, if possible]**
Helicopter traffic*				
Plane traffic*				
Other traffic				
Oil company personnel				
Structures (e.g., pipelines) blocking hunter access				
Regulations				
Seismic lines or activity				
Other				

SECTION D: ADDITIONAL OBSERVATIONS ABOUT CARIBOU, 2012

1. Was there anything else abnormal about the behavior, distribution, or migration of caribou in 2012? YES _____ NO ____

1a. [IF YES], Please Explain: _____

APPENDIX C: NUIQSUT HOUSEHOLD CARIBOU HARVEST SURVEY FOR 2012

NUIQSUT HOUSEHOLD CARIBOU HARVEST SURVEY FOR 2012

In its permit to ConocoPhillips Alaska, Inc. (CPAI) for development of CD4, the North Slope Borough required that CPAI implement a subsistence monitoring program to measure the impacts of CD4 and other Alpine Satellite developments on Nuiqsut subsistence hunting and harvesting. CPAI contracted Stephen R. Braund & Associates to monitor Nuiqsut caribou harvests to fulfill this requirement. SRB&A is working with KSOPI and a panel of Nuiqsut caribou experts to implement the monitoring program. Part of this program is to record yearly harvests and uses of caribou by the community of Nuiqsut so that these harvests and uses can be compared over time. Your individual information will remain anonymous.

HH ID: _____ Person Responding to Survey (check one): ____ Head of HH _____ Other Adult HH member
Interviewer: _____ Date: _____ Number of People in HH: _____

Between January and December 2012…

1. Did you or anyone in your household use caribou (e.g., harvested, received, or utilized in the home)? _____YES _____ NO

2. Did you or anyone in your household try to harvest caribou? _____YES _____ NO (If NO, Skip to Q6)

3. Did you or anyone in your household successfully harvest caribou? _____ YES _____ NO (If NO, Skip to Q6)

4. How many caribou did your household harvest (only harvested or shot by residents in your household; do not count other households' harvests) in 2012? _____

5. Were any of the harvested caribou sick or injured? _____ YES _____ NO, Use? _____ YES _____ NO

6. Did you or anyone in your household receive caribou from other households? _____ YES _____NO

7. Did you or anyone in your household give caribou to other households? _____YES _____ NO

8. Did any Alpine-related activities in 2012 make your household's caribou hunting more difficult? _____ YES _____ NO

8a. (If YES) Please describe what happened: _____

_____

_____

[**Continue notes on back of page if necessary**]

APPENDIX D: NUIQSUT CARIBOU MONITORING INFORMED CONSENT, YEAR 5

Stephen R. Braund & Associates

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srba@alaska.net

Nuiqsut Caribou Subsistence Monitoring Project
November 2012
Informed Consent Form

Description of the Study

Stephen R. Braund & Associates (SRB&A) has been contracted by ConocoPhillips Alaska, Inc. (CPAI) to conduct a caribou subsistence monitoring project in Nuiqsut. In their CD4 permit from the North Slope Borough (NSB), CPAI is required to conduct a subsistence study to monitor the impacts CD4 and other Alpine satellite developments may have on Nuiqsut subsistence hunting and harvesting. The purpose of the research is to evaluate the short and long term effects of CD4 and other CPAI satellite developments on the people of Nuiqsut. It is important that this analysis relies on current and accurate subsistence information from Nuiqsut caribou hunters. This project is designed to gather relevant subsistence use information as well as residents' observations and perceptions of changes to subsistence over time. This is the fourth year of the study.

While in your community, we would like to interview knowledgeable subsistence harvesters about their caribou subsistence use between November 2011 and October 2012. We would also like to document the thoughts of Nuiqsut residents about changes in subsistence harvest and use patterns as well as impacts to caribou hunting during the study period.

Risks and Benefits of Being in the Study

This study is intended to provide current and accurate information in order to monitor the impacts of CD4 and other Alpine satellite developments on Nuiqsut caribou subsistence use. As such, any relevant information that helps avoid, minimize or mitigate environmental impacts is likely to benefit those who live in the area potentially affected by oil and gas development or use resources from the area. With any project of this kind, there is no guarantee how the information will be used in the future.

Anonymity

Your name will not be used in our study without your permission. Some people wish to be acknowledged for participating in this kind of study. Others prefer that their names are not mentioned in publications and reports. The decision is entirely up to you.

Confidentiality

Individual harvester information will remain confidential and will not be included in either the maps or report.

Voluntary Nature of the Study

Your decision to take part in the study is voluntary. You are free to choose not to take part in the study or to stop taking part at any time without any penalty to you.

Honoraria

SRB&A will pay honoraria to each participant who completes the entire interview.

Contacts and Questions

If you have questions, please contact Stephen Braund during the interview or workshop, or afterwards at 907-276-8222.

Statement of Consent

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study.

Signature & Date	Printed Name

APPENDIX E: HARVEST ACTIVITY AND HARVESTED RESOURCE ASSESSMENT CODES

Table D-1: Harvest Activity Assessment Codes

Numeric Code	Code Name	Notes
	How Codes	
100	Harvest more	Respondent harvested more caribou (this does not apply to respondents who used more caribou, i.e., received more caribou from relatives).
150	Take more trips	Respondent took a higher number of caribou hunting trips compared to the previous study year.
151	Take longer trips	Respondent's caribou hunting trips were of a longer duration compared to the previous study year.
200	Harvest less	Respondent harvested less caribou (this does not apply to respondents who used less caribou, e.g., received less caribou from relatives).
250	Take fewer trips	Respondent took a lower number of caribou hunting trips compared to the previous study year.
251	Take shorter trips	Respondent's caribou hunting trips were of a shorter duration compared to the previous study year.
293	Smaller hunting area	Respondent used a smaller overall area to hunt caribou compared to the previous study year.
294	Later hunting season	Respondent started hunting caribou later in the hunting season compared to the previous study year.
297	Expanded use area	Respondent used a larger overall area to hunt caribou compared to the previous study year.
310	Travel farther to harvest resource	Respondent reported traveling a greater distance in search of caribou compared to the previous study year.
312	Travel shorter distances	Respondent reported traveling a shorter distance in search of caribou compared to the previous study year .
340	Use area changed	The respondent did not travel to usual caribou hunting areas.
341	Harvest season changed	The timing of the caribou hunting season was earlier or later than usual, or the respondent did not hunt during a particular hunting season.
352	Utilizing new or different areas	Respondent traveled to new areas in search of caribou.
857	Resource moved to different areas	The caribou was not in the respondent's usual hunting area at the usual time; this does not include observations of caribou migration being diverted.
	Why Codes	
110	Need more	Used in response to why respondent harvested or used more caribou.
120	Better transportation/equipment	Used in response to why a respondent too longer or more frequent trips (e.g., "I went out more because I got my outboard fixed")

Numeric Code	Code Name	Notes
150	Take more trips	Used in response to why respondent harvested or used more caribou (i.e., "I got more caribou this year because I went hunting more").
200	Harvest less	Used in response to why a respondent did not harvest enough caribou during the study year.
210	Need less	Used in response to why respondent harvested or used less caribou.
212	Sharing More	Used in response to why respondent harvested more caribou or did not harvest enough caribou (i.e., "I had to harvest more caribou this year because I was hunting for another household").
220	Personal Reasons	Includes general factors related to age, illness, or personal interest. More specific personal reason codes include "Employment /Lack of Time" and "Change in subsistence providers/dependents".
250	Take fewer trips	Used in response to why respondent harvested or used less caribou (i.e., I couldn't go out hunting as much this year, so I didn't get as many caribou").
252	Reduced harvest opportunities	Used in response to why a respondent did not harvest enough caribou during the study year (e.g., "I didn't' harvest enough. I never saw any caribou when I was out hunting").
255	Change in subsistence dependents	Used in response to why respondent harvested more or less caribou (i.e., "We harvested less caribou because our son moved away and we don't need as much").
256	Change in subsistence providers	Used in response to why respondent used more or less caribou (i.e. "I had less caribou because my son (main provider) moved away").
260	Employment/Lack of Time	Used in response to why respondent harvested less caribou, took fewer trips, or took shorter trips ("i.e., I didn't go hunting as much because I had to work").
270	Increased cost of living/expenses	Used in response to why respondent took fewer trips, shorter trips, or longer trips (i.e., "I went hunting less because gas is so expensive" or "I stayed out longer because I didn't want to come home empty-handed. Gas is too expensive").
290	Lack of transportation/equipment	Used in response to why respondent took fewer trips, harvested fewer caribou, or why their use area changed (i.e., "I didn't go hunting west of Nuiqsut in the fall because my four-wheeler broke down").
301	Worse success	Used in response to why respondent did not harvest enough or harvested less (e.g., "I had poor success this year" or "I never got lucky this year").
310	Travel farther to harvest resource	Used in response to why respondent took longer trips (i.e., "I stayed out longer because we had to go farther to find caribou").
321	Competition with sport hunters	Used in response to why respondents harvested less caribou or took more trips.
351	Better success	Used in response to why respondent harvested more caribou (e.g., "I was more successful this year").

Numeric Code	Code Name	Notes
503	Shallower Rivers/Lakes	Used in response to why respondents' use area changed (i.e., "We didn't hunt up Anaktuvuk River this year because it was too shallow").
505	Climate affecting travel	Used in response to why respondents' use area changed (i.e., "We didn't hunt up Anaktuvuk River this year because it was too shallow").
508	Wind	Used in response to why respondents' use area changed (i.e., "We didn't go to Fish Creek this year because the wind was blowing and the ocean was too rough").
532	Weather	Used in response to why respondent's use area changed (i.e., "I didn't go upriver this year. It was too hot up there and there were too many mosquitoes").
600	Traffic Disturbance	Used in response to why respondent took more trips, harvested less caribou, or did not harvest enough caribou (i.e., "I harvested less caribou because of air traffic/development/oil drilling/pipelines"). This code is used when the respondent does not elaborate on how the activity affected their subsistence uses (i.e., "I harvested less caribou because the caribou were diverted by the pipeline").
603	Airplane Traffic Disturbance	
650	Development	
659	Oil Drilling	
661	Pipeline	
663	Contamination from air pollution	
701	Sport hunting methods disturbing migration routes	Used to describe a diversion of caribou migration specifically attributed to sport hunting activity, including associated hunting pressure, airplane traffic, and hunting methods.
806	Resource Availability	A general response to any change in harvest activities (i.e., "I harvested less because I couldn't find any caribou").
808	Skittish behavior in species	Used in response to respondent harvesting less caribou (i.e., "I harvested less caribou; the caribou were moving around a lot and staying inland because of the helicopter traffic").
809	Predators	Used in response to respondent harvesting less caribou (i.e. "I harvested less caribou because there are more wolves killing them").
818	Increase in Predators	Used in response to respondent harvesting less caribou (i.e. "I harvested less caribou because there are more wolves killing them").

Numeric Code	Code Name	Notes
850	Migration changed or diverted	Used when a respondent indicates that the caribou migration has changed or been diverted, usually by human activities or man-made infrastructure (i.e., "I didn't harvest any caribou because all the air traffic diverted them south of the community").
851	Further from Village	Used to describe an animal being farther from the community than respondent is accustomed to; specific to the resource's distance from the community.
853	Earlier Migration/Arrival	Used in response to respondent harvesting less caribou (i.e., "I harvested less this year; I usually harvest some in October, but the caribou left early").
856	Change in Resource's Food Availability	Used to describe an animal moving to another area in search of better feeding grounds (i.e., "the caribou overgrazed the area and moved west to find better feeding").
857	Move to Different Areas	Used to describe caribou moving to different areas within the study year.
865	Change in distribution/migration	Used to describe respondents' general observation that caribou were not in the area, either through a change in distribution or migration.
870	Moved into area	Used in response to respondent harvest more caribou (i.e., "We got more this year; there were more caribou in the area this year.")
871	Moved out of area	Used in response to respondent harvesting less caribou (i.e., "I didn't harvest as much caribou this year; there weren't any caribou around).
872	Farther from riversides/farther inland	Used to describe caribou being less available along riversides, usually due to disturbance from boat or air traffic.
998	I Do not Know	Used when a respondent states "I don't know."
999	Not ascertained	Used when the researcher did not obtain a response to the question.

Table D-2: Harvested Resource Assessment Codes

Numeric Code	Code Name	Notes
	How Change	
814	Increase in Resource Size	Includes overall size (e.g., larger than usual animals) or fat content
815	Decrease in Resource Size	Includes overall size (e.g., smaller bulls) or fat content
820	New Species in Region	The respondent observed or harvested a type of caribou not previously seen or rarely seen (e.g., "Mountain caribou," reindeer)
829	Physical Abnormalities	Deformity the resource was born with
830	Change in Texture of Meat	Includes color of meat
831	Disease/Infection	Includes cysts, nodules, pus on insides, etc. Something that the resource contracted.
842	Change in Smell of Meat	Respondent harvested a caribou with unusual-smelling meat.
845	Change in Resource Quality	Respondent harvested a caribou that was of lesser quality than usual (e.g., "One of the caribou didn't have much flavor like they usually do").
876	More Parasites	Respondent observed more parasites than usual in harvested caribou.
877	Fewer Parasites	Respondent observed fewer parasites than usual in harvested caribou.
	Why Change	
509	Warmer Temperatures	In response to why there is a decrease in caribou size (e.g., "They were skinny; maybe it was too hot").
521	Wildfires	In response to why there is a new species in region.
603	Airplane Traffic Disturbance	In response to why there is a decrease in caribou size (i.e., "The caribou are running around a lot because of the airplanes").
605	Air Traffic	In response to why there is a decrease in caribou size (i.e., "The caribou are running around a lot because of the airplanes").
654	Human Waste/Pollution	Used when a respondent specifically cites general pollution or human waste as the cause of a caribou abnormality.
656	Oil Spill Contamination	Used when a respondent specifically cites contamination from oil spills as the cause of a caribou abnormality.
663	Contamination from Air Pollution	Used when a respondent specifically cites air pollution, usually related to oil development, as the cause of a caribou abnormality.
812	Resource in Smaller Groups	Used to describe caribou being more sparsely populated and distributed into smaller groups rather than one large herd.
823	Contamination	Used when a respondent cites contamination in general as a cause of an abnormality in caribou.
831	Disease/Infection	Used when a respondent cites disease/infection as the cause of the abnormality (e.g., "This caribou had a lot of parasites, I think because it was sick").

832	Parasites	Used when a respondent believes that parasites are the cause of the abnormality (e.g., sick or diseased looking caribou)
841	Resource Injury	Used when a perceived abnormality is caused by the resource being wounded previously by a bullet or predator.
876	More Parasites	Used when a respondent believes that parasites are the cause of the abnormality (e.g., sick or diseased looking caribou)
879	Reindeer	Used as an explanation for an abnormality in caribou (i.e., "That caribou was much smaller than usual. I think it was a reindeer").
908	Natural Causes	Used when the respondent indicates that the cause of the abnormality is natural (i.e., "There were a lot of flies under the skin, more than I've ever seen. I think it was because of the time of year").
998	I do not know	Used when a respondent states "I don't know."
999	Not Ascertained	Used when the researcher did not obtain a response to the question.