Nuiqsut Caribou Subsistence Monitoring Project:

Results of Year Three Hunter Interviews and Household Harvest Surveys

Prepared for

ConocoPhillips Alaska, Inc.

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EXECUTIVE SUMMARY

This Year 3 report presents the first three years of data for the Nuiqsut Caribou 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 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) industry mitigation activities; and (4) caribou harvests over time. This third annual report is based primarily on hunter observations and a comprehensive household caribou harvest survey. An important function of the report is to identify additional data monitoring components most relevant to developing a common understanding of these impacts.

In November of 2010, SRB&A conducted interviews with 60 Nuiqsut caribou hunters regarding their caribou hunting activities between November 2009 and October 2010 (Year 3). These data complemented data collected regarding residents' hunting activities in 2008 (Year 1) and 2009 (Year 2), which were presented in a Year One report (2009) and a Year Two report (2011). During the November 2010 interviews, hunters provided Year 3 use areas, harvest locations, and harvest characteristics, in addition to observations about changes in harvest activities, impacts on hunting activities, conditions of harvested caribou, and assessments of mitigation actions.

Study participants identified 215 caribou subsistence use areas and 196 caribou harvest locations for the Year 3 study year, the majority of which were located along the Colville River (including Nigliq Channel) and west of the community toward Fish Creek. The average pounds harvested per household in the 2010 survey (707 pounds) is comparable to harvest estimates made in 2006-07, 2004-05, and 2003-04; it is higher than harvest estimates made in 2000-01, 2002-03, and 2005-06, and higher than earlier estimates made in 1994-95 and 1995-96. Year 3 results showed a marked decrease in the percentage of harvester respondents who reported that they did not harvest enough caribou to meet their needs. Compared to Years 1 and 2, Year 3 results show a substantial decrease in the percentage of harvester respondents who reported that less caribou were harvested and a small increase in the percentage of respondents who reported that more caribou were harvested compared with the previous year. The percent of respondents observing one or more caribou with abnormalities declined from 64 percent in Year 1 to 38 percent in Year 2 and 40 percent in Year 3.

Sixty-one percent of respondents in Year 3 reported one or more development impacts on caribou hunting. This compares with 83 percent of respondents in Year 1 and 70 percent of respondents in Year 2. As in the case of Year 1 and Year 2, the most commonly reported impact is associated with helicopter traffic, with 51 percent of harvester respondents reporting helicopter traffic impacts in Year 3. These observations account for almost half (48 percent) of all impact observations in Year 3. Ongoing data collection in 2011 (for Year 4) and additional years will assist in gaining a greater understanding of the nature of these impacts and changes 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 three 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 the Nuiqsut panel of caribou experts, providing space to conduct interviews, and assisting with contacting local residents. We would also like to thank the panel of caribou experts 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 60 Nuiqsut caribou hunters and elders who provided us with the information for year three of this study, and the 78 Nuiqsut households who participated in the Year 3 household harvest surveys.

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ACRONYMS AND ABBREVIATIONS

ABR	ABR Inc.—Environmental Research & Services
ADF&G	Alaska Department of Fish and Game
ANWR	Arctic National Wildlife Refuge
ASDP	Alpine Satellite Development Plan
CAH	Central Arctic Herd
CPAI	ConocoPhillips Alaska, Inc.
GIS	Geographic Information System
KSOPI	Kuukpik Subsistence Oversight Panel, Inc.
NPRA	National Petroleum Reserve – Alaska
NSB	North Slope Borough
PH	Porcupine Herd
SPSS	Statistical Package for the Social Sciences
SRB&A	Stephen R. Braund & Associates
TH	Teshekpuk Herd
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 within a 30-mile radius of CD4. 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 within the 30-mile radius of the CD4 development.

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. While the NSB permit originally stipulated that CPAI measure impacts of CD4 and other satellite developments within 30 miles from CD4, the 30-mile radius was later removed from the NSB permit for CD4 due to requests from Kuukpik Corporation and the community of Nuiqsut. 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) industry mitigation activities; and (4) historical subsistence use. This third annual report is based primarily on hunter observations and household surveys. An additional section provides an update of 2010 population and distribution trends for the Teshekpuk and Central Arctic herds as provided by the biological consulting firm ABR, Inc. 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 three 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; and November 9 and 19, 2010 for Year 3. The report also contains the results of the household caribou harvest surveys conducted between February and May, 2011, for the 2010 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

Impacts related to CD4 and other 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 and 2 show place names in the study area.

METHODS

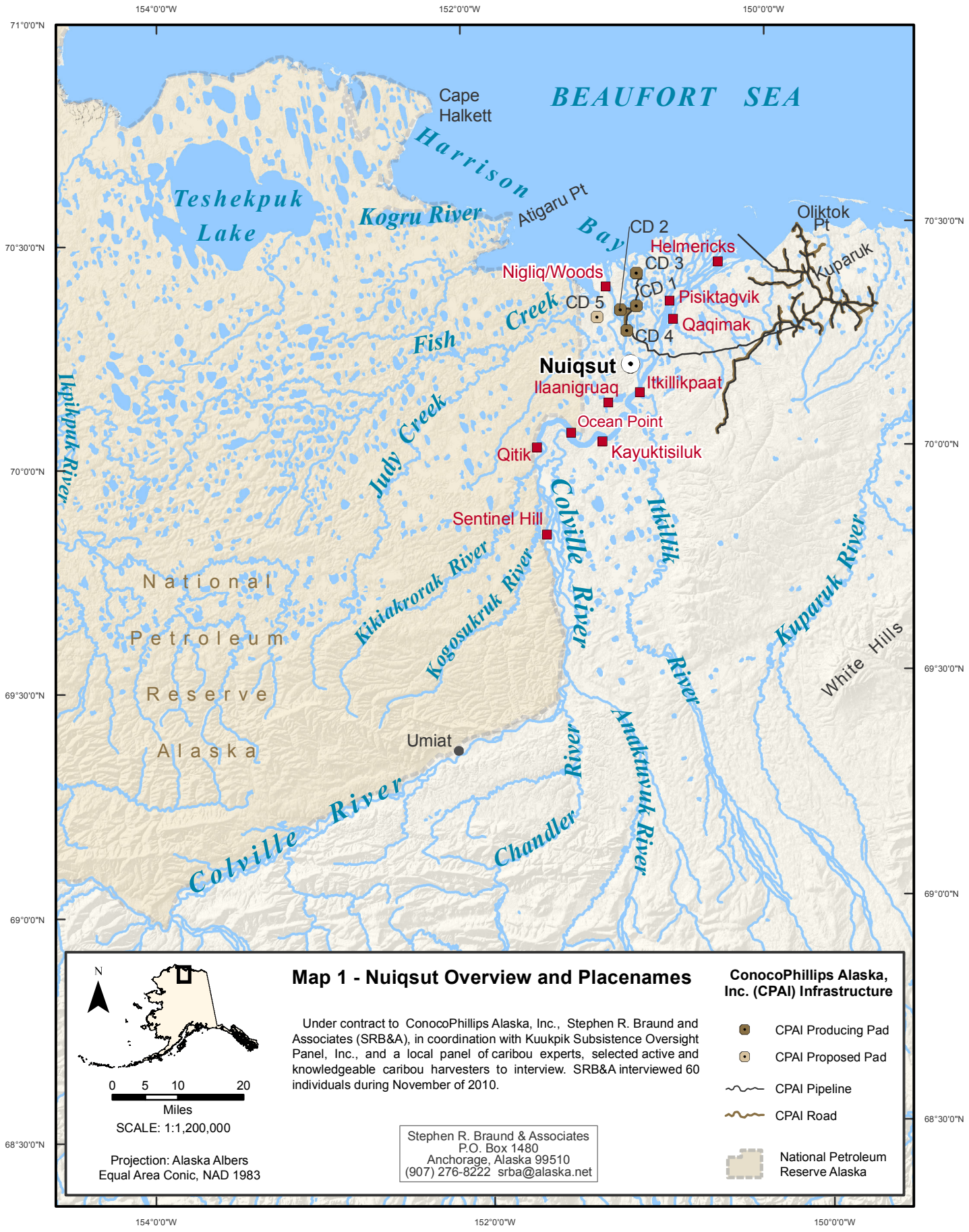
In 2009 SRB&A initiated a program to gather yearly information from local Nuiqsut residents about caribou hunting and harvest activities, observations about harvested caribou, changes in caribou, and impacts on caribou hunting. These data are gathered on a yearly basis in order to monitor impacts on caribou hunting related to CD4 and other Alpine satellite developments over time. This section of the report describes the methods used during Year 3 to design and implement the study. Year 3 active harvester interviews gathered information for harvesting activity between November 2009 and October 2010 and household harvest surveys gathered information for the 2010 calendar year (January to December 2010). Interviews, surveys, and meetings for Year 3 took place between September 2010 and May 2011. Thus, the methods describe 2010 and 2011 monitoring program activities, while the results and discussion describe the Year 3 study period caribou harvest amounts, hunting activities, and impacts (spanning from November 2009 to December 2010).

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 3 monitoring program was through contact with the Kuukpik Subsistence Oversight Panel, Inc. (KSOPI) and the previously formed Nuiqsut panel of caribou experts. As discussed in the Year 2 report (SRB&A 2011), SRB&A traveled to Nuiqsut on September 30, 2010 to meet with the caribou panel and plan Year 3 fieldwork; a second meeting with KSOPI (which included members of the caribou panel) occurred on October 1, 2010. The study team then coordinated with KSOPI and with caribou panel members to plan and implement Year 3 fieldwork. SRB&A sent copies of the Year 2 draft report (in February 2011) and final report (in May 2011) to KSOPI and to each of the Nuiqsut caribou panel members. SRB&A traveled to Nuiqsut in May 2011 and participated in meetings with the caribou panel of experts in which the Year 2 data were presented. Two separate meetings were held, the first on May 3, 2011 in which three panel members were in attendance, and the second on May 4, in which four KSOPI members, three of whom were on the Nuiqsut caribou panel, were in attendance. The following is a summary of Year 3 meetings with the Nuiqsut caribou panel and KSOPI.

Nuiqsut Caribou Panel Meetings

SRB&A traveled to Nuiqsut during the last week of September 2010 to meet with the Nuiqsut caribou panel. After coordination with KSOPI and individual panel members and distribution of the meeting agenda to the panel's primary point of contact, SRB&A arranged a panel meeting for September 30, 2010, as well as a KSOPI meeting for October 1, 2010. The panel meeting took place at the KSOPI office



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 60 individuals during November of 2010.

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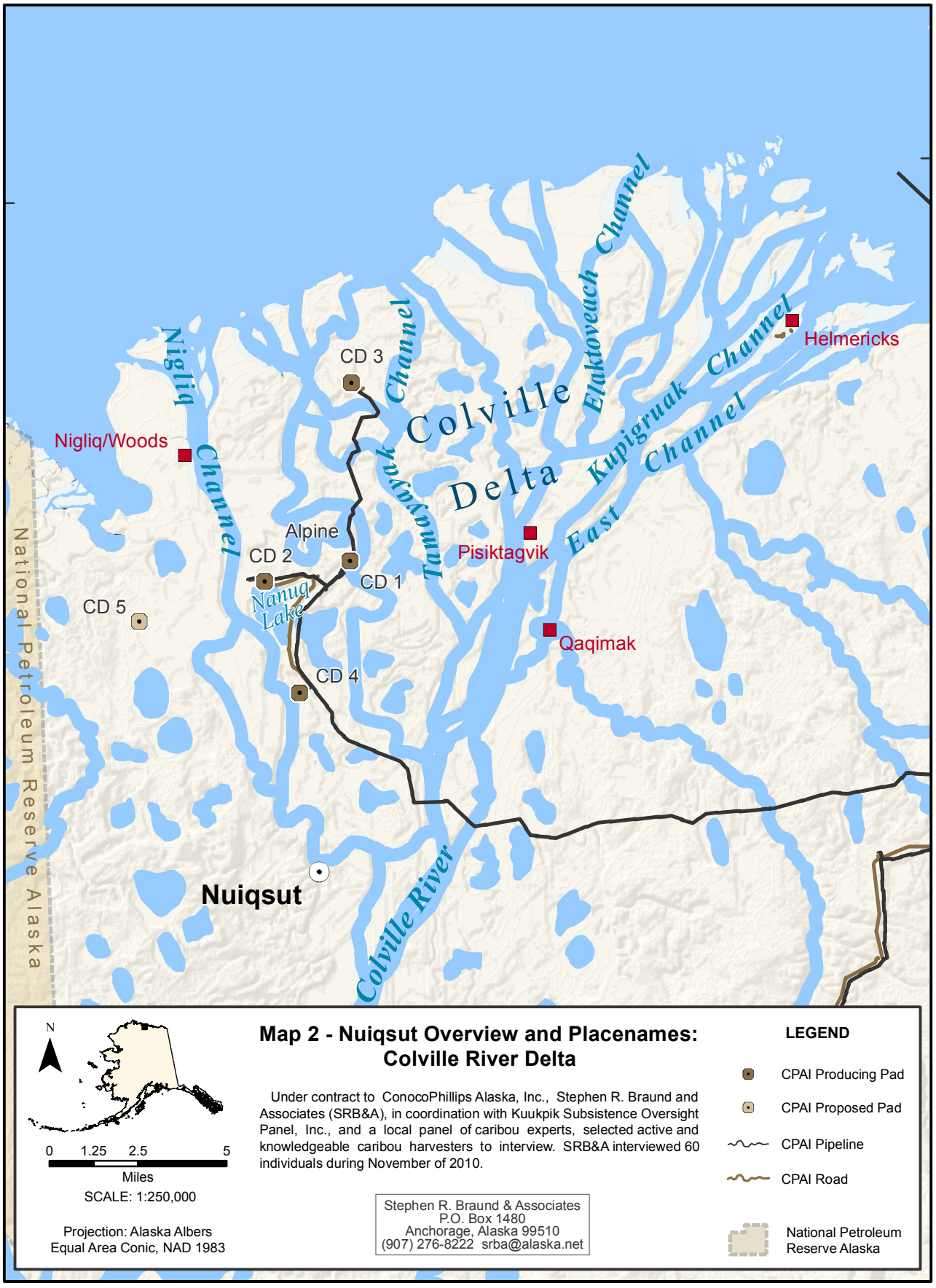
ConocoPhillips Alaska, Inc. (CPAI) Infrastructure

- CPAI Producing Pad
- CPAI Proposed Pad
- CPAI Pipeline
- CPAI Road
- National Petroleum Reserve Alaska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Map 2 - 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 60 individuals during November of 2010.
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LEGEND
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and five panel members were present. One panel member (an elder) had passed away since SRB&A's previous trip to Nuiqsut and two elder panel members were in the hospital. Thus, the first item on the meeting agenda was to discuss addition of new panel members. Other topics on the agenda included a review of the 2010 caribou hunting season and implementation of Year 3 monitoring activities. During the meeting, panel members provided the following comments and suggestions regarding monitoring activities:

- The panel agreed to invite three new residents to join the Nuiqsut caribou panel (two of whom had called SRB&A and expressed interest in participating on the panel).
- The panel discussed the possibility of assigning alternates to the caribou panel and was instructed to develop a list of alternates to submit to SRB&A.
- The primary impact reported in 2010 was helicopter traffic. Several panel members described personal experiences with the impact of helicopter traffic on their hunting activities in 2010.
- Panel members would like to know who to contact when they experience an impact and would like to have a more direct way to report hunting impacts.
- The distribution of CPAI mitigation funds and fuel vouchers by the City of Nuiqsut is a topic of concern. Often, the same individuals get the vouchers before others in the community have a chance.
- The panel believed that it would be best for interviews to occur in November while hunters' memories of the previous hunting season are still fresh.

On October 1, 2010, SRB&A met with KSOPI board members to provide a review of the September 30 Nuiqsut caribou panel meeting and discuss future monitoring activities. Board members discussed the possibility of SRB&A returning to Nuiqsut in November to conduct active harvester activities; while some agreed that November would be best and that a number of hunters would be unavailable in January and February due to ice road work, others noted that the coming months would be busy with holidays, dividends, and other events. The KSOPI chairman instructed SRB&A to work with the KSOPI executive director to determine the best time to return to the community. Another topic of discussion at the KSOPI meeting was the possibility of implementing term limits for Nuiqsut caribou panel members. KSOPI agreed to assist SRB&A in drafting a formalized charter for the Nuiqsut caribou panel, which caribou panel members would review and finalize.

The study team met with members of the Nuiqsut caribou panel again on May 3 and 4, 2011 to review Year 2 data, record comments from panel members, and to review the progress and status of the caribou monitoring project. The May 4 meeting was a KSOPI meeting that was attended by four KSOPI board members, three of whom were also Nuiqsut caribou panel members.

Three panel members attended the May 3, 2011 meeting and three attended the May 4, 2011 meeting. The same information was presented by SRB&A at each of the meetings, which were held separately to accommodate panel members' schedules and availability. During the meetings, panel members provided the following comments and suggestions regarding monitoring activities:

- The study team should coordinate with state and other biologists to incorporate current information about new and re-occurring trends with caribou migration and habits.
- SRB&A should continue to acquire traditional knowledge from local elders and incorporate traditional knowledge into yearly reports to help document more long-term changes in caribou migration, numbers, behavior and health.

- SRB&A should attend meetings held in Nuiqsut by CPAI representatives regarding communication of aircraft schedules and activities in the Nuiqsut area.
- It would be best for the study team to return 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.
- Caribou panel members agreed to develop procedures regarding adding and replacing panel members to the board in order to keep active harvesters involved in the panel, as well as the creation of a set of panel bylaws at their next meeting.
- It was suggested by some panel members that SRB&A staff travel to Nuiqsut during the caribou hunting season in order to observe and record air traffic during this time. There were differing opinions at each meeting as to the whether the presence of SRB&A staff during the caribou hunting season would affect the success of the monitoring project. Panel members attending the May 3 meeting thought it would produce positive results, whereas panel members attending the May 4 meeting suggested that any possible interference with the hunting season could be disruptive to the community.

SRB&A agreed to return to the community in the fall of 2011 to meet with the Nuiqsut caribou panel and discuss initiation of Year 4 fieldwork.

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 data collection.

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:

- Compilation of available caribou data from biological reports and distribution of these data to local hunters.
- 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.

The study team addressed the first component (compilation of available caribou data) in this Year 3 report and plans to address the second component (work session between hunters and biologists) during Year 4.

Field protocols and maps for the active harvester interviews and household surveys had been developed during Years 1 and 2. The study team updated the active harvester and household survey protocols for Year 3 fieldwork (Appendices A and B). The study team used an informed consent that guaranteed the confidentiality of respondent information, anonymity of persons interviewed, and the reporting of aggregated data only (see Appendix C).

Active Harvester Interviews

SRB&A used the active harvester protocol during annual interviews with Nuiqsut caribou hunters (see Appendix A). The protocol consisted of three sections: 1) Caribou Hunting Activities; 2) Assessment of Harvested Caribou; and 3) Impacts on Caribou Hunting. The protocol was designed to gather 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. 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 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). Thus, Year 2 and Year 3 study periods overlap by 2 months, with both study years including November and December 2009. Subsequent study years will cover the same time period (November through October) for the active harvester interviews.

The first section of the active harvester interviews (Caribou Hunting Activities) included mapping of Year 3 hunting areas and harvest locations. 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 3)
- 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

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 3:

- 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/larvae)
- 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 3 related to CD4 or other Alpine Satellite developments. If respondents indicated that they had experienced impacts in Year 3, then researchers asked them specifically about the following potential impacts:

- Helicopter traffic
- Plane traffic

- Other traffic
- Oil company personnel
- Structures blocking hunter access
- Regulations
- Seismic lines or activity
- Other

For each impact observation, respondents provided the months the impact occurred (if applicable), a description of the impact, and suggestions for how the impact could have been lessened. Respondents were then asked to assess the following mitigation actions in regards to helpfulness and need for improvement:

- Dull coatings on pipelines
- Pipelines at least seven feet
- Rounded drilling pads
- Fencing around CD4
- Fuel voucher funding
- Subsistence representatives
- Free gas
- Local hire

Household Caribou Harvest Surveys

The study team added the harvest survey component to the monitoring plan during Year 1 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 (see SRB&A 2010, SRB&A 2011 for a description of the previous efforts to complete the household surveys).

The study team met with representatives at the Nuiqsut Trapper School in September 2010 to discuss the possibility of involving high school students in the implementation of the household caribou harvest survey for the Year 3 data. The involvement of the high school students was partially in response to a request by members of the Kuukpik Corporation board to engage local students in the project, as well as study team members' previous success working with high school students in similar harvest surveys. During the meeting with school representatives, it was agreed that the students would help collect household information for community members during February and March of 2011, and SRB&A staff would complete any remaining surveys to achieve a minimum response rate of 80 percent. SRB&A sent 175 copies of the Household Survey Forms, as well as three copies of a household list provided by the City of Nuiqsut, to the Nuiqsut Trapper School on February 1, 2011 to be distributed to students who agreed to help implement the survey.

The Year 3 household caribou harvest surveys addressed the 2010 calendar year (January 2010 through December 2010) and consisted of eight questions regarding caribou harvests during the Year 3 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 2010?
- During which months did you harvest these 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 2010 make your household's caribou hunting more difficult?

The study team followed up with the school in March 2011 to review the status of completed household harvest surveys. The teacher coordinating the surveys informed SRB&A that the students had completed some surveys but had not reached an 80 percent response rate, and the study team decided to return to Nuiqsut to collect the completed survey forms and conduct the remaining household surveys. While meeting with the NSB Department of Wildlife Management in March 2011, the study team was informed that the NSB had recently filled the subsistence research specialist position in Nuiqsut and that this individual would be able to assist SRB&A in their survey efforts.

SRB&A staff coordinated with KSOPI and traveled to Nuiqsut in May, 2011 to collect the surveys completed by students of the Nuiqsut Trapper School and complete additional surveys in the community. SRB&A worked with a local community liaison (identified with the assistance of KSOPI) as well as the current NSB Subsistence Specialist in Nuiqsut to compile household contact information and finalize the household list.

During the draft review meeting with the Nuiqsut caribou panel in May, 2012, panel members noted that the study team may run into difficulties with documenting community harvests because of the nature of harvesting activities in their community. First, panel members noted that each household may have multiple hunters that hunt separately rather than in the same hunting group and therefore may be unable to report the harvests of their entire household. To address this potential issue, if an individual indicated that they were unsure how many caribou another individual in their household harvested, then the study team tried to contact that individual separately to confirm the total number for the household.

Panel members also noted that Nuiqsut caribou hunting activities are often shared between hunters; in other words, while one hunter may shoot a caribou, the other hunters in that boat who assist with navigating to the hunting area, spotting the caribou, retrieving the caribou, butchering the caribou, and receiving a share of the caribou, may also perceive that they have "harvested" that caribou. The study team has also noted this during their active harvester interviews, with two respondents sometimes reporting the same caribou harvest. During household harvest surveys, researchers focused the respondents on reporting the number "shot" by household members in order to reduce duplicate reporting.

Respondent Selection Process

Active Harvester Interviews

In order to collect accurate data for the Year 3 caribou hunting season, it was necessary to interview currently active caribou harvesters. All hunters interviewed in Year 1 (for the 2008 hunting season), and Year 2 (for the 2009 hunting season) were included in the Year 3 sample. The study team attempted contact with all Year 1 and Year 2 respondents with the goal of achieving consistency between study years. As anticipated, not all Year 1 and Year 2 respondents were available to participate in Year 3 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 relatively large sample of Nuiqsut caribou harvesters, the study contacted additional harvesters, who were identified using active harvester nominations, panel nominations, and additional information (e.g., suggestions from KSOPI employees).

In some cases, residents who were not on the study team's list of potential respondents requested an interview. After confirming that the individual had hunted caribou during the Year 3 hunting season, fieldworkers recorded these individuals' names and contact information and agreed to contact them to schedule an interview if time allowed. If the fieldworkers 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. Fieldworkers found that these "walk-in" respondents were often active hunters and harvesters who provided informative and thorough interviews.

Household Caribou Harvest Surveys

SRB&A had previously obtained a household list from the City of Nuiqsut, which reported 123 residences within the city limits. The study team identified one additional residence with the assistance of the local liaison and NSB subsistence specialist, bringing the total number of households in Nuiqsut to 124. The household list included both occupied and unoccupied houses. The 2010 Census documented 114 occupied residences within Nuiqsut, which included seasonally occupied residences such as those reserved for teachers (U.S. Census Bureau, 2011b). 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 (2010), and were occupied year-round, thereby excluding seasonal workers and teachers who left the community during the summer months. By working with a local liaison and the NSB Subsistence Specialist, SRB&A developed a list of 93 eligible households, which was used to conduct the household surveys (see below under "Fieldwork Summary"). The household list that was developed by SRB&A, the local liaison, and the NSB subsistence specialist included all households that were permanently occupied during the 2010 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 residence of the respondent or 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.

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 of the responses of the respondents and probes by the interviewer using a laptop computer.

Interviewers recorded each mapped feature as a polygon, line, or point. Caribou hunting areas were recorded as polygons, and harvest locations were recorded as points. 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 three instances, study team members conducted interviews with two or three 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. Some respondents chose to decline the honorarium.

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 two times to conduct Year 3 active harvester interviews in November 2010. As shown in Table 1, SRB&A researchers interviewed 60 Nuiqsut residents. Two of these respondents were elders who had not participated in caribou hunting activities during the Year 3 study period but provided observations about long-term changes. One respondent was relatively new to the community and unable to identify his use areas on a map. Over the three study years, SRB&A developed a list of 117 active caribou harvesters in Nuiqsut (Table 1), who include all residents interviewed and/or identified as active harvesters during Years 1, 2, and 3. Three individuals were removed from the active harvester list in Year 3; two had passed away and the third requested to be removed from the list. Table 1 depicts the number of persons eligible for interviews in Year 3. A person was not eligible for an interview if he or she did not go caribou hunting during Year 3, 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 knowledge about long-term changes. During Year 3, 102 of the 117 active harvesters were eligible for an interview.

Table 1: Fieldwork Summary, Year 3

# of Occupied Households (2010) [1]	Population (2010)[1]	# of Persons Identified for Interviews	# of Persons Eligible for Interviews	# (%) of Eligible Respondents Interviewed	% of Respondents Interviewed in either Year 1 or Year 2 and Year 3	% of Respondents Interviewed in Year 1, Year 2 and Year 3	Number of Interview Workshops	Number of Interview Trips to Community
114	402	117	102	60 (59%)	68%	31%	56	2
U.S. Census Bureau, 2011a Stephen R. Braund & Associates, 2012								

SRB&A interviewed 60 individuals, or 59 percent of those eligible for interviews. These 60 respondents included 31 percent (19 persons) of the individuals who were interviewed during both Year 1 and Year 2, and 68 percent (41 persons) of the individuals who were interviewed in either Year 1 or Year 2.

The following tables (Tables 2 through 5) show descriptive data for the 60 Year 3 respondents, the 54 Year 2 respondents and the 40 Year 1 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.

Table 2: Respondents' Residence at Time of Birth

	Year 1	Year 2	Year 3
Nuiqsut	29%	40%	31%
Other North Slope Community	60%	49%	50%
Elsewhere in Alaska	9%	8%	14%
Outside Alaska	3%	4%	5%
Total	100%	100%	100%
Number of respondents	35	53	58

Stephen R. Braund & Associates, 2012.

Table 3: Decade Born

	Year 1	Year 2	Year 3
1940s	6%	10%	0%
1950s	17%	12%	16%
1960s	31%	17%	28%
1970s	20%	17%	16%
1980s	20%	31%	25%
1990s	6%	13%	16%
Total	100%	100%	100%
Number of respondents	35	52	57

Stephen R. Braund & Associates, 2012.

Table 4: Years of Residence in Nuiqsut

	Year 1	Year 2	Year 3
5 years or less	6%	2%	3%
6-10 years	3%	6%	5%
11-19 years	11%	19%	16%
20 plus years	80%	74%	76%
Total	100%	100%	100%
Number of respondents	35	53	58

Stephen R. Braund & Associates, 2012.

Table 5: Respondent Gender

	Year 1	Year 2	Year 3
Female	3%	9%	3%
Male	97%	91%	97%
Total	100%	100%	100%
Number of respondents	37	54	60

Stephen R. Braund & Associates, 2012.

Residence at birth[1], birth date, and years of residence were gathered for 35, 53, and 60 of the active harvesters interviewed in Year 1, Year 2, and Year 3, respectively. Over 80 percent of the Nuiqsut harvesters interviewed in Year 1, Year 2 and Year 3 were born on the North Slope (Table 2). A larger percentage of those interviewed in Years 2 and 3 were born in the 1980s and 1990s than those interviewed in Year 1 (Table 3). The large majority (80 percent in Year 1, 74 percent in Year 2 and 76 percent in Year 3,) of respondents have resided in Nuiqsut for 20 or more years (Table 4). The majority of active harvester respondents have been male. A slightly higher percentage of Year 2 respondents were female (nine percent) compared to Years 1 and 3 (three percent) (Table 5).

As stated above, the study team attempted to interview all respondents from Year 1 and Year 2 again in Year 3. Eighteen respondents have been interviewed in all three years of the study. Twenty-six additional respondents were interviewed in two of the three study years. The Year 3 sample also included twenty respondents not interviewed in either Year 1 or Year 2. Differences in the makeup of the three samples could potentially account for observed differences in results between the three years. 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. We can therefore be confident that the results shown for the entire sample in each year is 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 2010 year by Nuiqsut residents and were still occupied during the period in which the survey was implemented. Out of the 124 residences on the household list for Year 3, five were not occupied in 2010, two were offices rather than residences, nine were seasonally occupied residences, and 15 were vacant at the time of the surveys. Therefore, the total number of eligible households for the Year 3 household surveys was 93.

The study team aimed to achieve a minimum response rate of 80 percent (74.4 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 78 (84%) household surveys in the community of Nuiqsut (Table 6). Of the households not surveyed, three households were too busy, two declined to participate, and the remaining 10 households were otherwise unavailable.

[1] Interviewers gathered residence at birth rather than birth place to avoid incorrectly recording the locations of birth hospitals (e.g., Anchorage, Fairbanks).

Table 6: Nuiqsut List of Occupied Households, 2010

Type of Household	Number of Households
Original Household List	124
Not In Residence 2010	5
Office, Not Residence	2
Seasonally Occupied Residences	9
Confirmed Vacant	15
Total Eligible Households	**93**
Surveyed Households (% of Eligible Households)	**78 (84%)**

Stephen R. Braund & Associates, 2012.

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 type of abnormality reported by respondents, as collected in Section B of the field protocol ("Assessment of Harvested Caribou"). Associated feature codes are included for each record. The study team coded each response so that the data could later be queried.

- 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.
- Mitigation Table – This table contains one record per respondent who assessed each of eight specific mitigation actions. These data were collected in Section C of the field protocol ("Impacts on Caribou Hunting").

The resulting database contains seven data sets. The number of records in each data set for the three study years is shown in Table 7. 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 7: Nuiqsut Datasets

Nuiqsut Dataset Component	# of Records		
	Year 1	Year 2	Year 3
Respondent characteristics (age, residence duration, place of birth)	37	54	60
Subsistence use areas	136	186	215
Harvest locations	181	152	196
Observations of changes in harvest patterns	35	50	48
Observations of changes in condition of caribou	45	28	32
Impacts on harvest activities	55	93	60
Mitigation of impacts	27	46	59
Number of Respondents	37	54	60

Stephen R. Braund & Associates, 2012

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 D provides codes used in the Year 3 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 215 Year 3 use areas and 196 Year 3 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 seven related tables, which are described above ("Data Entry"): (1) Respondent; (2) Harvest Area; (3) Harvest Location; (4) Harvest Activity Assessment; (5) Harvested Caribou Assessment; (6) Hunting Impact; and, (7) Mitigation. 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 3 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 3 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 4. 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 5), 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

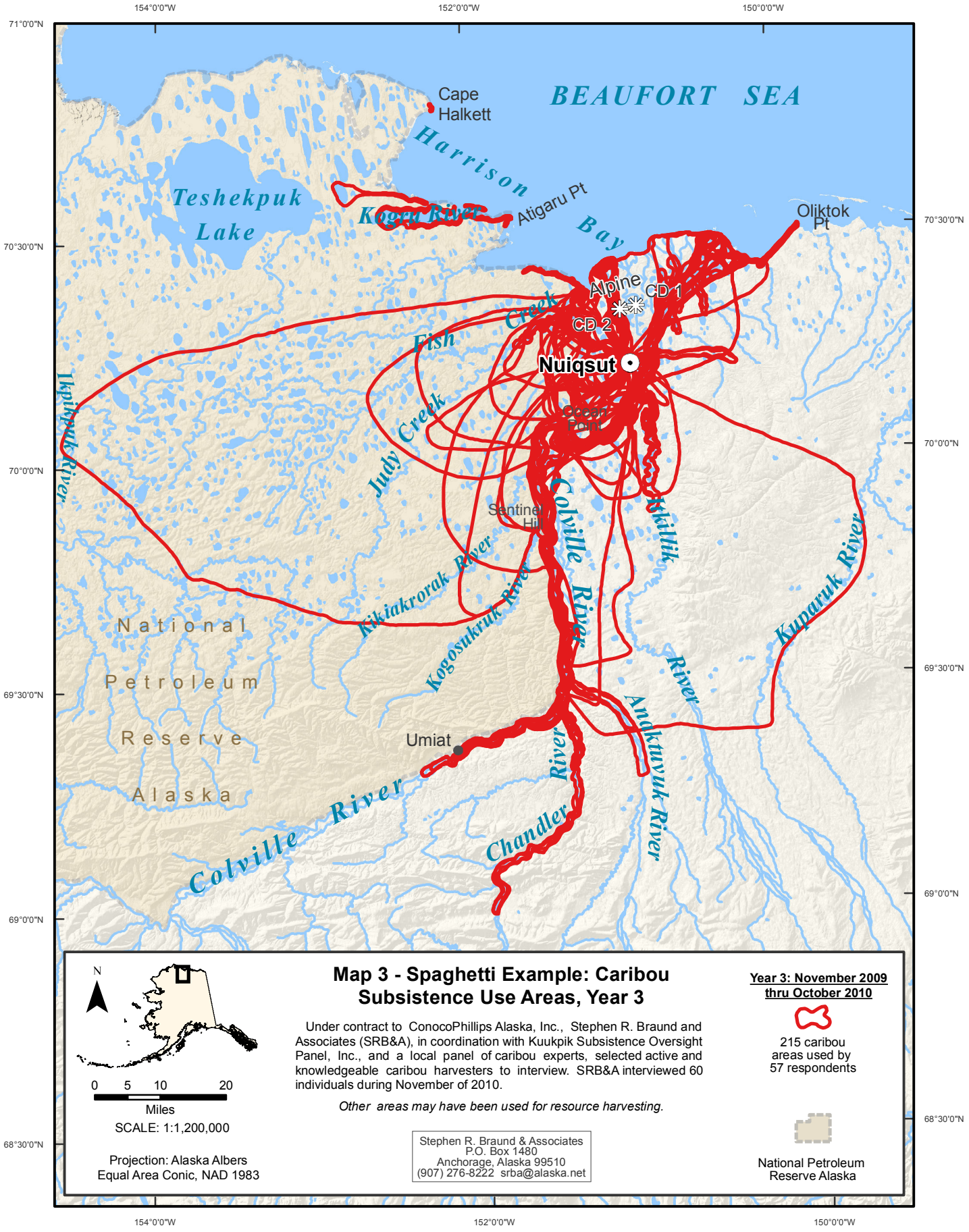
Similar to the data analysis steps for the active harvester interviews, the study team entered the data from each household harvest survey form into an Access database developed by the study team, and used Stat Transfer to convert the Access tables to SPSS for analysis. To create a community harvest 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 (93) by the number of sampled households (78). The study team operated under the assumption that the 15 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). During the NSB review meeting in Barrow, several meeting attendees asked about this conversion factor and expressed concern that 117 pounds seemed high. The study team followed up on this comment during the May 1 caribou panel meeting in Nuiqsut. Panel members believed that the conversion factor may be low rather than high, and noted that Nuiqsut residents use not only the meat of the caribou, but the heart, head, stomach, brains, bones (for marrow and for use in soups), and skin (for clothing and crafts). They suggested that the study team conduct their own analysis to determine the average pounds per caribou used by Nuiqsut residents. For the purposes of the Year 3 report, the study team retained the conversion rate of 117 pounds per caribou.

Data Review

For each study year, the study team provides CPAI, the Nuiqsut caribou panel, KSOPI, and the NSB with copies of the draft report for review. Review meetings are scheduled with the NSB and the Nuiqsut caribou panel, during which the results of the monitoring project are presented. The study team revises the report based on comments and feedback, and then finalizes the report.

The draft report for Year 3 was submitted to CPAI in February 2012, and CPAI provided comments on the Year 3 report in March 2012. The study team addressed CPAI's comments and sent the updated draft report to each member of the Nuiqsut Caribou Panel and to KSOPI in March for review. CPAI also sent copies of the draft report to the North Slope Borough. SRB&A attended a review meeting with CPAI, ABR, Inc., and the NSB on April 9, 2012 at the North Slope Borough Department of Wildlife in Barrow. At this meeting, SRB&A presented the results of the Year 3 Draft Report. NSB reviewers provided comments at the review meeting, which resulted in several edits to the report primarily for clarification of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Teshekpuk Lake
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CD 2
Nuiqsut
Fish Creek
Judy Creek
Ikpikpuk River
Colville River
Itkillik
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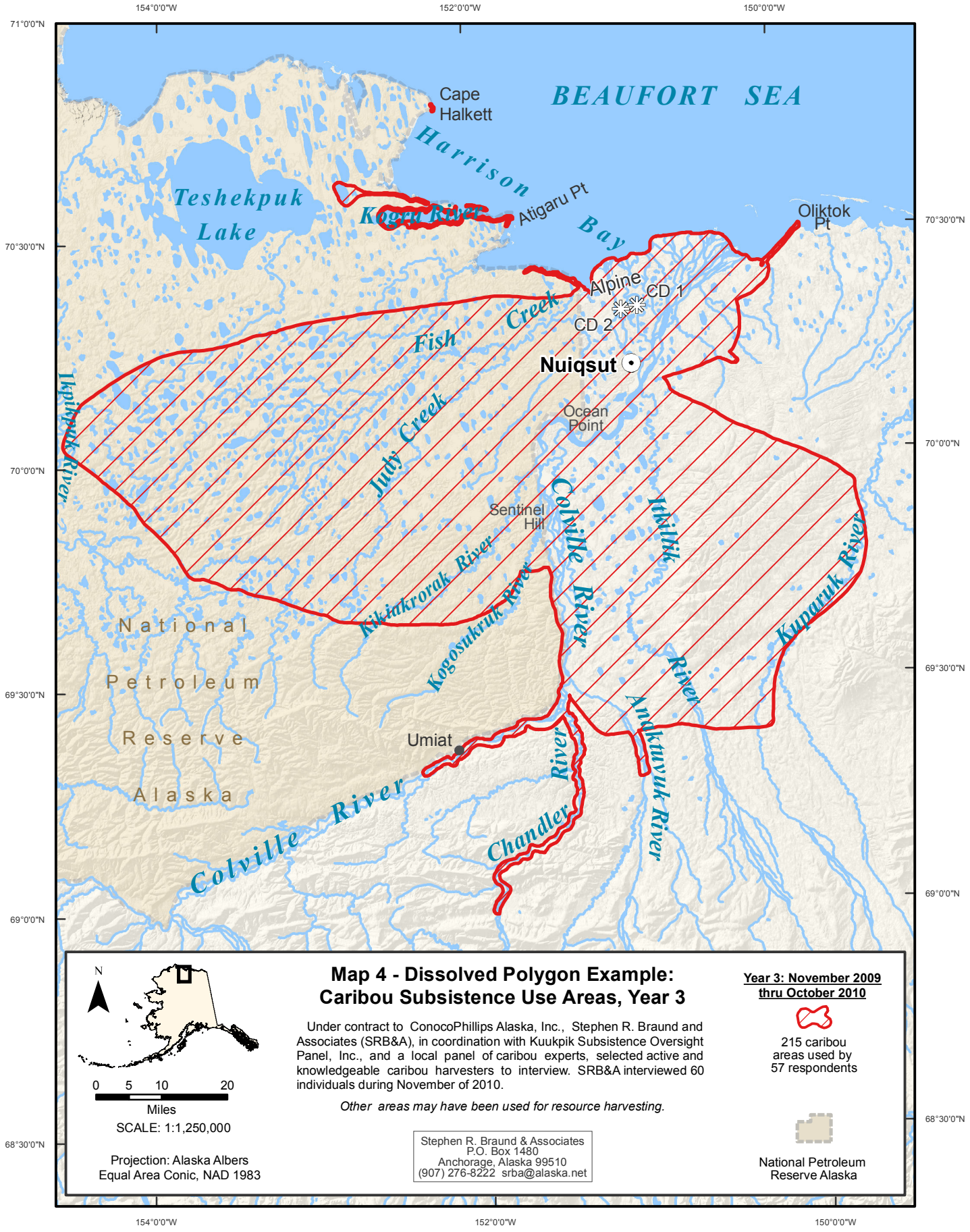
Map 3 - Spaghetti Example: Caribou Subsistence Use Areas, Year 3
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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 3: November 2009 thru October 2010
215 caribou areas used by 57 respondents
National Petroleum Reserve Alaska



Map 4 - Dissolved Polygon Example: Caribou Subsistence Use Areas, Year 3

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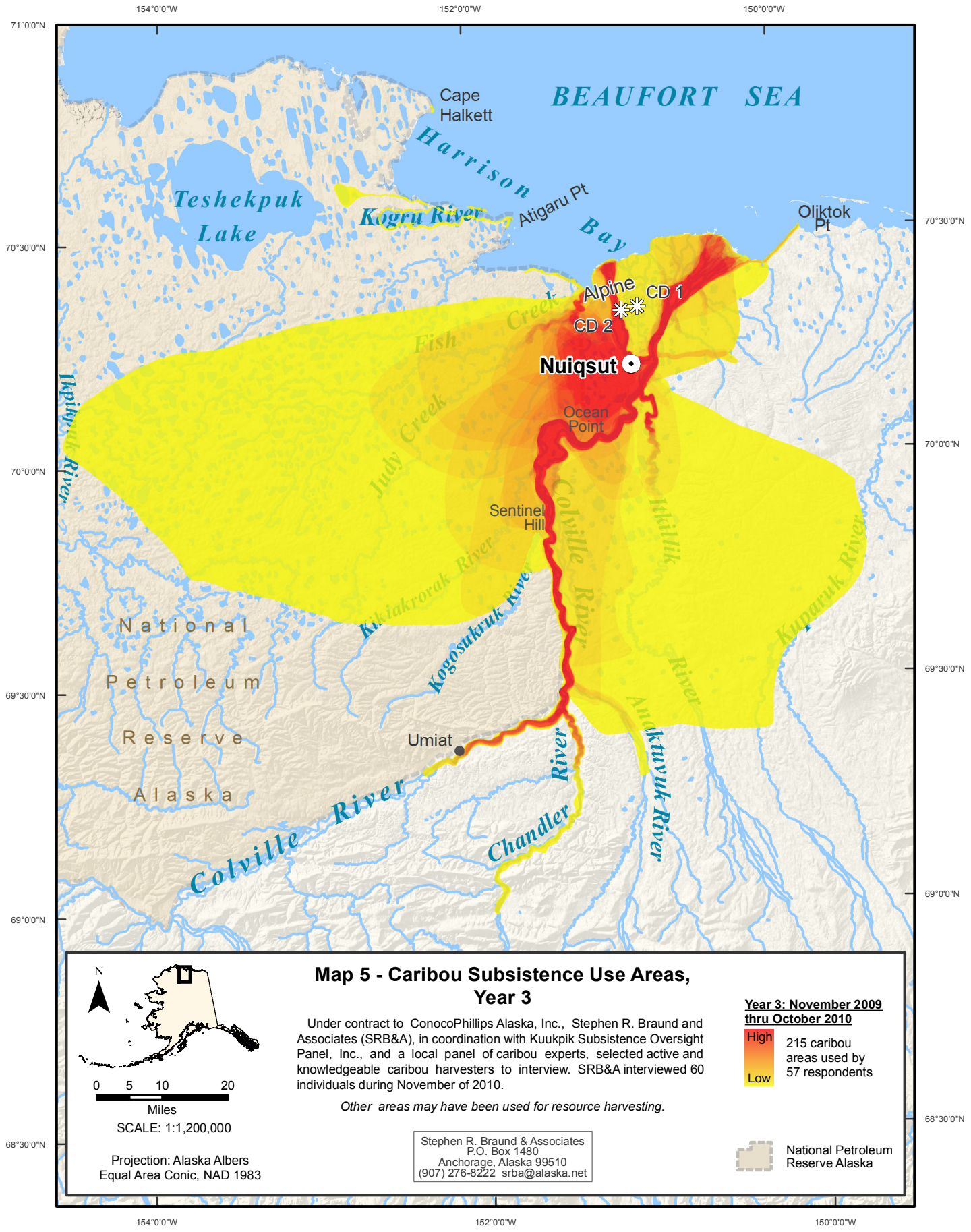
National Petroleum Reserve Alaska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Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Nuiqsut
Fish Creek
Judy Creek
Ocean Point
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik
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Map 5 - Caribou Subsistence Use Areas, Year 3
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 60 individuals during November of 2010.
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Year 3: November 2009 thru October 2010
High
Low
215 caribou areas used by 57 respondents
National Petroleum Reserve Alaska

tables and text. Reviewers also provided several suggestions for future monitoring activities, including comparison of data on CPAI helicopter and plane activity with respondent reports of impacts.

The study team traveled to Nuiqsut and met with the Nuiqsut Caribou Panel on May 1, 2012. Four panel members attended the draft review meeting. Panel members at both meetings provided insight into Year 3 results and provided suggestions for how the monitoring program could be improved in future study years. Comments relevant to the Year 3 results have been incorporated into the report where applicable.

Presentation of Interview Results

This report summarizes the results of the active harvester interviews using the verbatim (as close as possible) 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.

CARIBOU USE AREAS

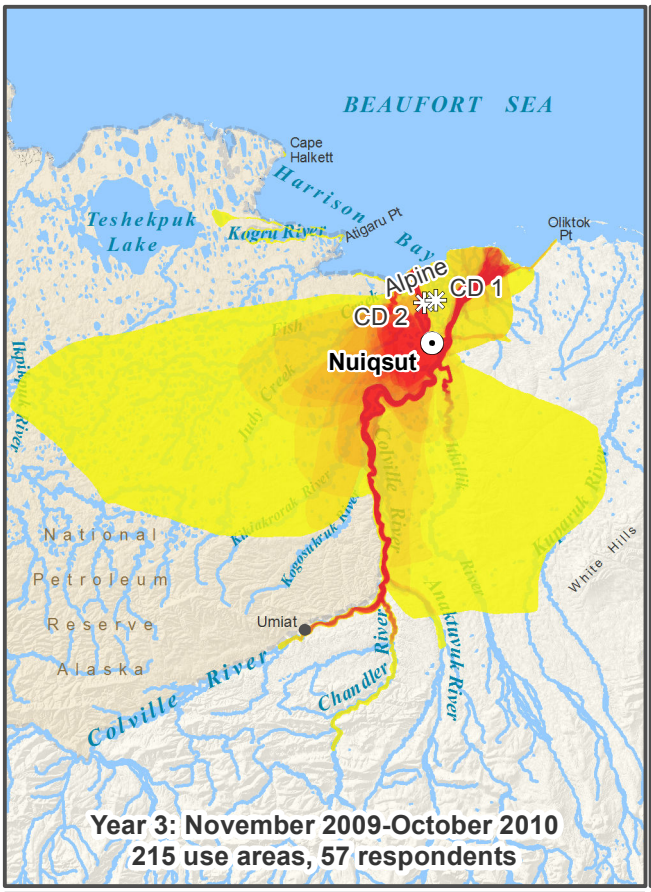
Nuiqsut respondents reported 215 caribou use areas for the Year 3 study period. The locations and characteristics of Year 3 caribou use areas are described below.

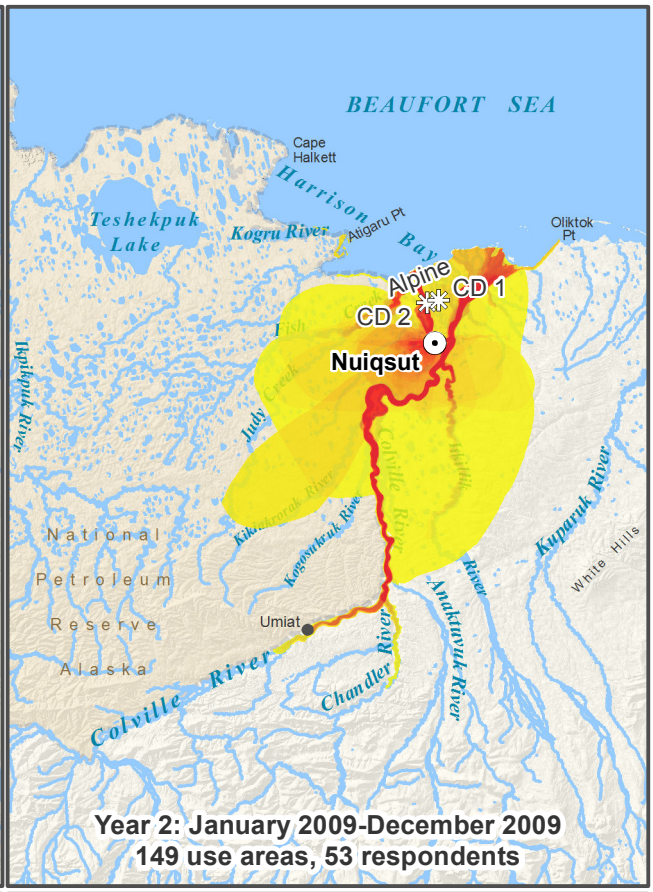
Location of Caribou Use Areas

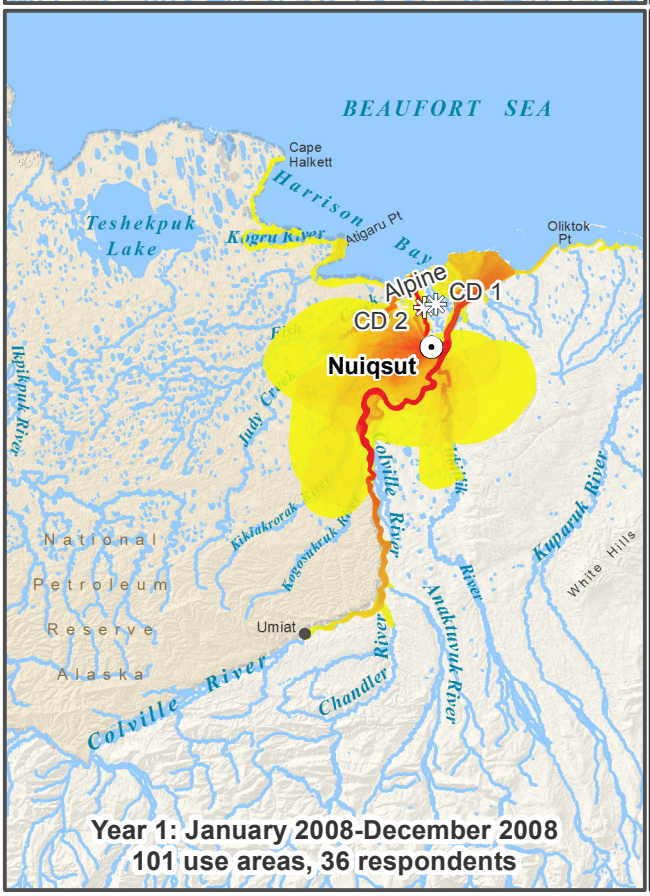
Nuiqsut Year 3 caribou use areas, as reported by 60 Nuiqsut respondents, are depicted on Map 5. Year 1, Year 2, and Year 3 caribou use areas are depicted side by side on Map 6. As shown on Map 5, caribou harvester respondents reported traveling along local rivers, in the ocean along the coast of the Beaufort Sea, and overland both west and east of the community, in search of caribou during the Year 3 time period (November 2009 through October 2010). Residents' riverine travel extended beyond Umiat along the Colville River as well as along Fish Creek, Itkillik River, and substantial distances along the Chandler and Anaktuvuk rivers. Hunters traveled along the coast east of the community to Oliktok Point and west of the community to Kogru River and Cape Halkett. Overland travel extended west to Ikpikpuk River and east to Kuparuk River. The highest numbers of overlapping caribou use areas in Year 3 occur along Nigliq Channel, Colville River to the mouth of Chandler River, along the lower portions of the Itkillik River and Fish Creek, and overland in an area west of the community toward Fish Creek and Ocean Point.

Compared to Year 1 and Year 2, Year 3 use areas extend farther overland and upriver and show heavier overlap west of the community, along the Colville River south of the community toward Umiat, and along the Chandler River. Year 2 and Year 3 use areas show more similarities than Year 1 and Year 3. Other factors affect the distance traveled each year and 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. Map 7 depicts all three study years (1, 2, and 3) combined. The highest numbers of overlapping use areas occur along the Colville River (including the Nigliq Channel and East Channel) as far as the mouth of Chandler River, along the Iktillik River and Fish Creek, and in an overland area between the community, Fish Creek, and Ocean Point. Maps 8 through 10 depict Nuiqsut caribou use areas by mode of transportation (boat, snowmachine, and four-wheeler/truck).

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) (Map 8). The highest numbers of overlapping boat use areas occur along the Nigliq Channel to the Nigliq Camp area, and upriver to Sentinel Hill, with moderate overlaps occurring as far as the mouth of the Chandler River and along the lower portion of the East Channel of the Colville River. Compared to previous study years, residents reported traveling farther along the Anaktuvuk and Chandler rivers and shorter distances along the Itkillik River and Fish Creek. Coastal hunting activities were more limited in Year 3 compared to previous years (Map 8).







Map 6
Caribou Subsistence Use Areas, Year 1, Year 2, Year 3

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Other areas may have been used for resource harvesting.

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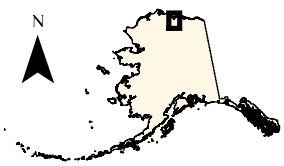
LEGEND

Overlapping Polygons

High

Low

National Petroleum Reserve Alaska



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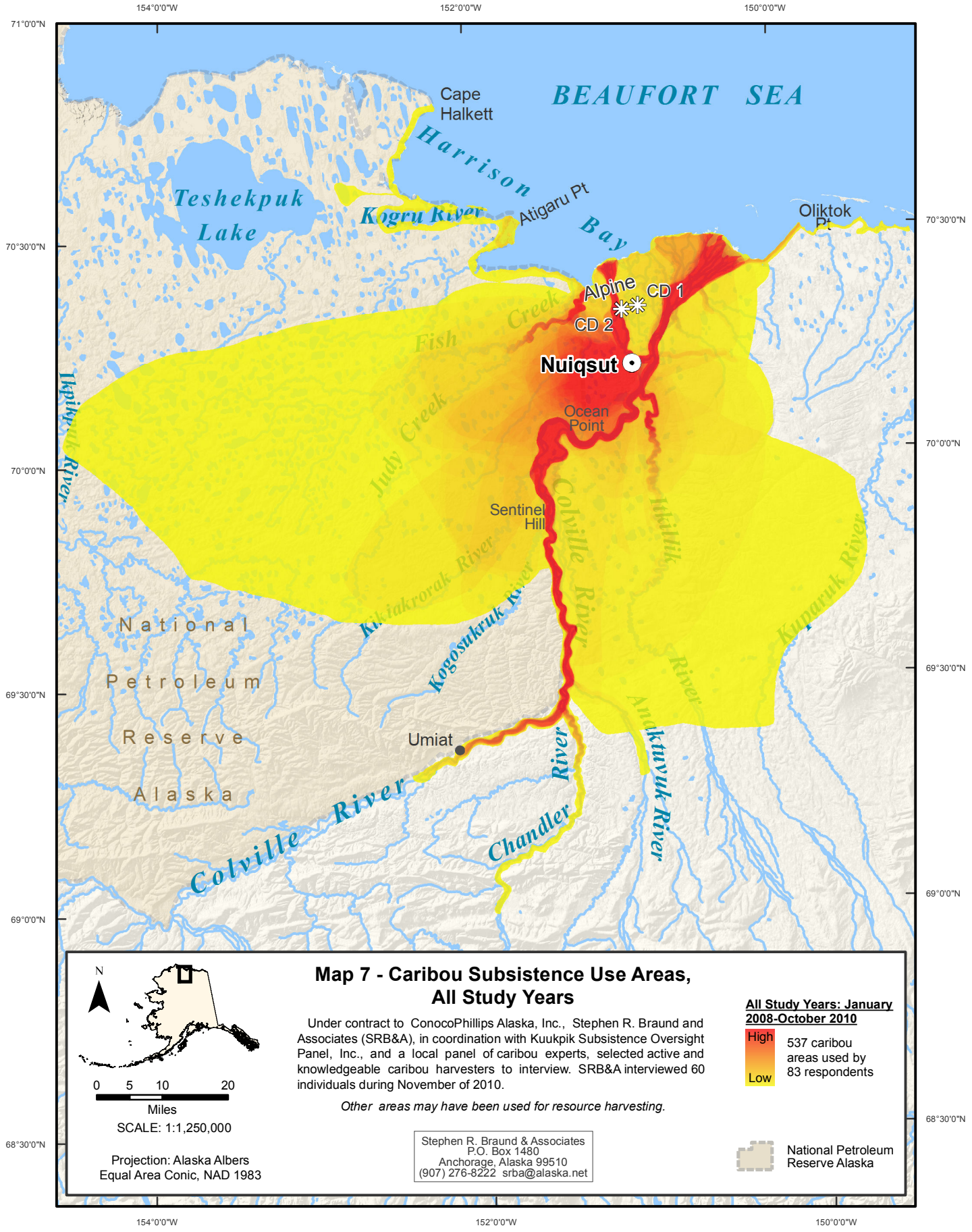
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Teshekpuk Lake
Kogru River
Alpine
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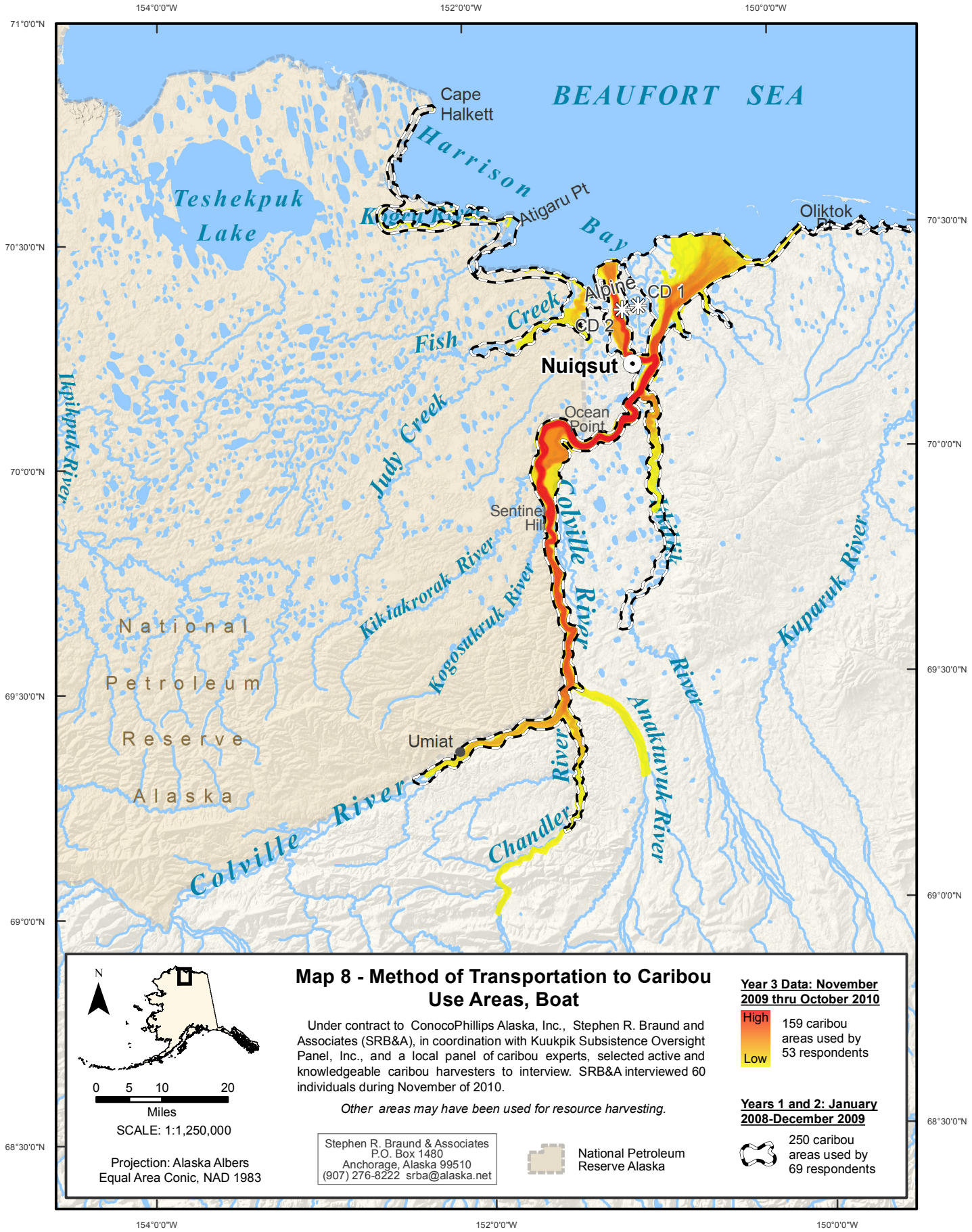
CD 2
Nuiqsut
Fish Creek
Judy Creek
Ocean Point
Sentinel Hill
Colville River
Itkillik
Kuparuk River
Ikpikpuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Chandler River
Anaktuvuk River
Colville River
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 7 - Caribou Subsistence Use Areas, All Study 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 60 individuals during November of 2010.
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
All Study Years: January 2008-October 2010
High
Low
537 caribou areas used by 83 respondents
National Petroleum Reserve Alaska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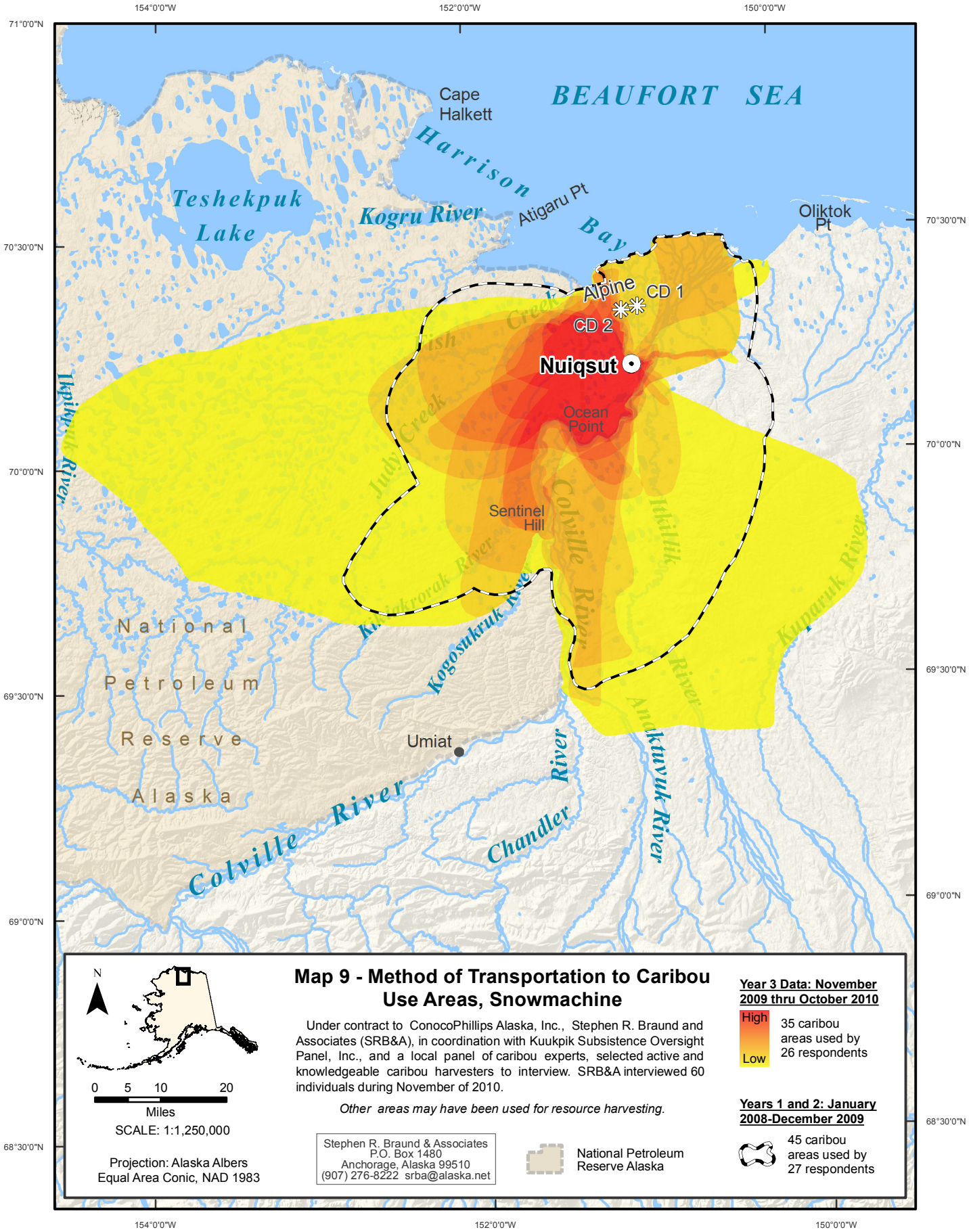
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Alpine
CD 1
CD 2
Fish Creek
Nuiqsut
Ocean Point
Judy Creek
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik River
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Anaktuvuk River
Chandler River
Colville River
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 8 - Method of Transportation to Caribou Use Areas, Boat
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009 thru October 2010
High
Low
159 caribou areas used by 53 respondents
Years 1 and 2: January 2008-December 2009
250 caribou areas used by 69 respondents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Alpine
CD 1
CD 2
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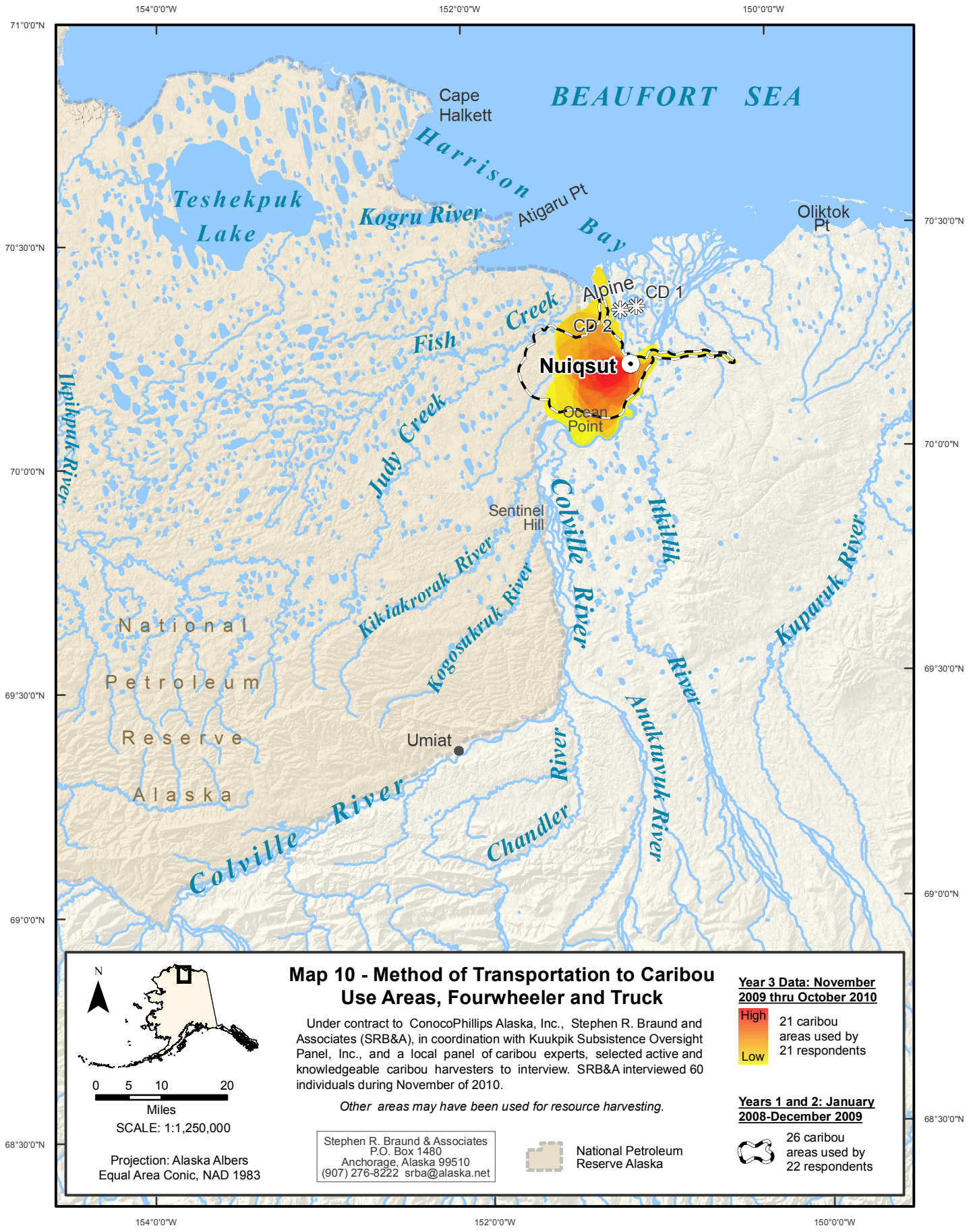
Sentinel Hill
Judy Creek
Colville River
Itkillik
Kuparuk River
Kogosukruk River
Umiat
Chandler River
Anaktuvuk River
Ikpikpuk River
National Petroleum Reserve Alaska
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 9 - Method of Transportation to Caribou Use Areas, Snowmachine
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009 thru October 2010
High
Low
35 caribou areas used by 26 respondents
Years 1 and 2: January 2008-December 2009
45 caribou areas used by 27 respondents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68°30'0"N
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine CD 1
CD 2
Nuiqsut
Ocean Point
Fish Creek
Judy Creek
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik River
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Anaktuvuk River
Chandler River
Colville River
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0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 10 - Method of Transportation to Caribou Use Areas, Fourwheeler and Truck
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009 thru October 2010
High
Low
21 caribou areas used by 21 respondents
Years 1 and 2: January 2008-December 2009
26 caribou areas used by 22 respondents

The distance residents travel along the Colville River each year depends on their hunting success, locations of camping spots or cabins, water levels, and coinciding subsistence activities such as moose hunting (which generally takes place farther upriver) and seal hunting (which occurs in the ocean). Residents frequently travel along Nigliq Channel throughout the summer months to hunt for caribou, to travel to and from fishing nets or camps, and on their way to and from the ocean where they hunt for seals, caribou, and eiders. Residents often stay at cabins or camps on Nigliq Channel while tending their nets and waiting for the caribou to cross. Several individuals described hunting for caribou along Nigliq Channel as follows:

> *June 23 and 24, before we had the Nalukataq celebration, we got four caribous just across from Nanuq [Lake]. Just across. There were four caribous by the river that we harvested. That was for the celebration so it was shared with everybody. It was all cooked for the feast. Young bull, maybe a couple of females. The majority of the trips I make, I come out through Nigliq [and go] east and head east towards the island, and I will come in through Colville [East Channel] and see if I can see any caribou that way.* (SRB&A Nuiqsut Interview November 2010)

> *There's a cabin at Nigliq that we like to go to. I think on one of those trips we got like three caribou. That was in July. It was all summer long, maybe 10 or 12 times. [We got them] when they were running through. Yeah, during the whole summer we were fishing and always looking up and down the river.* (SRB&A Nuiqsut Interview November 2010)

> *[I went hunting] mostly at Nigliq. I was there three day's straight. I didn't go in the ocean at all. Me, I was just helping at the cabins with the fishes and stuff. I was pretty much waiting for the caribou to cross cause they usually do. You catch a caribou right by those lakes there. There's [oil] drums and stuff there. Just a little past Nigliq.* (SRB&A Nuiqsut Interview November 2010)

Respondents described looking for caribou while on their way to or coming back from the ocean, where they hunt seals during the early summer months; a small number of hunters also scouted for caribou along the coast during these trips. Fish Creek is also a relatively common caribou hunting destination and trips to Fish Creek are sometimes (but not always) combined with ocean hunting trips. Year 3 coastal caribou hunting activities occurred both west and east of the Colville River and included areas surrounding Cape Halkett, Atigaru Point, Kogru River, and Oliktok Point. The coastal area between the mouth of the Colville River and Oliktok Point show higher numbers of overlaps than other coastal hunting areas. One individual reported hunting for caribou in coastal areas west of the community as well as in Fish Creek. He said,

> *It [caribou hunting] was all in a boat. Mostly on the west side for the duration of the summer. We were up on Eskimo Island and the Cape [Halkett]…. I went scouting at the same time going in and out of Fish Creek. We were looking out for seals and at the same time we didn't see any at Fish Creek. None seem to be in that area this summer. [We looked] at the points [Atigaru Point, Cape Halkett] and along the mainland. The island itself is six miles from the main area. That's all a sand bar. The mainland is split up over the duration of the year. Part of that is beginning to become an island out there. We look along and scout along and didn't see anything. And we went back out. I even went all the way inside this bay here until I got to the real shallow part. So those are the areas that we scouted at the same time as our seal hunt. We checked out that way and there was absolutely no caribou to the west. [We go in] July, as soon as you have access to go out to the ocean you can get to those places. About every weekend when you have access, weather permitting. Same time [to] Fish Creek. But this is the area [coastal area west of Colville River] that I have gone the distance. And normally I see a lot of caribou that way, but [there was] nothing more in that area.* (SRB&A Nuiqsut Interview November 2010)

In addition to hunting along Nigliq Channel, residents also reported traveling along the East Channel of the Colville River in search of caribou, sometimes when returning from seal hunting trips in the ocean. One individual described,

> *They [caribou] seemed to be farther east because on the east side somewhere around there it gets pretty shallow and you can't go [get them]. You can see them, but you can't get to them. I only go in and out if I don't get any seals; then I will come in and see if I can catch any caribou there on the way to the village.* (SRB&A Nuiqsut Interview November 2010*)*

Residents travel upriver throughout the summer to hunt caribou and, later in the season, moose. Nuiqsut harvesters generally report traveling upriver to specific destinations (e.g., Ocean Point, Sentinel Hill) until they are successful harvesting caribou, or until they are low on supplies and/or time. A number of residents described taking a small number of trips to the Itkillik River during the summer to look for caribou. Residents indicated that access along the Itkillik River is sometimes limited due to low water levels, but a number of individuals indicated that they traveled as far as an old airstrip located along the river. Two individuals described,

> *We did go up [Itkillik] twice but didn't see anything. Nine times out of 10 we go and come back with caribou, but for some odd reason they were either too far inland or we couldn't get to them.* (SRB&A Nuiqsut Interview November 2010)

> *I started boating last June. June 23, I was going through Itkillik River. That's that old airport. I got two caribou. They were all over. Coming down that way. There was some caribou coming down.* (SRB&A Nuiqsut Interview November 2010)

> *Just a little ways [into Itkillik River], it was kind of shallow. Only early in the spring I do [that] when the river's high. Let's say up the old airport, didn't catch anything there (June). [I go there] only a couple of times the whole summer.* (SRB&A Nuiqsut Interview November 2010)

> *I did [Itkillik River] once on a fan boat, and that was really cool. There was a horseshoe that was right here. That was the farthest I have ever been up that river. It was the only way we could do it [with a fanboat]. That was in July. That was a onetime thing on the fan boat, but we did catch caribou.* (SRB&A Nuiqsut Interview November 2010)

A number of harvester respondents reported traveling as far as the Ocean Point area, including *Qitik* (upriver from Ocean Point) and *Kayuktisiluk* (downriver from Ocean Point) looking for caribou during Year 3. Residents also frequently traveled farther, to the Sentinel Hill area (including areas referred to as *Ulusrak* and *Umirak*). Two individuals noted regular crossing locations for the caribou in these areas, saying,

> *A lot of times I also watch at Sentinel Hill, and I notice that the caribou is kind of on this side (west). The same thing right here, there's always caribou here on this side (west). A lot of times when we don't get caribou I will park my boat and wait. Ocean Point is another crossing area for caribous. It seems like they always go to the valleys when there's a real thick bluff. Umirak and Ocean Point in particular; my observations [are] at Ocean Point, Kikiakrorak, and Ulusrak I'll go wait. And when we absolutely can't find anything, I'll go at any time of the summer.* (SRB&A Nuiqsut Interview November 2010)

> *Somewhere down below on the south side of Ocean Point they seem to have a trail that's going across east and west somewhere there, somewhere up here they have been going criss-cross. And a lot of time you see about 30 [in a] herd sitting there at the point of the sandbar.* (SRB&A Nuiqsut Interview November 2010)

A number of Nuiqsut respondents reported traveling beyond Sentinel Hill to the Chandler River and Umiat areas, particularly during the moose hunting season in August and September. Residents indicated that, when the season is open, moose is their main priority; however, they harvest caribou as needed, when moose are unavailable, or when the moose hunting season is closed. Several individuals reported traveling substantial distances along the Chandler and Anaktuvuk rivers in Year 3 due to adequate water levels for boat travel; however, others indicated that both rivers were too shallow for access. This

difference could be due to differences in transportation (e.g., some individuals have boats that require higher water levels to operate) or differences in the timing of the subsistence activities. Nuiqsut harvesters described their Year 3 caribou hunting activities in these areas as follows:

> *We went upriver like all the way to in between Anaktuvuk and Chandler, that's where we got that one caribou, right in between Anaktuvuk and Chandler. It was on this side (west). Right in the first part of Chandler. Cause we were doing some moose hunting, and we didn't see any so we ended up catching the caribou. There was one or two right there.* (SRB&A Nuiqsut Interview November 2010)

> *We were actually about 40 or 50 miles inside Chandler. We passed the camera; we passed some trees. We went way up there this year; it was the farthest I've ever been up. It was really deep in the river this year. I went 20 miles up the Anaktuvuk too.* (SRB&A Nuiqsut Interview November 2010)

> *I've gone as far as Umiat. Yeah, I want to say about, maybe 10 miles in [to Chandler River]. Give or take. The river gets pretty shallow in that area. It can be pretty hard to get in. Oh no, I don't like to go through that area [shortcut], it's real shallow. Me and my cousin, we go as far up the river as we can during the moose season. It [Anaktuvuk River] is about the same as Chandler, about 10 miles. I got to see a whole lot of the inside of the river by chopper. I was surprised to see how many caribou were actually on top of the bluffs. They were all spread out.* (SRB&A Nuiqsut Interview November 2010)

> *During August we went all the way down here looking for caribou. About 40 miles after Chandler on the river, we started to see the hills. I think we caught two of them up on Chandler when we were camping with my parents. At the same time we were looking for a moose. About five miles from the mouth on the west side of the river. We ducked in Chandler, and the Anaktuvuk River was too shallow to go up. I [camped] three or four days right at the mouth of Chandler.* (SRB&A Nuiqsut Interview November 2010)

> *Yeah [I went upriver], near Chandler, to Umiat [looking for] moose. When we didn't catch any, we looked for caribou too. We tried to [go into Chandler], but it was too shallow. Yeah we did [get down by Umiat] maybe a couple turns from it. Saw a few caribous out there, but they were too far from the river. There's one part over on the river where we camp for the night and then start heading up again.* (SRB&A Nuiqsut Interview November 2010)

In addition to hunting for caribou by boat, Nuiqsut harvesters also travel by four-wheeler in the summer and fall months looking for caribou (Map 10). The majority of four-wheeler travel occurred west of the Colville River and Nigliq Channel, extending beyond Ublutuoch River (east of Fish Creek) in the west and Ocean Point in the south. Year 3 four-wheeler use areas were similar to previous years, but did not extend as far west to Fish Creek (Map 10). In some cases, residents reported traveling to fish net sites with their four-wheelers and looking for or harvesting caribou along the way. One individual described,

> *With a four wheeler, I went about this time of the year [November]. We were fishing and looking for caribou so it had to be about the end of October, beginning of November, but the snow started getting deep so we didn't go too far. I spotted caribou right by this lake, but the snow started getting deeper so I couldn't catch up to them.* (SRB&A Nuiqsut Interview November 2010)

Residents indicated that the caribou tend to gather west of the community, particularly during the late summer and early fall months and sometimes into the winter. When the caribou are reported to be present, residents generally do not travel farther than 10 to 15 miles from the village in search of them. Several individuals indicated that they did the majority of their hunting in Year 3 by four-wheeler because they did not have their own boat. Two respondents described,

> *And then from the middle of August and September I did all of my caribou hunting out there about 12 or 13 miles [from Nuiqsut] on four wheelers. We started and went up towards Fish Creek, basically around this area right here. Went to the cabins and all the way out this area is all the caribou hunting I did. We had to go to the other side [of the creek] to catch all the big ones. Only about a ¼ mile. I'd*

> *say we went in this area right here. That's where all the caribou were at.* (SRB&A Nuiqsut Interview November 2010)

> *I went out there with my four-wheeler and got a few out there. I reached that creek out there… no not that far! Just right here [Ublutuoch]. Sometimes I head down that way [toward Ocean Point] but [this year] I only got this far between these two [lakes]. It's pretty high ground, so I don't get stuck. When you approach them slow the way I go to catch my caribou with my four-wheeler, I don't go so quick. When the caribou looks at me I stop. And when I'm approaching them I get closer. And when they look up, I stop. And then I get my gun ready and shoot it. When I use my four-wheeler it is easier than the snowmachine.* (SRB&A Nuiqsut Interview November 2010)

Once snow conditions are adequate and are no longer conducive to four-wheeler travel (e.g., too deep), Nuiqsut hunters begin hunting for caribou with snowmachines in a larger area (Map 9). While the core hunting areas (e.g., those with higher overlaps) are within the extent of previous study years, one Nuiqsut hunter described traveling substantially greater distances west of the community to Ikpikpuk River, and another reported traveling beyond previous year extents in the east, as far as Kuparuk River. Several individuals indicated that there were few caribou in the area during the previous winter, which may explain why some of them traveled farther than usual in search of them. Two individuals observed,

> *It was last November. Caribou were so scarce last year. We pretty much were in this whole area. I went out here all over the place, got my wolves out here [Ikpikpuk]. Too much up and down over the rocks here. They were scarce last year; we had to go all over the place. Let's see… there's Kogosukruk right here, right? There's Judy Creek… I didn't go too far south, just right up here like this.* (SRB&A Nuiqsut Interview November 2010)

> *Last year I looked for caribou [in the winter], but no caribou. No caribou until June. At that valley that goes out by Umiat, that's where I went, close by; it's called Umirak. I went everywhere – I went to the foothills past east Kuparuk River. Then I crossed east and west Kuparuk. I went to east and west Kuparuk, east of the Kuparuk River. All the way out there. I cut across to the Itkillik River. And then [I hunted] nearby. First, I started going south straight past the Itkillik area. Then I went straight to Kuparuk River. I been driving long ways. I went maybe 20 or 30 miles. I cut across and then I went towards Chandler, and I followed the Colville back up.* (SRB&A Nuiqsut Interview November 2010)

Residents frequently described searching for caribou while also hunting for wolf and wolverine. In addition, a small number of respondents described hunting along the ice road east of the community, generally by truck or snowmachine (Maps 9 and 10). One reported spotting caribou while traveling along the ice road for work, then returning to the area to harvest them:

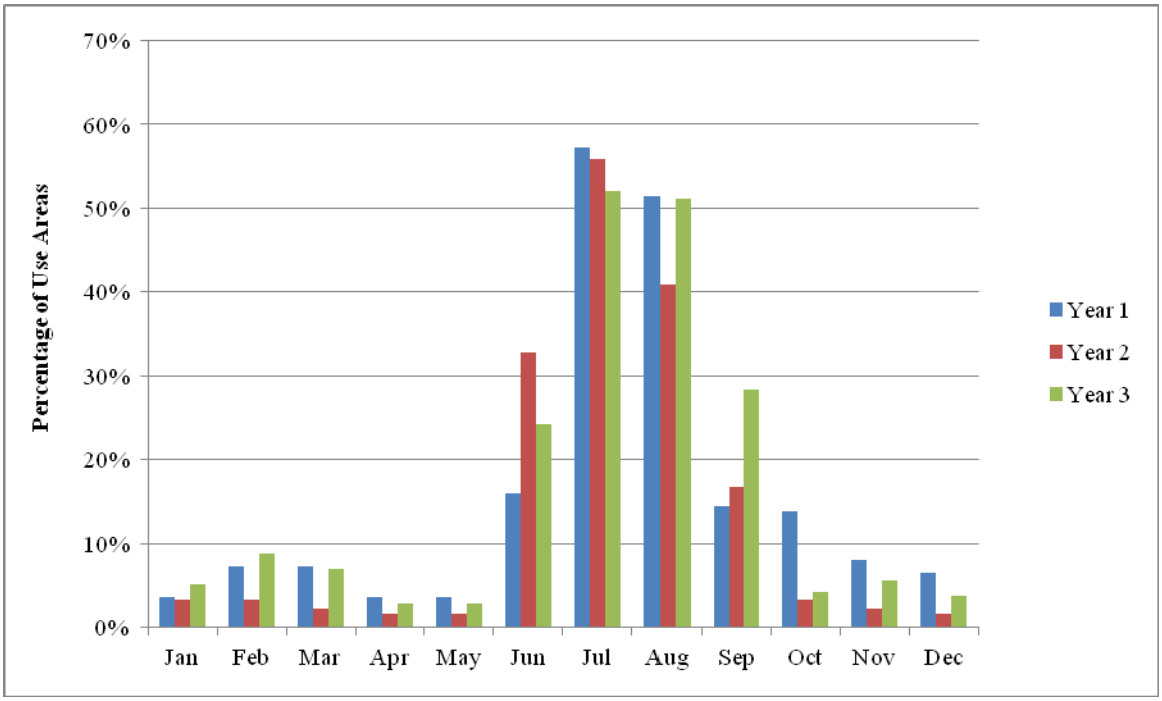
> *I went down the ice road trail and I ended up by Qaqimak, right where the [pipeline] crossing is. It was two one day and two the week after. They [caribou] were on both sides [of the pipeline]. It goes and goes around the sandbar and then it goes and goes around there. Actually I spot them with my truck, and then I go home and get my snow machine. They won't let me use the work truck. [I hunt for them] the whole ice road season, like November to April. [In] December, there was one female and three bulls. They were on the right side [including the first two I caught]. Every day [I looked for them]. I saw a couple more but they were smaller ones. They were migrating back and forth between the pipeline and this ridge and then back again. I saw a bunch of them over here.* (SRB&A Nuiqsut Interview November 2010)

Characteristics of Caribou Use Areas

Study participants characterized their Year 3 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 harvest month. As show in Figure 1, caribou harvest activities occurred in every month of the past reporting year, with the majority of use areas reported for the months of June through September (Figure 1). July and August were the principle harvest months in all three

years. September was a relatively more active harvest month in Year 3, with residents traveling to just under 30 percent of use areas during this month. Some harvesters cite preferences for caribou harvested a different times of the year, with residents indicating that the caribou are fatter in the late summer or early fall (August/September).

Figure 1: Nuiqsut Caribou Harvest Activity by Month, Years 1-3



Boats were the principal mode of travel in all three years, accounting for travel to between 70 and 80 percent of caribou use areas, followed by snowmachines, four-wheelers, and trucks (Figure 2). Figures 3 through 5 show the percentage of boat, snowmachine, and four-wheeler use areas reported by Nuiqsut harvester respondents by month. During all three study years, boat travel began in June as soon as the ice broke up and peaked in July, ending by November. Snowmachine travel began in September, extending through the months of April and May. Year 3 snowmachine use peaked in January, whereas in Year 1 it peaked in October.

Hunting by four-wheeler occurs throughout the summer, beginning in June, peaking in September, and ending by December. A higher percentage of four-wheeler use areas were reportedly accessed in June and November during the Year 3 interviews. Residents indicated that they begin traveling by four-wheeler as soon as the majority of the snow melts and stop traveling by four-wheeler once the snow is too deep, when they switch to snowmachines for the remainder of the winter. Respondents provided the following observations regarding the timing and method of transportation related to Year 3 caribou hunting:

> *We started [boating] after the ice broke up, about mid-June. I was looking from my Grandma's cabin at Itkillik, and I was waiting for the caribou to start coming up from Prudhoe.* (SRB&A Nuiqsut Interview November 2010)

> *[We travel by boat] starting in the end of June, right when it breaks up. Actually we were boating in October.* (SRB&A Nuiqsut Interview November 2010)

> *[We started four-wheeling in] maybe June, July, that's when all the snow was gone [and continued] until a month ago, in September for sure.* (SRB&A Nuiqsut Interview November 2010)

That [boating] was in July. It was all summer long, maybe 10 or 12 times, when they were running through. Yeah, during the whole summer we were fishing and always looking up and down the river. Beginning in June to August, beginning of September. (SRB&A Nuiqsut Interview November 2010)

Figure 2: Nuiqsut Caribou Harvest Activity by Travel Method, Year 1-3

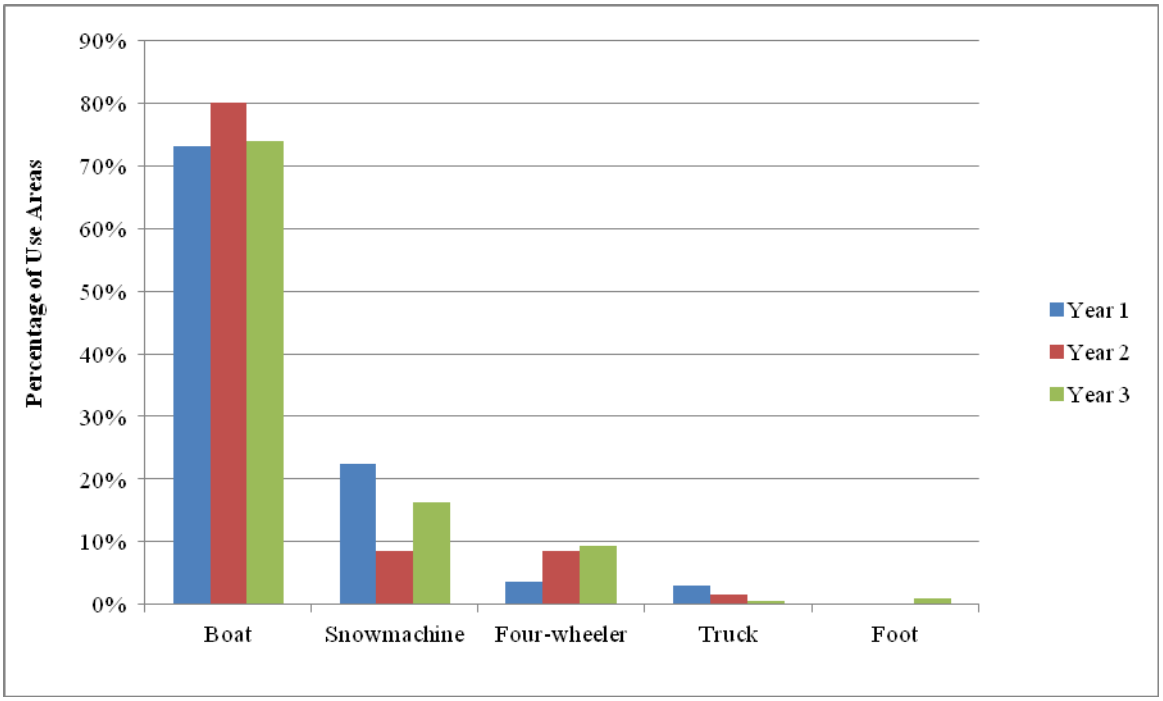


Figure 3: Boat Use by Month, Years 1-3

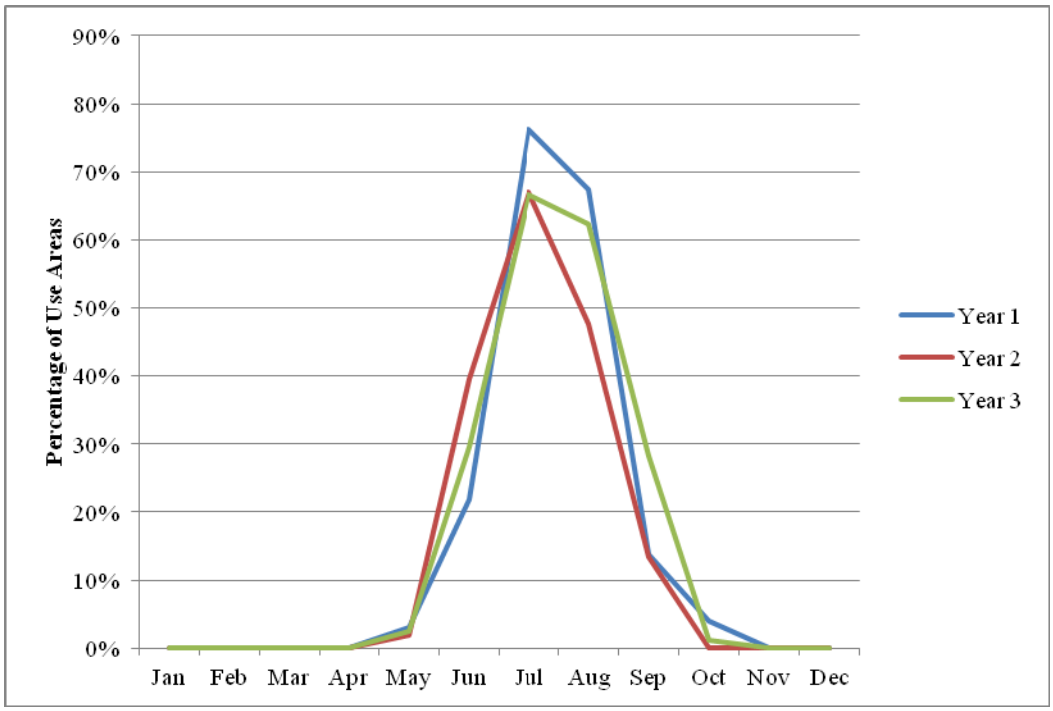


Figure 4: Snowmachine Use by Month, Years 1-3

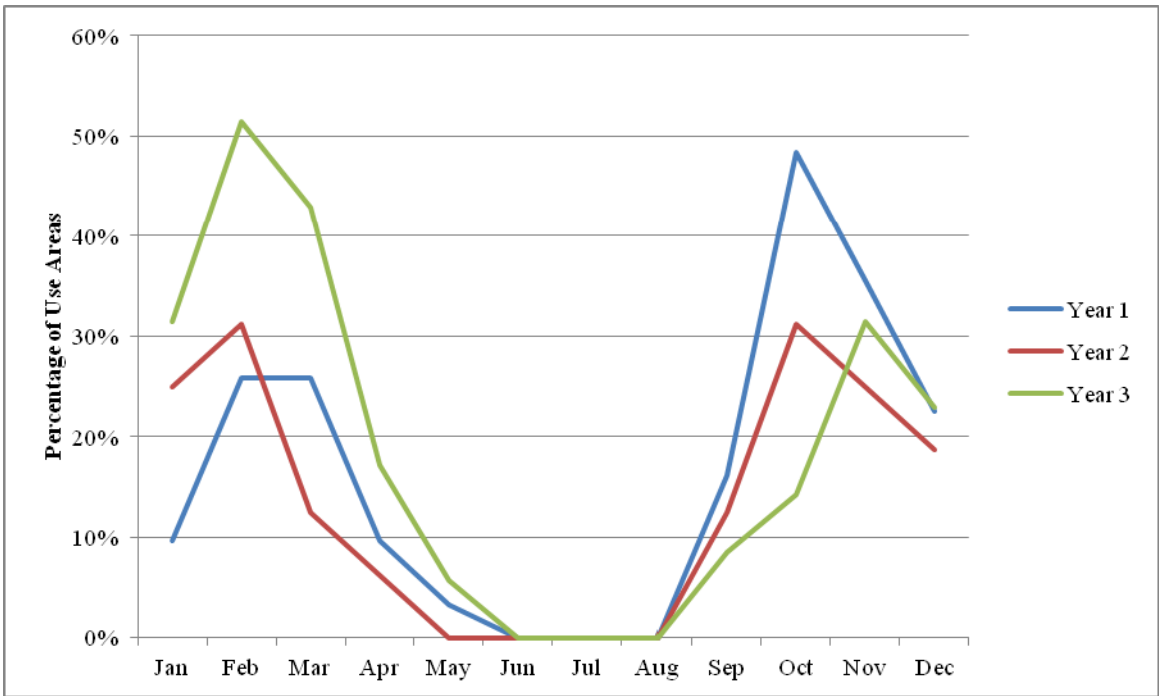


Figure 5: Four-wheeler Use by Month, Years 1-3

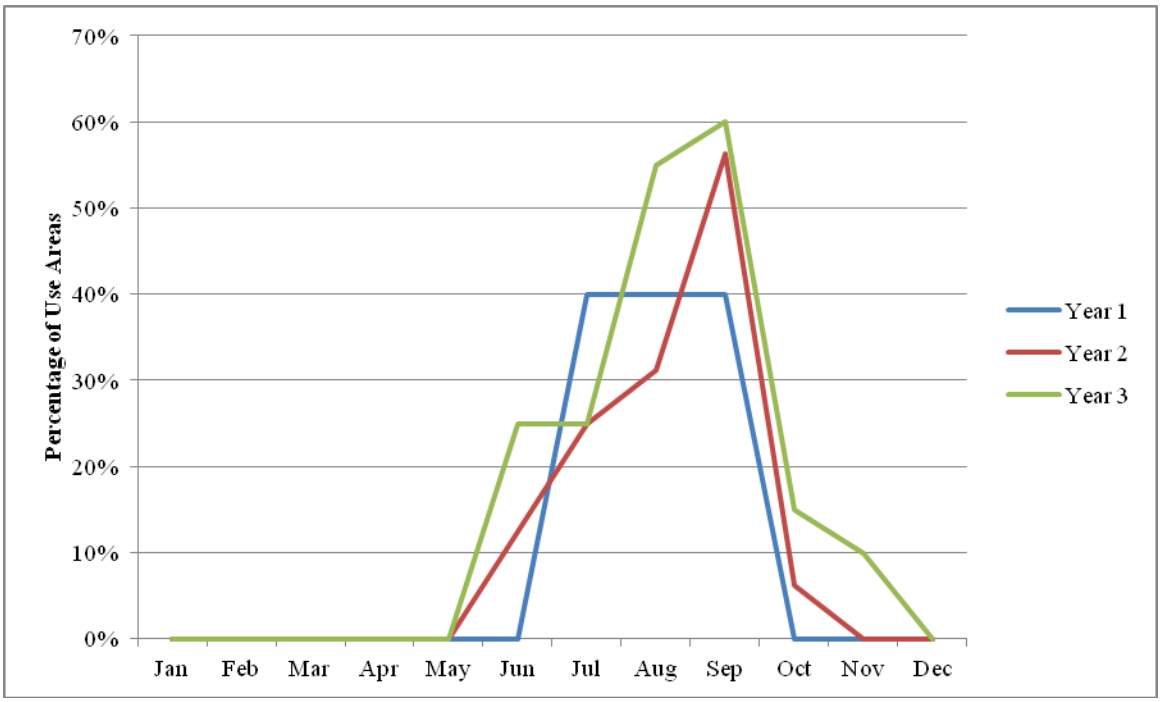


Table 8 depicts the percentage of caribou use areas in which respondents reported successful harvests. In Year 3, residents reported successfully harvesting one or more caribou at 58 percent of reported use areas. The percentage of successful use areas is notably lower than in Year 1, and similar to the previous study year (Year 2). During the draft review meeting with the caribou panel, one panel member commented on the change in successful use areas as follows: "It always has to do with the migration and where people go to wait for caribou to come through" (Nuiqsut Caribou Panel Meeting May 2012).

Table 8: Percentage of Caribou Use Areas in Which Respondents Reported Successful Harvests, Nuiqsut, Years 1-3

	Year 1	Year 2	Year 3
No	22%	39%	42%
Yes	78%	61%	58%
Total	100%	100%	100%
Number of Use Areas	138	186	215
Chi Square p = .000[2]			

Stephen R Braund & Associates, 2012.

During interviews, respondents were asked to identify the typical and longest duration of trip to each use area reported for the study year. As shown in Table 9, residents reported typically taking day trips to 90 percent of Year 3 caribou use areas. The duration of typical trips in Year 3 is similar to that reported in Year 1. Both Year 1 and Year 2 have fewer trips of 2-6 nights than Year 2 (Table 9). During Year 3, residents reported that their "longest trips" were same day trips to 80 percent of use areas (compared to 63 percent in Year 2) (Table 10). Harvester respondents took trips lasting up to two to six nights to 12 percent of Year 3 use areas. No respondents reported taking trips lasting more than two weeks during the Year 3 interviews.

Table 9: Caribou Hunting Typical Trip Duration, Nuiqsut, Years 1-3

	Year 1	Year 2	Year 3
More than 2 Weeks	0%	1%	0%
1-2 Weeks	1%	1%	1%
2-6 Nights	7%	15%	7%
1 Night	5%	2%	2%
Same Day	87%	81%	90%
Total	100%	100%	100%
Number of Use Areas	135	176	212
Chi Square p = .055			

Stephen R Braund & Associates, 2012.

[2] The p value can be interpreted as the probability that the observed differences could have occurred due to chance.

Table 10: Caribou Hunting Longest Trip Duration, Years 1-3

	Year 1	Year 2	Year 3
More than 2 weeks	1%	2%	0%
1-2 Weeks	3%	6%	4%
2-6 Nights	20%	24%	12%
1 Night	6%	5%	4%
Same Day	70%	63%	80%
Total	100%	100%	100%
Number of Use Areas	97	163	211
Chi Square p = .029			

Stephen R Braund & Associates, 2012.

Map 11 depicts use areas where respondents reported staying for one or more nights, and Map 12 depicts use areas where respondents reported taking same day trips. The red areas depict higher numbers of overlapping use areas on each map and do not reflect differences in trip length. As shown in Map 11, caribou harvesters most commonly reported taking overnight trips when traveling by boat upriver from the community. Fewer overnight trips were taken downriver from the community or at Fish Creek, and no overnight trips were reported during overland (i.e., snowmachine or four-wheeler) trips. Two individuals observed,

> *When we go up the river [Nigliq], they are all day trips. When we go south, we camp.* (SRB&A Nuiqsut Interview November 2010)

> *Winter time caribou hunting is basically day trips.* (SRB&A Nuiqsut Interview November 2010)

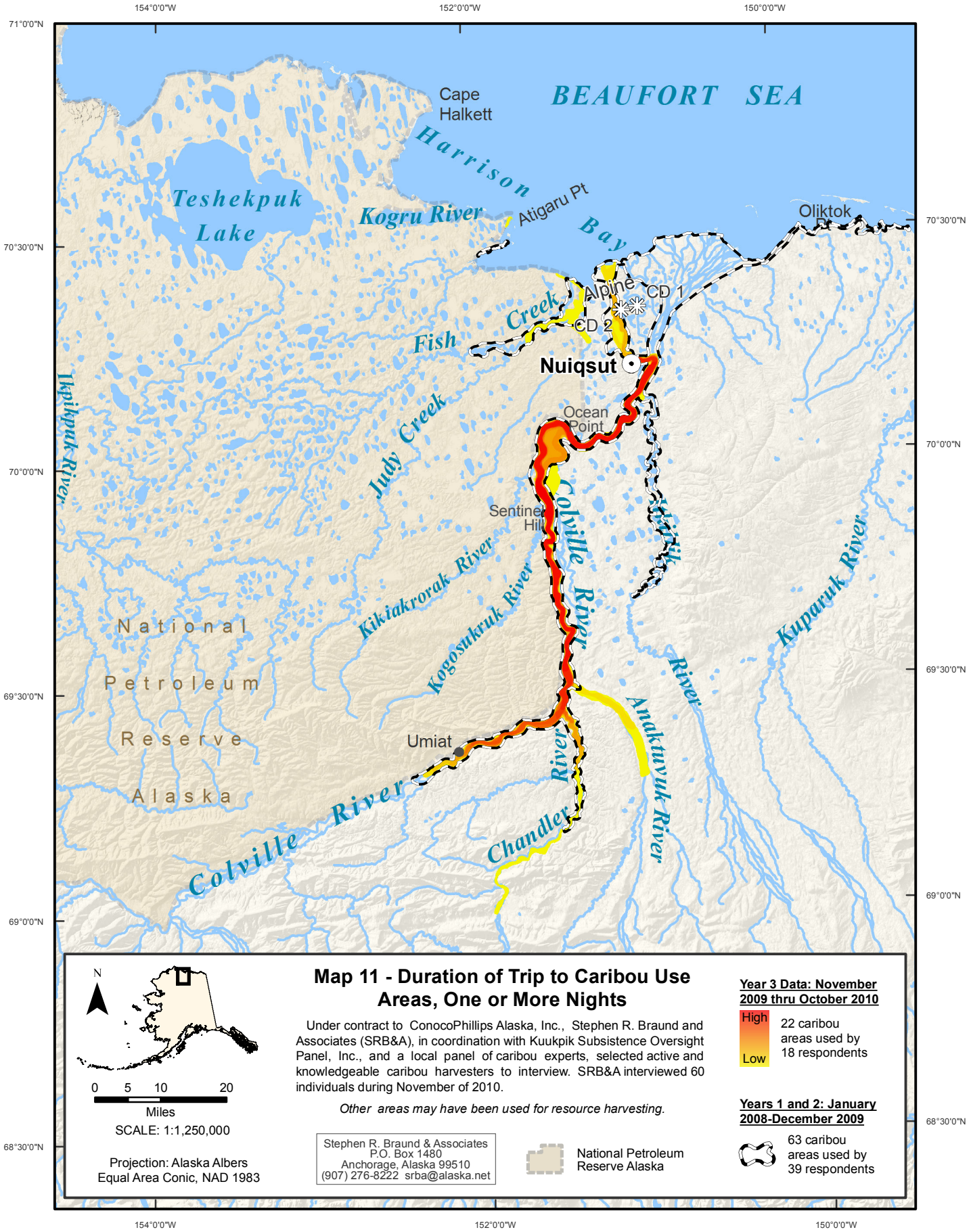
Nuiqsut harvester respondents were more likely to take more than 20 yearly trips to a caribou use area in Year 3, with nine percent of the use areas associated with 20 or more trips per year compared to zero percent during previous study years (Table 11). The frequency of trips to a use area depended on various factors, including the distance of the area from the community, hunting success, availability of transportation to the user, and personal reasons. One individual described the frequency of his Year 3 hunting trips by four-wheeler as follows:

> *Ever since I got my four-wheeler going and I am home and have nothing to do, I will go. Maybe two [times] a week, three [times] a week sometimes every day when I get stressed out and want to get out in the land. Probably 20 times, maybe more. I use less gas on the four-wheeler.* (SRB&A Nuiqsut Interview November 2010)

Table 11: Caribou Hunting Number of Trips, Nuiqsut, Years 1-3

	Year 1	Year 2	Year 3
20+	0%	0%	9%
6-20	30%	28%	21%
4-5	23%	21%	19%
2-3	27%	26%	27%
1	20%	24%	24%
Total	100%	100%	100%
Number of Trips	121	174	212
Chi Square p = .000			

Stephen R Braund & Associates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Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Fish Creek
Nuiqsut
Ocean Point
Judy Creek
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik River
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Anaktuvuk River
Chandler River
Colville River
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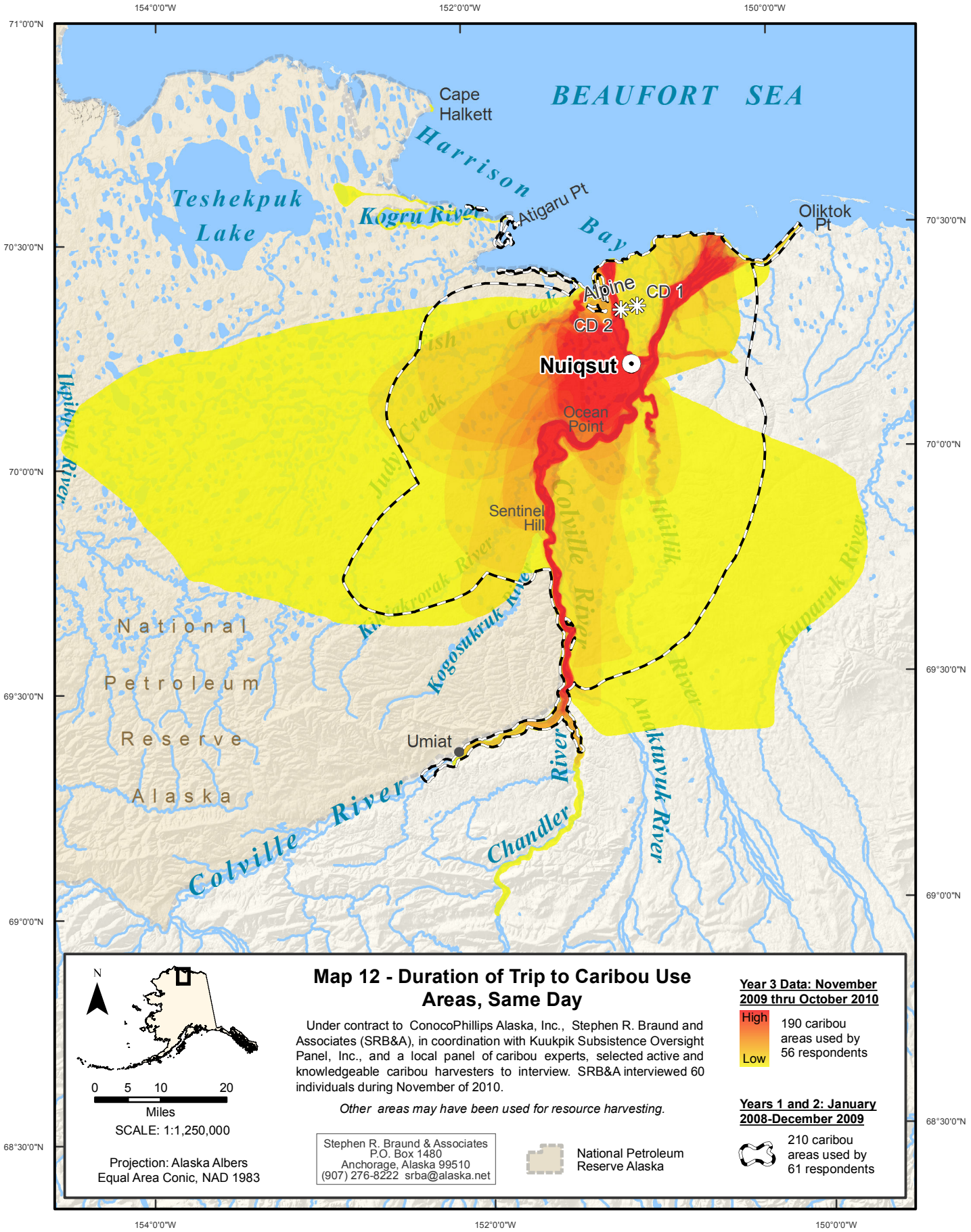
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 11 - Duration of Trip to Caribou Use Areas, One or More Nights
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009 thru October 2010
High
Low
22 caribou areas used by 18 respondents
Years 1 and 2: January 2008-December 2009
63 caribou areas used by 39 respondents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Teshekpuk Lake
Kogru River
Alpine
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CD 2
Nuiqsut
Ocean Point
Sentinel Hill
Judy Creek
Colville River
Itkillik
Kuparuk River
Kogosukruk River
Umiat
Chandler River
Anaktuvuk River
Ikpikpuk River
National Petroleum Reserve Alaska
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Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 12 - Duration of Trip to Caribou Use Areas, Same Day
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009 thru October 2010
High
Low
190 caribou areas used by 56 respondents
Years 1 and 2: January 2008-December 2009
210 caribou areas used by 61 respondents

HARVEST SITES

In addition to providing the location of their Year 3 caribou use areas, respondents identified the location of their harvest sites within each use area. They also reported the number of caribou harvested, the sex of each caribou harvested, and the harvest month.

Location of Harvest Sites

Map 13 shows the locations of Nuiqsut respondents' Year 3 caribou harvest sites with previous study year harvest locations shown in grey. Fifty-four respondents reported harvesting caribou at 196 harvest locations in Year 3. Respondents reported successful harvests occurring over a broad area along the Colville River and surrounding drainages. Harvests occurred as far as Kogru River in the west, Oliktok Point in the east, and near Umiat in the south. Harvests were also reported along the Chandler, Itkillik, Kachemach, and Miluveach rivers, and in several overland locations. The majority of harvest locations appear to occur along the Nigliq Channel, East Channel of the Colville River, upriver from the community to Sentinel Hill, and west of the community toward Fish Creek and Ocean Point.

Characteristics of Harvest Sites

The harvest numbers reported in this section of the report reflect only the number of caribou reported to be harvested by participating active harvester respondents during each study year. The reported numbers therefore do not include the harvests of individuals who did not participate in active harvester interviews during the study year and were not expanded to estimate for the community as a whole. In addition, the reported harvests may include duplicate harvests, as it came to the attention of the study team that respondents sometimes reported harvest of caribou which they did not personally shoot, but which were "collective" harvests shared among all participants in a given hunt. In Year 4, the study team initiated a method to account for these duplicate harvests and reconcile them by asking if the respondent shot the caribou, and if not, who did shoot the caribou. A more accurate reporting of the number of caribou harvested in Nuiqsut is provided through the results of the Year 3 household caribou harvest surveys, discussed in the following section.

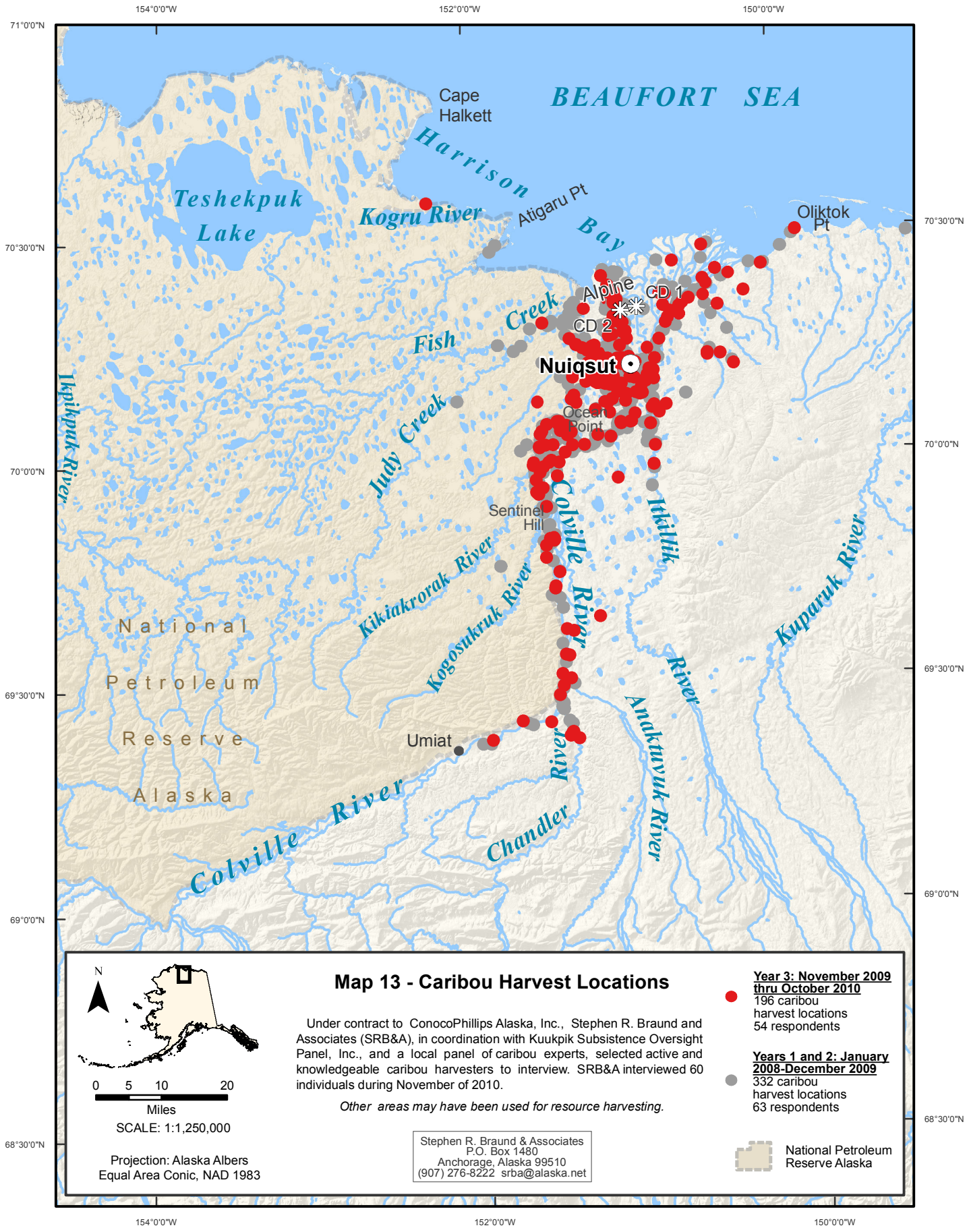
During Year 3 active harvester interviews, study participants reported 196 harvest locations. Nuiqsut respondents reported a similar number of caribou harvest locations in Year 1 (181) and Year 3 (196), despite a substantially higher number of successful harvester respondents in Year 3 (54 compared to 36 in Year 1) (Table 12).

Table 12: Number of Caribou Harvest Locations and Harvester Respondents by Study Year

	Year 1	Year 2	Year 3
Number of Caribou Harvester Respondents Reporting Harvest Locations	36	45	54
Number of Caribou Harvest Locations	182	152	196

Stephen R. Braund & Associates, 2012.

Caribou harvests occurred during every month of the Year 3 time period, with the lowest reported harvests in April, May, and December, and the highest reported harvests in July and August (Figure 6 and Table 13). The pattern of caribou harvests by month is similar across the three study years, with harvests peaking in July and/or August (Figure 6), but the percentage of caribou harvested by active harvester respondents in the peak month of August was lower in Year 2 than in Years 1 and 3 (Table 13). In Year 3, a higher percentage of reported caribou harvests occurred during the month of September (18 percent) compared to Year 1 (eight percent) and Year 2 (15 percent). Furthermore, a slightly slower percentage of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Teshekpuk Lake
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Ocean Point
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Kogosukruk River
National Petroleum Reserve Alaska
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Anaktuvuk River
Chandler River
Colville River
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SCALE: 1:1,250,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 13 - Caribou Harvest Locations
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 60 individuals during November of 2010.
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 3: November 2009 thru October 2010
196 caribou harvest locations
54 respondents
Years 1 and 2: January 2008-December 2009
332 caribou harvest locations
63 respondents
National Petroleum Reserve Alaska

Figure 6: Percentage of Caribou Harvested by Month, Years 1-3

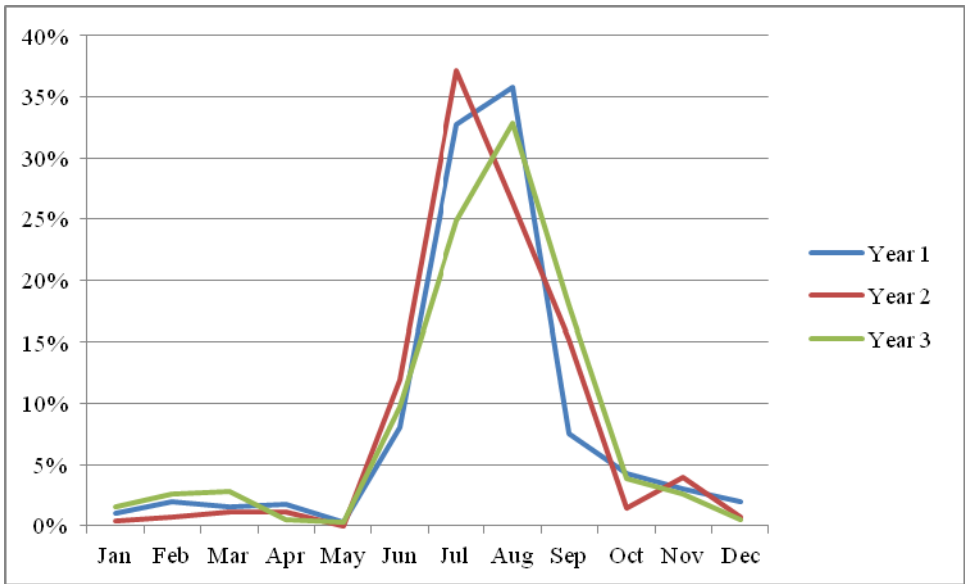


Table 13: Caribou Harvests by Month, Nuiqsut, Years 1-3

	Number of Harvest Areas			Number of Respondents			Number Caribou Harvested			Percent of Harvest		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Jan	3	1	3	3	1	3	4	1	6	1%	0%	2%
Feb	6	1	7	4	1	5	8	2	10	2%	1%	3%
Mar	4	2	4	4	1	4	6	3	11	2%	1%	3%
Apr	3	2	1	3	1	1	7	3	2	2%	1%	1%
May	1	0	1	1	0	1	1	0	1	0%	0%	0%
Jun	16	16	18	12	12	14	32	33	38	8%	12%	10%
Jul	62	59	55	30	29	33	130	103	97	33%	37%	25%
Aug	62	39	66	23	28	35	142	73	128	36%	26%	33%
Sep	10	25	30	6	17	19	30	42	70	8%	15%	18%
Oct	10	3	6	9	3	5	17	4	15	4%	1%	4%
Nov	7	4	5	3	2	5	12	11	10	3%	4%	3%
Dec	5	1	3	4	1	2	8	2	2	2%	1%	1%

Stephen R. Braund & Associates, 2012

harvests occurred in July of Year 3 compared to previous study years. Table 14 results show the number of reported caribou harvests by sex. Similar to the previous study year (sex was not recorded in Year 1), the majority of harvested caribou were males.

Table 14: Number of Caribou Harvested by Sex, Year 2 and Year 3

	Year 2	Year 3
Males	224	310
Females	38	45
Unknown	15	10
Total	277	365

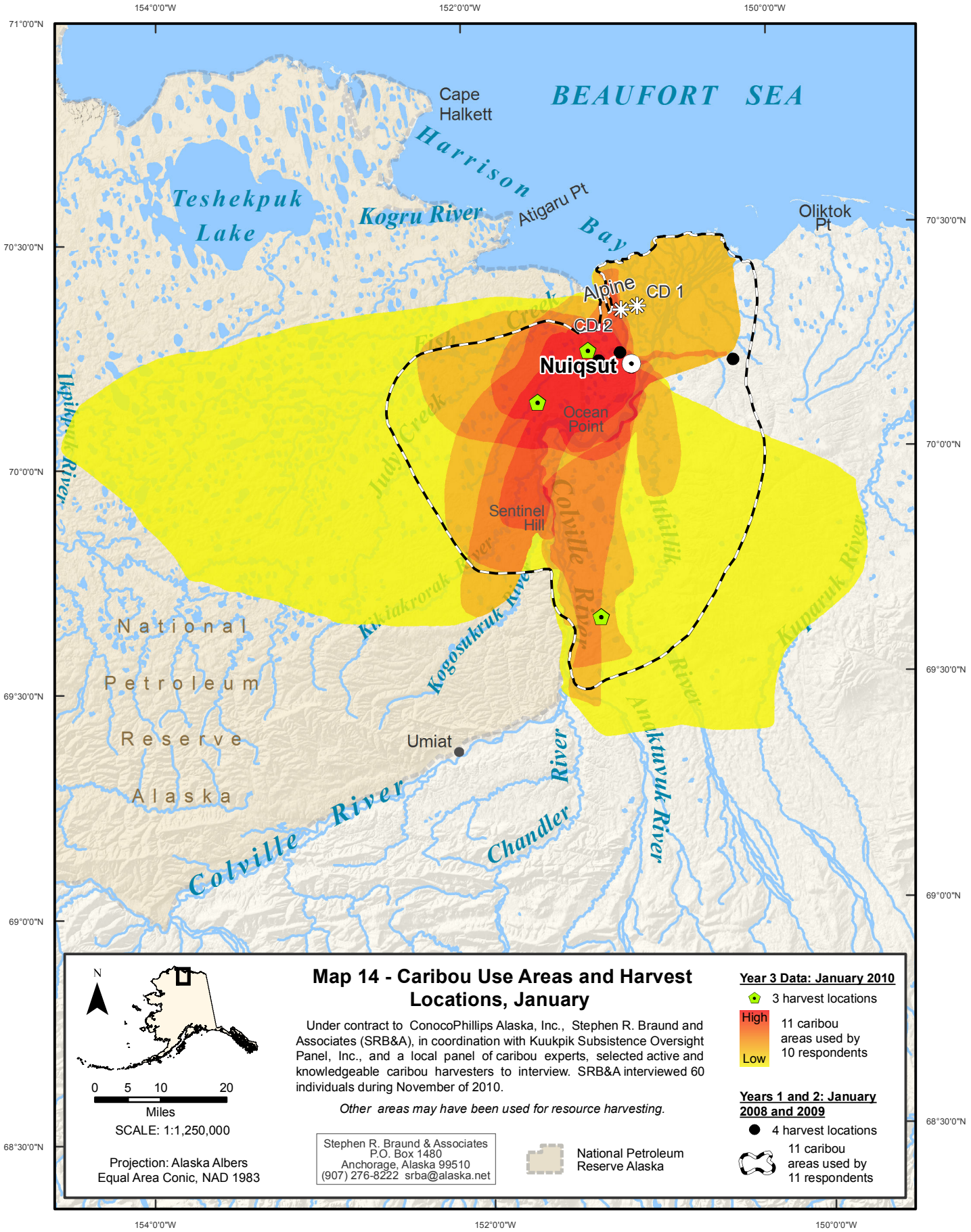
Stephen R. Braund & Associates, 2012.

Maps 14 through 25 show Year 3 caribou subsistence use areas by month, with the extent of previous study years (Year 1 and 2) shown as a single polygon. It is important to note that the Year 3 study year includes two months (November and December 2009) that were also included in the Year 2 study year[3] and therefore Maps 24 and 25 show the same months reported by two different samples of active harvesters. During Year 3, a higher number of respondents (12 in November and seven in December) reported use areas for those two months than in Year 2 (three respondents during each month).

According to Year 3 active harvester interviews, starting in November and December of 2009 (Maps 24 and 25), residents traveled overland by snowmachine primarily west of the community in an area toward Fish Creek and Ocean Point. Hunting activities also occurred along Nigliq Channel and east of the community along the ice road. A smaller number of respondents traveled farther in November of Year 3, extending south of the community along the Colville, Itkillik, and Kikiakrorak rivers, as well as west to Ikpikpuk River (one respondent). Previous study year data show residents traveling farther east in November with the western and southern extents of their travel similar to those reported in Year 3 (with the exception of the one Year 3 hunter who traveled as far as Ikpikpuk River). In December, residents traveled in a similar area but with heavier overlaps farther west and south of the community. From January to March (Maps 14 through 16), residents' hunting activities continued in a similar overland area west to Judy and Fish creeks and south beyond Sentinel Hill. April (Map 17) shows a decreasing level of activity, with only six respondents reporting use areas and only one harvest location reported. Despite the relatively large extent of Year 3 November through April use areas (compared to previous years), most reported Year 3 caribou harvests occurred within 20 miles of the community.

A small number of respondents reported continuing their snowmachine travels into the month of May (Map 18), with overland travel continuing west and south of the community. Previous study years show only limited overland travel occurring west of the community during May. May was also the month when boat travel started to a limited extent along the Colville River. Only one harvest location was identified for May 2010 near the confluence of Nigliq Channel and the East Channel on the Colville River. From June through September (Maps 19 through 22), residents' hunting activities increased substantially and were focused primarily along the Colville River (including Nigliq and East Channel), in addition to the Itkillik, Chandler, and Anaktuvuk rivers. Residents also traveled to the ocean starting in June and hunted for caribou along the coast, both east and west of the community. In June, harvest locations were scattered along the Nigliq Channel and Colville River to Sentinel Hill. July harvest locations increased and were focused along the Nigliq Channel and Colville River to Ocean Point. In August, the locations of harvests

[3] As discussed earlier, in Year 3 the study team shifted the study time period from a calendar year (January through December) to a November to October study year, in order to conduct active harvester interviews closer to the end of the peak caribou hunting season.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Harrison Bay
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Teshekpuk Lake
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Ocean Point
Sentinel Hill
Fish Creek
Judy Creek
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Colville River
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Kikiakrorak River
Umiat
Chandler River
Anaktuvuk River
National Petroleum Reserve Alaska
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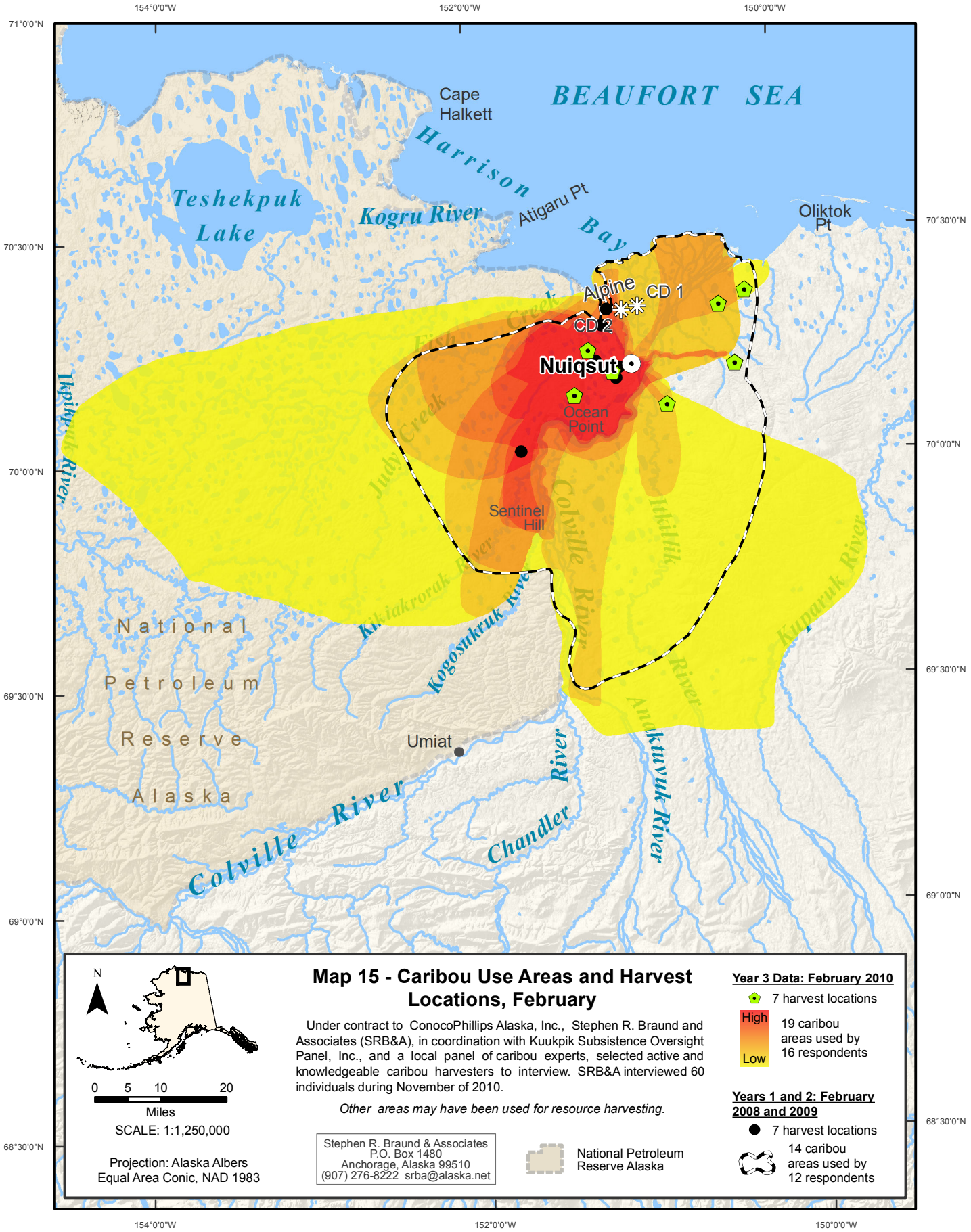
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 14 - Caribou Use Areas and Harvest Locations, January
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: January 2010
3 harvest locations
High
Low
11 caribou areas used by 10 respondents
Years 1 and 2: January 2008 and 2009
4 harvest locations
11 caribou areas used by 11 respondents



Map 15 - Caribou Use Areas and Harvest Locations, February

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 60 individuals during November of 2010.

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

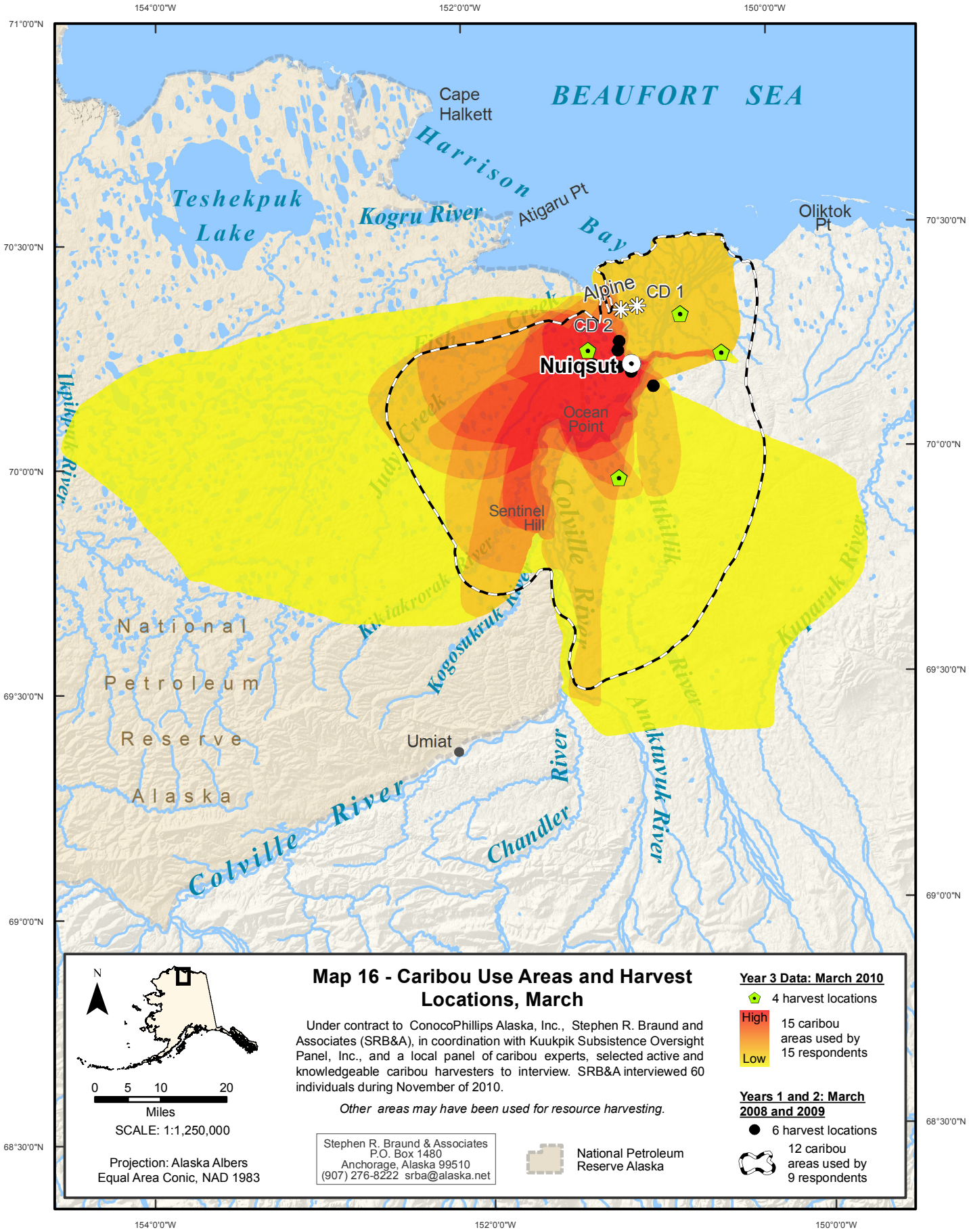
National Petroleum Reserve Alaska

Year 3 Data: February 2010

- 7 harvest locations
- High / Low: 19 caribou areas used by 16 respondents

Years 1 and 2: February 2008 and 2009

- 7 harvest locations
- 14 caribou areas used by 12 respondents



Map 16 - Caribou Use Areas and Harvest Locations, March

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 60 individuals during November of 2010.

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

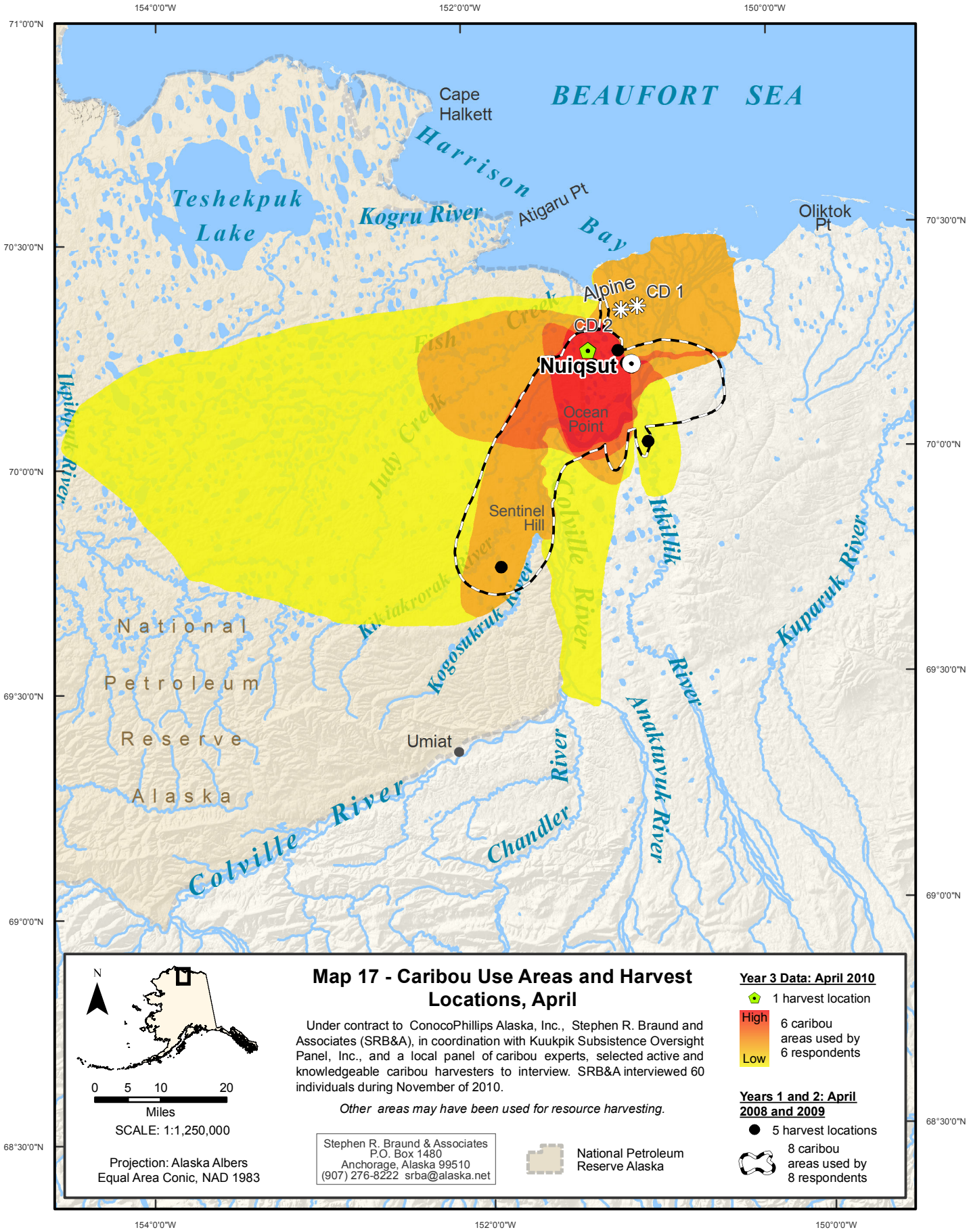
National Petroleum Reserve Alaska

Year 3 Data: March 2010

- 4 harvest locations
- High / Low: 15 caribou areas used by 15 respondents

Years 1 and 2: March 2008 and 2009

- 6 harvest locations
- 12 caribou areas used by 9 respondents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Itkillik River
Colville River
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Kikiakrorak River
Anaktuvuk River
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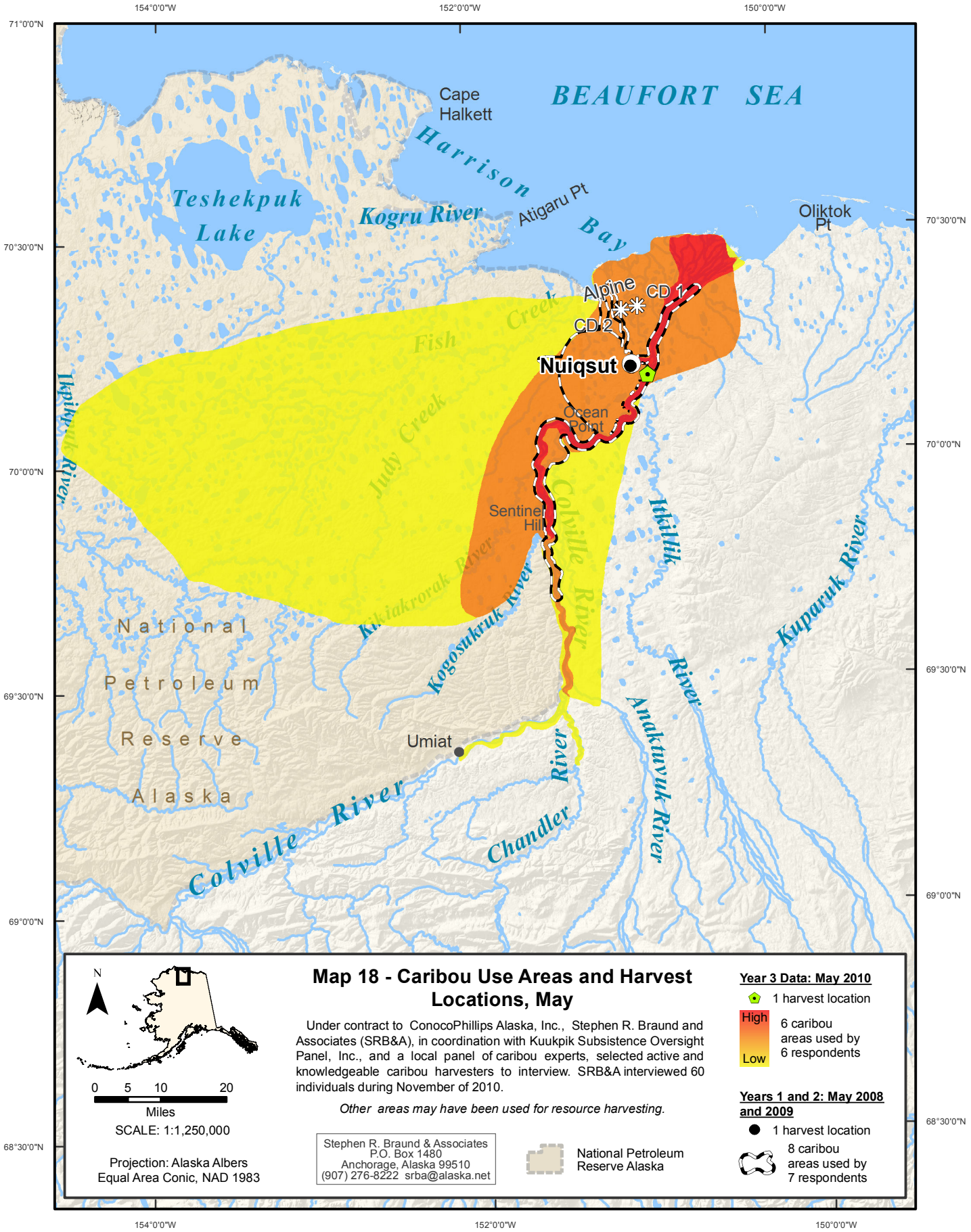
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 17 - Caribou Use Areas and Harvest Locations, April
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: April 2010
1 harvest location
High
Low
6 caribou areas used by 6 respondents
Years 1 and 2: April 2008 and 2009
5 harvest locations
8 caribou areas used by 8 respondents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Ikpikpuk River
Sentinel Hill
Colville River
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Kuparuk River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Chandler River
Anaktuvuk River
Colville River
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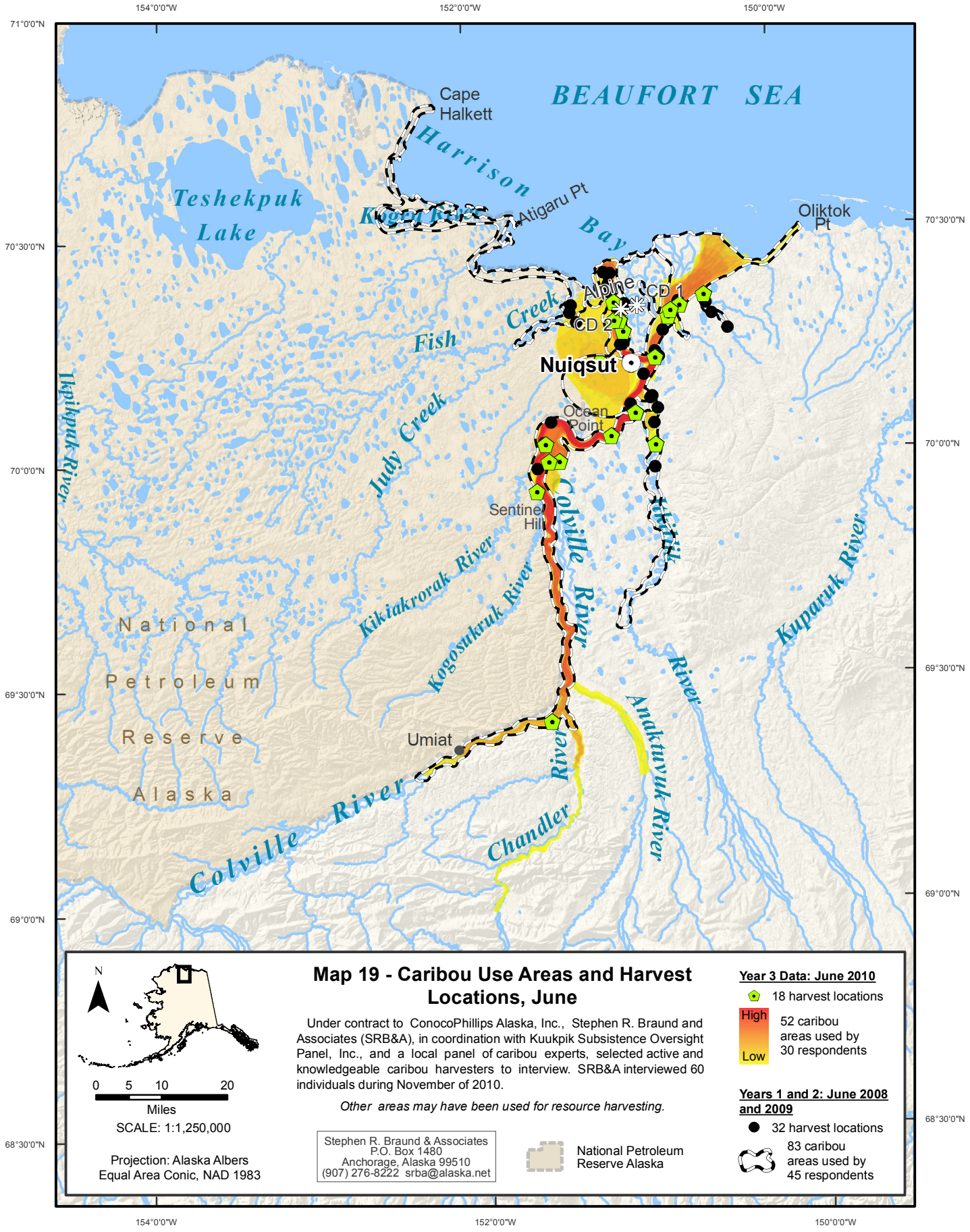
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 18 - Caribou Use Areas and Harvest Locations, May
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: May 2010
1 harvest location
High
Low
6 caribou areas used by 6 respondents
Years 1 and 2: May 2008 and 2009
1 harvest location
8 caribou areas used by 7 respondents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Itkillik River
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
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Anaktuvuk River
Chandler River
Colville River
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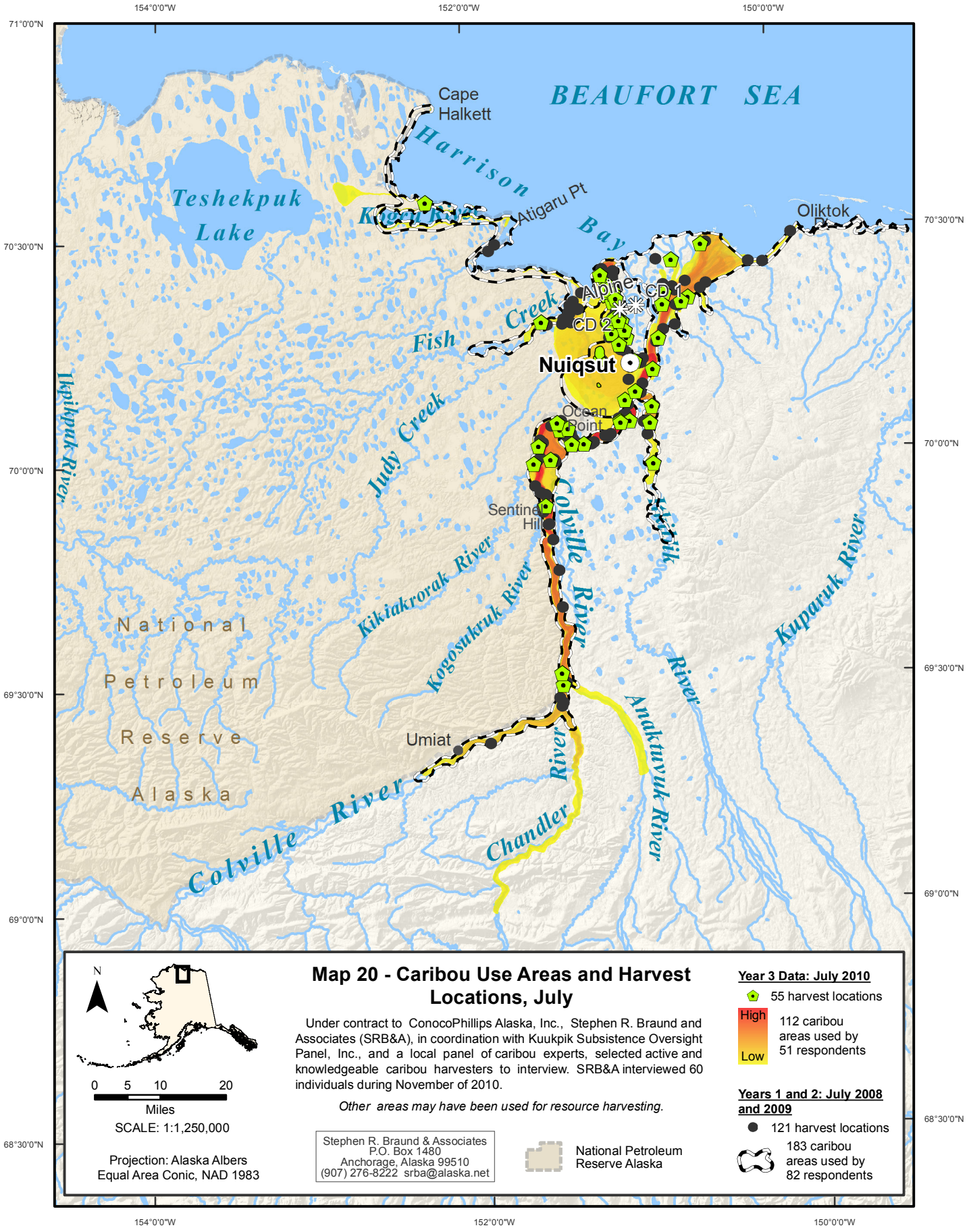
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 19 - Caribou Use Areas and Harvest Locations, June
Under contract to ConocoPhillips Alaska, Inc., Stephen R. Braund and Associates (SRB&A), in coordination with Kuukpik Subsistence Oversight Panel, Inc., and a local panel of caribou experts, selected active and knowledgeable caribou harvesters to interview. SRB&A interviewed 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: June 2010
18 harvest locations
High
Low
52 caribou areas used by 30 respondents
Years 1 and 2: June 2008 and 2009
32 harvest locations
83 caribou areas used by 45 respondents



Map 20 - Caribou Use Areas and Harvest Locations, July

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 60 individuals during November of 2010.

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

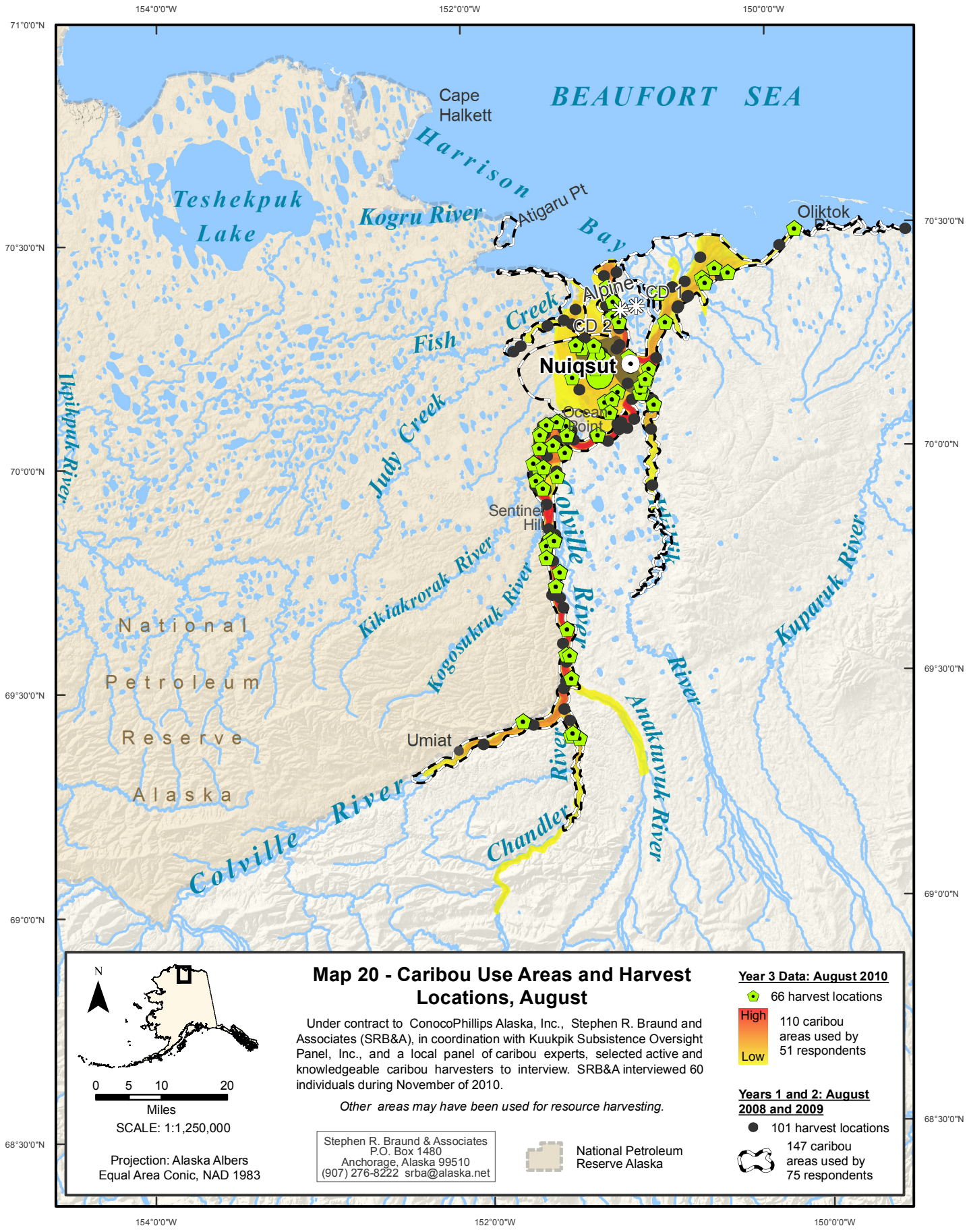
National Petroleum Reserve Alaska

Year 3 Data: July 2010

- 55 harvest locations
- High / Low: 112 caribou areas used by 51 respondents

Years 1 and 2: July 2008 and 2009

- 121 harvest locations
- 183 caribou areas used by 82 respondents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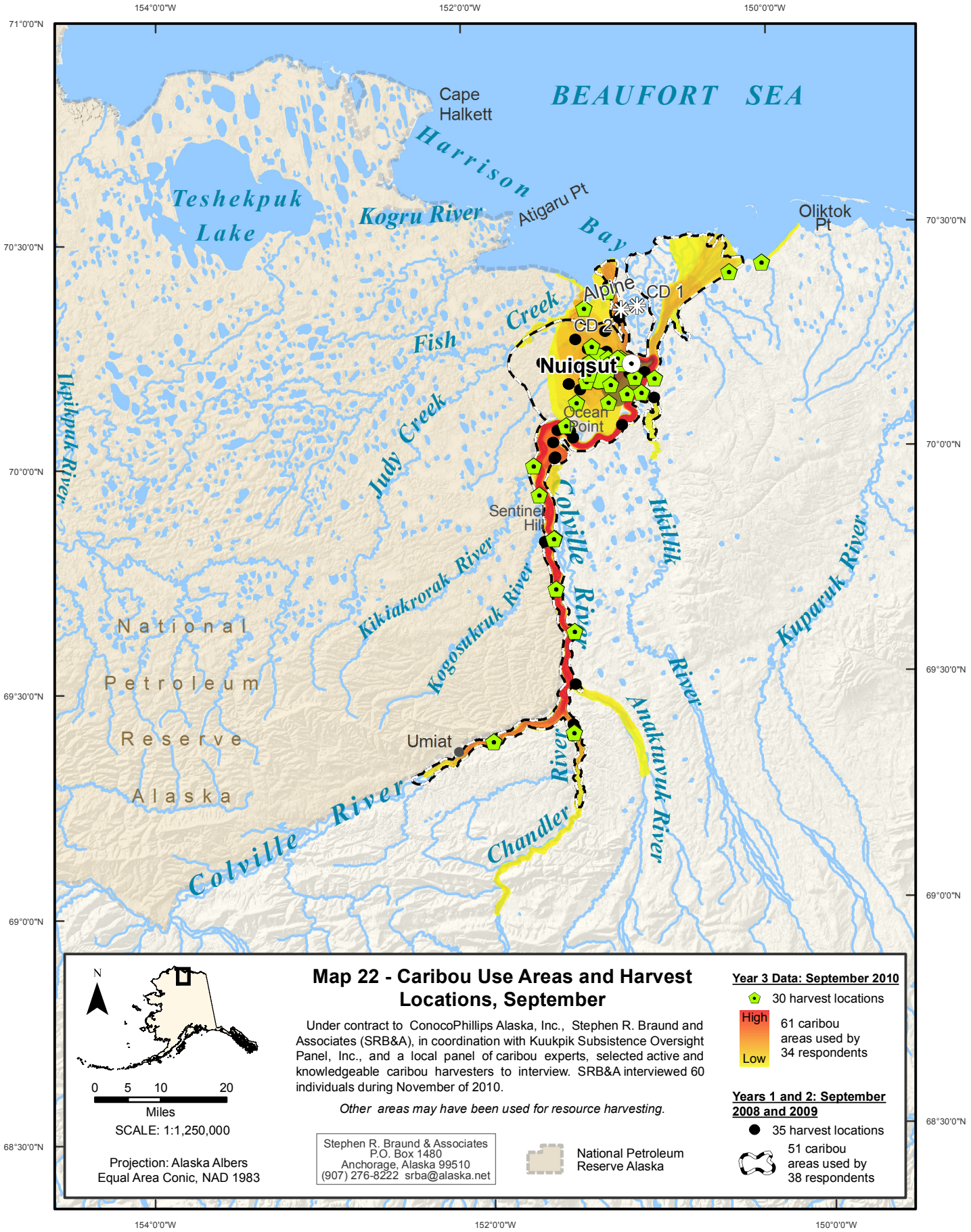
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Nuiqsut
Fish Creek
Judy Creek
Ocean Point
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik River
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Anaktuvuk River
Chandler River
Colville River
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 20 - Caribou Use Areas and Harvest Locations, August
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: August 2010
66 harvest locations
High
Low
110 caribou areas used by 51 respondents
Years 1 and 2: August 2008 and 2009
101 harvest locations
147 caribou areas used by 75 respondents



Map 22 - Caribou Use Areas and Harvest Locations, September

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 60 individuals during November of 2010.

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

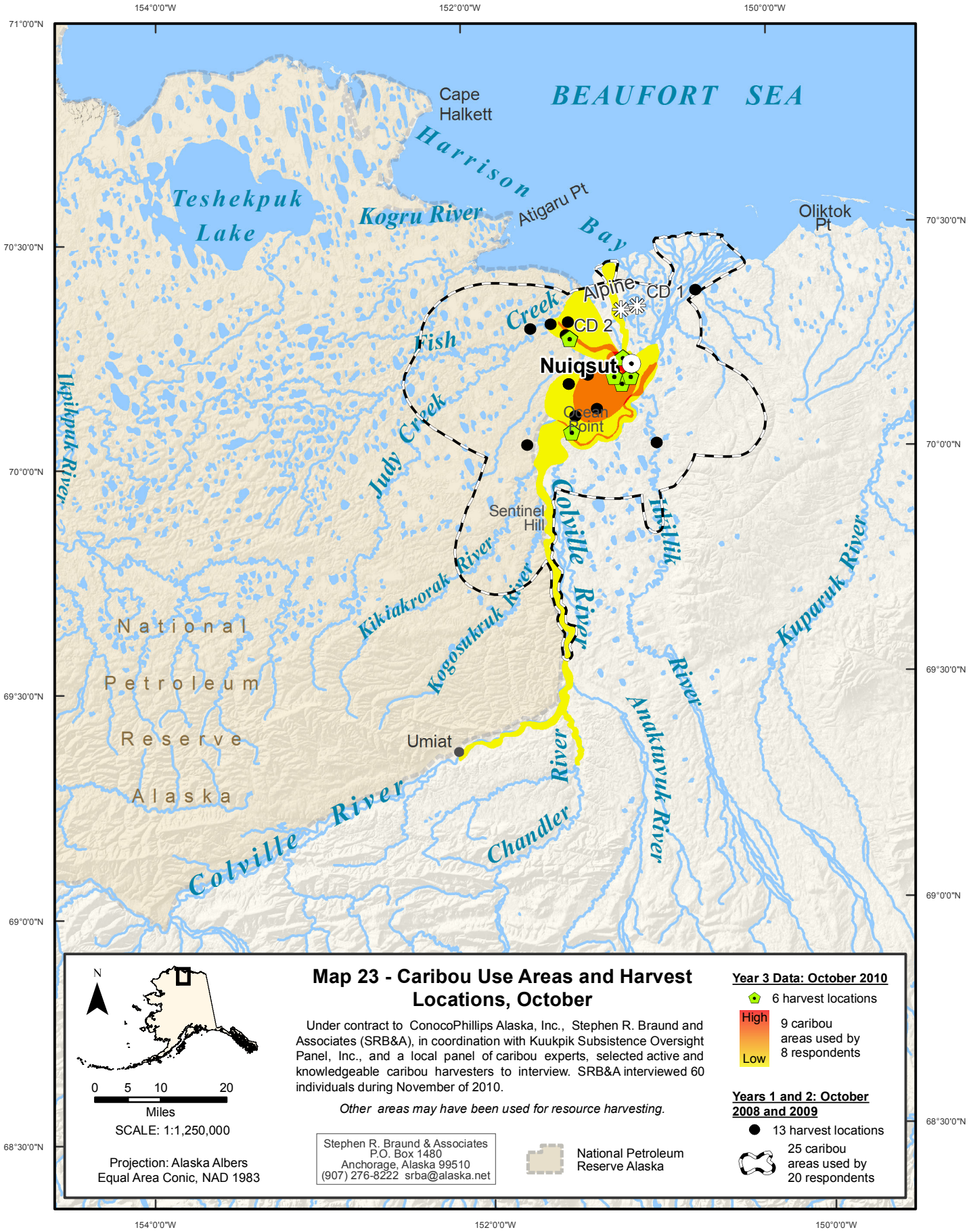
National Petroleum Reserve Alaska

Year 3 Data: September 2010

- 30 harvest locations
- High / Low: 61 caribou areas used by 34 respondents

Years 1 and 2: September 2008 and 2009

- 35 harvest locations
- 51 caribou areas used by 38 respondents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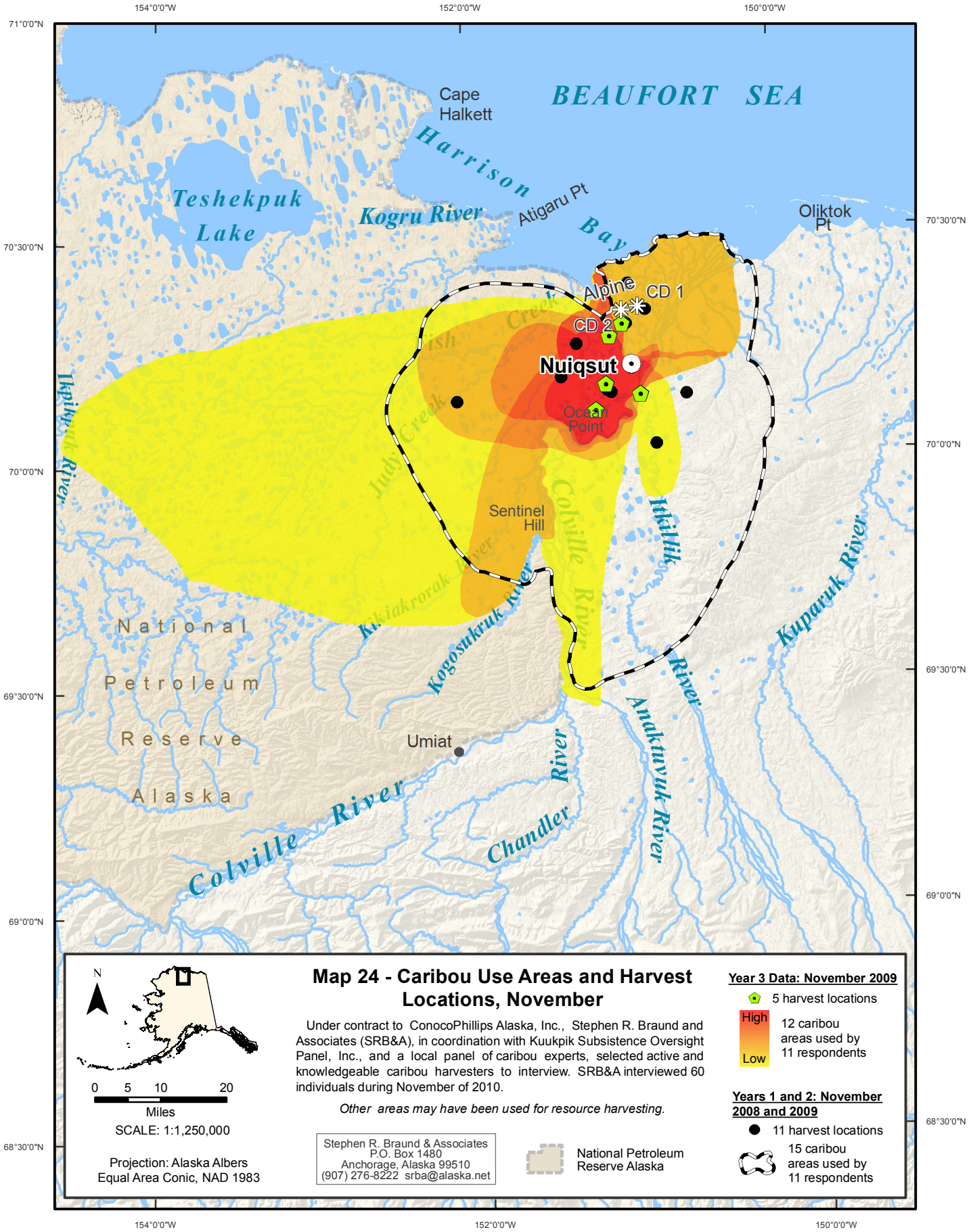
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Fish Creek
Nuiqsut
Ocean Point
Judy Creek
Ikpikpuk River
Sentinel Hill
Colville River
Itkillik
Kuparuk River
Kikiakrorak River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Anaktuvuk River
Chandler River
Colville River
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 23 - Caribou Use Areas and Harvest Locations, October
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: October 2010
6 harvest locations
High
Low
9 caribou areas used by 8 respondents
Years 1 and 2: October 2008 and 2009
13 harvest locations
25 caribou areas used by 20 respondents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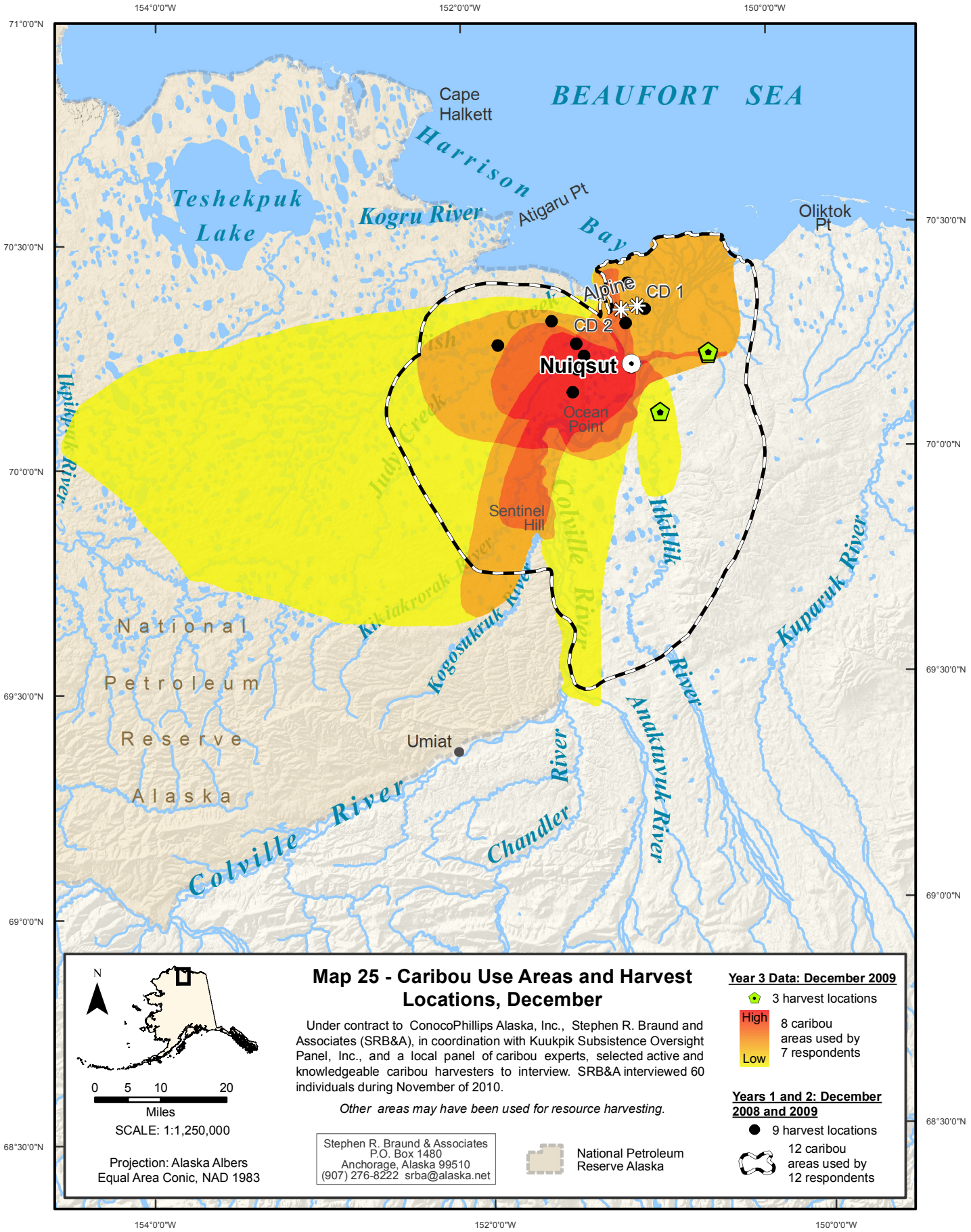
BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Nuiqsut
Ocean Point
Sentinel Hill
Judy Creek
Ikpikpuk River
Itkillik River
Kuparuk River
Colville River
Kogosukruk River
National Petroleum Reserve Alaska
Umiat
Chandler River
Anaktuvuk River
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 24 - Caribou Use Areas and Harvest Locations, November
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: November 2009
5 harvest locations
High
Low
12 caribou areas used by 11 respondents
Years 1 and 2: November 2008 and 2009
11 harvest locations
15 caribou areas used by 11 respondents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BEAUFORT SEA
Cape Halkett
Harrison Bay
Atigaru Pt
Oliktok Pt
Teshekpuk Lake
Kogru River
Alpine
CD 1
CD 2
Nuiqsut
Ocean Point
Sentinel Hill
Judy Creek
Ikpikpuk River
Itkillik River
Kuparuk River
Colville River
Kogosukruk River
Kikiakrorak River
National Petroleum Reserve Alaska
Umiat
Chandler River
Anaktuvuk River
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0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 25 - Caribou Use Areas and Harvest Locations, December
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 60 individuals during November of 2010.
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
National Petroleum Reserve Alaska
Year 3 Data: December 2009
3 harvest locations
High
Low
8 caribou areas used by 7 respondents
Years 1 and 2: December 2008 and 2009
9 harvest locations
12 caribou areas used by 12 respondents

extended farther upriver and overland west of the community, with a high frequency of harvests between Ocean Point and Sentinel Hill. Summer use areas and harvest locations occurred in similar areas during Years 1 and 2, although with more extensive travel along the coast, Itkillik River, and Fish Creek during previous study years.

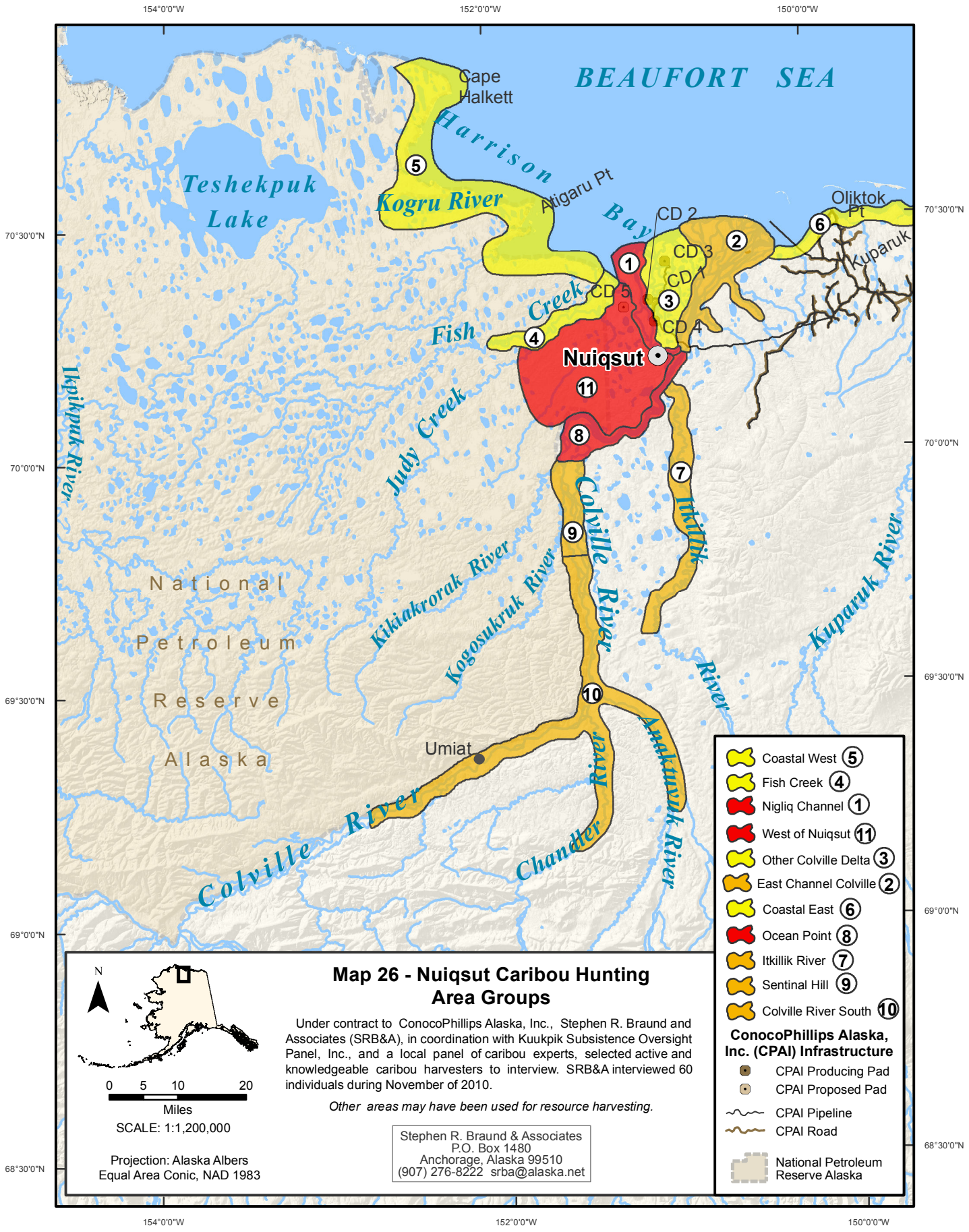
Residents continued boating in September (Map 22), with the majority of overlaps occurring upriver from the community to the mouth of the Chandler River. While harvests of caribou occurred as far as Chandler River and Umiat during the month of September, the majority of harvest locations were reported in an overland area with an increasing frequency of four-wheeler and snowmachine travel during that month. Residents' Year 3 activities in the month of October occurred west of the community, with the majority of harvests occurring close to the community. With the exception of one individual who reported traveling upriver into the month of October, residents did not engage in caribou hunting activities to the same geographic extent as in previous years (Map 23). One individual observed that the caribou left the area and were not as available to hunters during the month of October, saying, "[The caribou were] less. Last year they were here in October; they left early" (SRB&A Nuiqsut Interview November 2010).

Table 15 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 26). Map 26 depicts the geographic boundary of each hunting area group and categorizes each area as yellow, orange, or red, with the yellow areas representing the smallest percentage of the total caribou harvest and the red areas representing the largest percentage of the harvest. The red areas represent the areas accounting for 15 percent or more of the total harvest, the orange areas represent the areas accounting for between two and 15 percent of the harvest, and the yellow areas represent the remaining areas accounting for the less than two percent of the harvest.

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

Stephen R. Braund & Associates, 2012.



Map 26 - Nuiqsut Caribou Hunting Area Groups

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 60 individuals during November of 2010.

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

During Year 3, the area west of Nuiqsut (Area 11) accounted for the highest portion (30 percent) of the caribou harvested, followed by Nigliq Channel (Area 1) (18 percent), and Ocean Point (Area 8) (15 percent) (Table 15, Map 26). The East Channel of the Colville River (Area 2) and the southern portion of the Colville River (Area 10; beyond Sentinel Hill to Umiat and Chandler River) also contributed moderate amounts toward the total harvest. The area west of Nuiqsut (Area 11) accounted for a substantially greater percentage of reported caribou harvests in Year 3 compared to previous years (30 percent versus less than 20 percent in other study years) (Table 15). Years 2 and 3 show a higher percentage of harvests coming from the "Colville River South" area, and Years 1 and 3 show a higher percentage of harvests coming from "Other" areas (i.e., outside the extent of the other 11 hunting area groups).

Harvests at Fish Creek declined from seven percent of the total harvest in Years 1 and 2 to one percent in Year 3. Nuiqsut caribou panel members commented on this trend during the Year 3 draft review meeting. Two individuals commented that air traffic related to studies west of Nuiqsut may have resulted in caribou being less available in the Fish Creek area. One individual said,

> *It [air traffic] is keeping the caribou away from Fish Creek area, where it is connected to Judy Creek…. You can see six or seven [pads] right there, waiting for development. That will affect our hunting if those [pads] are developed…. They [caribou] hardly come to the Fish Creek area when there is so much traffic. That is why you see hardly any dots [for Year 3] that way. They have been diverted elsewhere.* (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

Panel members also noted that caribou used to be more present along the coastal areas during the insect relief season:

> *I usually go towards Kogru [River]; there was an abundance of the Teshekpuk herd. That was an insect relief area. Atigaru [Point] is eroding out there now, too; it's gone. There was an abundance of insect relief areas; you don't see those in summer anymore. That's where the majority of the bulls were at, but you don't see them nowadays. Just west of Oliktok [Point] there used to be an abundance of caribou, but not anymore over there, either* (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

> *… I have heard a lot of oil companies say that they are stuck on the other side of Milne Point.* (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

As shown on Map 26, three areas closest to the community of Nuiqsut (Nigliq Channel, West of Nuiqsut, and Ocean Point) accounted for a majority (the first 50 percent) of reported caribou harvests during Year 3. Those areas, in addition to the East Channel of the Colville River and the Colville River south of Sentinel Hill towards Umiat accounted for the first 75 percent of caribou harvested.

Table 16 shows the number of harvest locations by the number of caribou harvested. In general, residents reported harvesting fewer than 10 caribou at any given caribou harvest location. During Years 1 and 3, 15 caribou were reportedly harvest at one harvest location. In most cases, residents reported harvesting 1 to 2 caribou at a single harvest location. In Year 3, 181 of the 196 harvest locations (92 percent) represented harvests of fewer than four caribou.

Table 16: Number of Caribou Harvested by Number of Harvest Locations, Years 1-3

Number of Caribou Harvested	Year 1	Year 2	Year 3
1	95	75	99
2	44	48	60
3	19	16	22
4	7	8	7
5	13	4	5
6	1	1	2
7	2	0	0
15	1	0	1

Stephen R. Braund & Associates, 2012

HARVEST AMOUNTS (HOUSEHOLD HARVEST SURVEYS)

This section presents the results of the Year 3 household caribou harvest surveys alongside harvest data available from ADF&G and NSB harvest studies from previous years. Table 17 compares harvest information over time.

Table 17: Nuiqsut Caribou Harvests 1985-2011

Year	Percent Using	Percent Attempting to Harvest	Percent Harvesting	Estimated Harvest	Estimated Pounds Harvested	Average Lbs Harvested per Household	Source
1985	98%	90%	90%	513	60,021	790	ADF&G 2011
1992		81%		278	32,551		Fuller and George 1999
1993	98%	74%	74%	672	82,169	903	Fall and Utermohle Unpublished
1994-1995				258	30,186	364	Brower and Hepa 1998
1995-1996				362	42,354	455	Bacon et al. 2009
2000-2001				496	57,985	453	Bacon et al. 2009
2002-2003	95%	47%	45%	397	46,449	442	Braem et al. 2011
2003-2004	97%	74%	70%	564	65,988	617	Braem et al. 2011
2004-2005	99%	62%	61%	546	63,882	597	Braem et al. 2011
2005-2006	100%	60%	59%	363	42,471	442	Braem et al. 2011
2006-2007	97%	77%	74%	475	55,575	579	Braem et al. 2011
2010	94%	86%	76%	562	65,754	707	SRB&A 2011

Stephen R. Braund & Associates, 2012

The percent of Nuiqsut household using caribou has remained high and shows no apparent upward or downward trend. In 2010, 94 percent of households reported using caribou, 86 percent reported attempting harvests of caribou (higher than most previous years), and 76 percent reported successful harvests of caribou. The percent of households attempting to harvest caribou has varied markedly over time ranging from 90 percent in 1985 to a low of 47 percent in 2002-03. Again there is no apparent trend over time. The percent of households successfully harvesting caribou shows a similar pattern of variation

to the percent attempting to harvest caribou, which is possibly related to annual variations in the presence of caribou or their availability to Nuiqsut hunters. The average pounds of caribou harvested per household was higher in the 1985 and 1993 observation years than in more recent years, which have been variable with a possible increase first observed in 2003-04 (617 mean household pounds) and continuing through 2010 (707 mean household pounds), but still subject to annual variations (Figure 7).

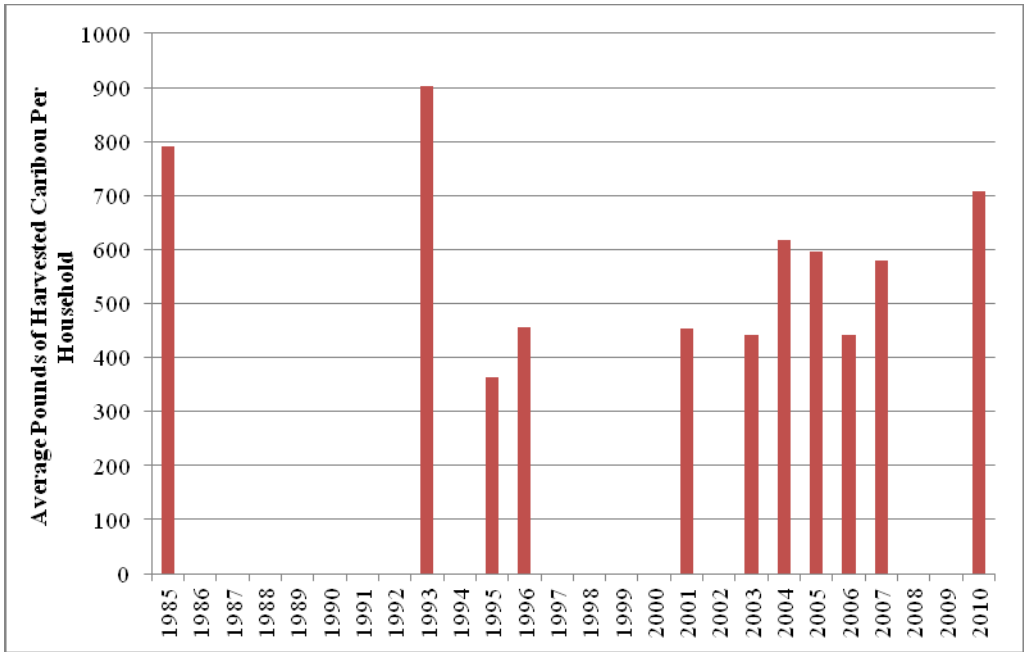
During the Year 3 draft review meeting with the Nuiqsut caribou panel, several panel members commented on the comparison of harvest data over time. One panel member noted that average household pounds may have been higher during the 1980s because there were fewer households in Nuiqsut and more people per household. He observed,

> *I was wondering if you took into consideration that in 1985 one section of the town wasn't even around over here. Your households are going to be a lot less back in 1985; with the [higher] number of households, you would expect it [average household pounds] to be going down.* (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

Another respondent noted that some high harvest years may reflect low harvests of other species such as bowhead whales. The community of Nuiqsut did not harvest a bowhead whale in 1985; however, three bowhead whales were harvested in 1993 (Suydam and George, n.d.). One panel member believed that the years of lower harvests may have been related to increased harvests at those times, saying,

> *Back in 1995 and 1996 that was when they were doing a lot of seismic over here. Looking at this chart over here, you take a look at the harvest of how many pounds per household over here, in 2000-2001 that is when Alpine started, we [our harvests] are just starting to go back up now with these studies. Clearly you can see that this place has been impacted by looking at these charts over here.* (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

Figure 7: Average Pounds of Harvested Caribou Per Household, Nuiqsut, 1985-2011



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. Respondents were also asked if they harvested enough caribou to meet their needs. 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 18 summarizes the percent of respondents reporting a given type of change. Table 19 shows the percentage of respondents reporting that they did not harvest enough caribou during Year 1, 2, and 3. Year 3 results show an increase over Years 1 and 2 in the percentage of harvester respondents who reported a change in hunting area. Year 3 results also showed a marked decrease in the percentage respondents who reported that they did not harvest enough caribou to meet their needs, as well as a decrease in the percentage of respondents who reported changes in harvest amounts and trip duration.

Table 18: Percentage of Respondents Reporting Changes in Harvest Activities Compared to Previous Year, Years 1, 2, and 3[4]

	Percentage of Respondents		
	Year 1	Year 2	Year 3
Hunting Area Changed	31%	28%	39%
Frequency Changed	50%	77%	65%
Duration Changed	39%	32%	21%
Months Changed	19%	15%	12%
Harvest Amount Changed	75%	85%	68%

Stephen R. Braund & Associates, 2012.

Table 19: Percentage of Respondents Reporting Not Harvesting Enough Caribou, Years 1, 2, and 3

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

Stephen R. Braund & Associates, 2012.

Changes in Harvest Amount

During Year 3 interviews, 68 percent of Nuiqsut respondents reported a change in harvest amounts, somewhat lower than previous years, with 75 percent reporting a change in harvest amount in Year 1 and 85 percent in Year 2 (Table 18). Year 3 results show a decrease in the percentage of harvester respondents reporting that less caribou were harvested and a small increase in the percentage of respondents reporting that more caribou were harvested in comparison with the previous year (Table 20). While 47 percent of Year 3 respondents reported a decrease in caribou harvests, the remaining 53 percent either reported no change in harvest amounts or reported an increase in harvests. One individual described, “It was about the same [as last year]. I would get half and my brother would get half” (SRB&A Nuiqsut Interview November 2010).

[4] 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, the percentage of respondents is based on the total number of respondents who participated in the active harvester interview (not including elders). Thus, the percentages depicted for Years 1 and 2 are slightly different than those depicted in previous study year reports.

Table 20: Type of Change in Harvest Amount, Years 1-3

	Percentage of Respondents		
	Year 1	Year 2	Year 3
Harvest More	11%	15%	21%
Harvest Less	64%	70%	47%

Stephen R. Braund & Associates, 2012

Table 21 shows a cumulative list of reasons given for a decrease in harvest from the previous year. The most common reasons given for a decrease in harvest in Year 3 were "take fewer trips," [caribou were] "farther from riversides or farther inland," "personal reasons," "lack of transportation/equipment," and "moved out of area," The most common reason given during previous study years was a more general observation of "resource availability" (Table 21).

Table 21: Reasons for Decrease in Harvest Amount, Nuiqsut, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Take fewer trips	0	1	6
Farther from riversides/farther inland	0	2	4
Personal Reasons	0	3	3
Lack of transportation/equipment	2	1	3
Moved out of area	0	0	3
Change in subsistence providers	1	1	2
Employment/Lack of time	1	2	2
Development	2	1	2
Resource Availability	8	9	2
Reduced harvest opportunities	0	0	1
Worse success	0	0	1
Wind	0	0	1
Skittish Behavior in Species	0	0	1
Predators	0	0	1
Earlier Migration/Arrival	0	0	1
I Do not Know	0	2	1
Need less	2	0	0
Change in subsistence dependents	3	2	0
More difficult	2	0	0
Travel farther to harvest resource	1	0	0
Helicopter Traffic Disturbance	4	0	0
Airplane Traffic Disturbance	2	1	0
Air Traffic	1	0	0
Oil Drilling	0	1	0
Pipeline	1	1	0
Contamination from air pollution	0	1	0
Sport Hunting Methods Disturbing Migration Routes	0	1	0

	Number of Observations		
	Year 1	Year 2	Year 3
Resource in Smaller Groups	1	0	0
Increase in Predators	0	1	0
Migration changed or diverted	3	5	0
Further from Community	0	1	0
Change in Food Availability	0	2	0
Change in distribution/migration	0	1	0

Stephen R. Braund & Associates, 2012.

In contrast to Year 1, there were no mentions of helicopter or airplane traffic disturbance as the direct cause of decreased harvests. Six individuals reported harvesting fewer caribou because of a decrease in hunting effort during the Year 3 study period. In addition, three individuals cited a lack of transportation or equipment (i.e., their boat, snowmachine, or four-wheeler broke down), two cited employment or a lack of time, and two cited a change in subsistence providers (e.g., another family member hunted more and provided for the household). Several individuals described,

> *I got two caribou; it was less than the year before. I got six or seven last year. I didn't get to go out much this year because my son was going out every chance he got, and he was coming back with everything. He kept coming back with more. His mom kept saying go get some more. He went up quite frequently. I think he got six or eight of them this last year, because he filled up the freezer.* (SRB&A Nuiqsut Interview November 2010)

> *Yeah, it was a big old zero [this year]. I just didn't spend enough time out there, [I] need to get out there more.* (SRB&A Nuiqsut Interview November 2010)

> *[I got] less [caribou] than last year. Usually I get about 10 every year but this year my little brothers were getting them, and I didn't have to. I was looking for moose [instead].* (SRB&A Nuiqsut Interview November 2010)

Several individuals cited a decreased availability of caribou as the cause of their decreased harvests. Observations of decreased resource availability included the caribou being farther inland or farther from the riversides (where hunters wait for them during the summer boating season), the caribou moving out of the area, and resource availability in general. Harvester comments included:

> *Less than last year. Some of them were a little bit too much inland and some of them [I] didn't catch them in time; they were already going away.* (SRB&A Nuiqsut Interview November 2010)

> *No, it's actually less [caribou] than I usually get. Everybody's saying that they have been seeing the wolves and wolverines. I think that they're [caribou] already getting used to the pipeline.* (SRB&A Nuiqsut Interview November 2010)

> *Probably [harvested] a little less. Just, not seeing too many caribou around. The day trips were just long waits and scouting. I don't know, we've had some wind; many days they don't move around as much.* (SRB&A Nuiqsut Interview November 2010)

One respondent attributed his decline in caribou harvest to a continued effect from Alpine facilities, saying,

> *[I harvested] less. There's less caribou out there than there used to be before the facilities were built. They have offset the caribou a little bit. Me and [hunting partner]*

were just talking about that this morning. Before those facilities were there, we would watch the big caribous, the bulls, running along the coast. (SRB&A Nuiqsut Interview November 2010)

Table 22 shows a cumulative list of reasons given for an increase in harvest from the previous year. No single reason was cited more commonly than the others. Reasons included "take more trips," "resource availability," and "moved into area."

Table 22: Reasons Given for Increase in Harvest Amount, Nuiqsut, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Take more trips	1	3	2
Resource Availability	0	2	2
Moved into area	0	0	2
Better transportation/equipment	0	0	1
Personal Reasons	2	2	1
Change in subsistence dependents	1	0	1
Change in subsistence providers	0	0	1
Better success	0	0	1
Migration changed or diverted	0	0	1
Need more	0	1	0
Closer to Community	1	0	0

Stephen R. Braund & Associates, 2012

Changes in Trip Frequency

As shown in Table 18, the percentages of harvester respondents reporting a change in trip frequencies has varied over the three study years from 50 percent (Year 1) to 77 percent (Year 2). In Year 3, 65 percent of respondents reported a change in the frequency of their caribou hunting trips. Of the respondents who reported a change in frequency of trips during each of the study years, a nearly equal percentage of these respondents reported taking more trips or fewer trips (e.g., 32 percent [more trips] and 33 percent [fewer trips] in Year 3) (Table 23).

Table 23: Type of Change in Trip Frequency, Nuiqsut, Years 1-3

	Percentage of Respondents		
	Year 1	Year 2	Year 3
Take more trips	25%	36%	32%
Take fewer trips	25%	42%	33%

Stephen R. Braund & Associates, 2012

The two most common reasons given for taking more trips to a given harvest location in Year 3 are "better transportation/equipment" and "personal reasons" (Table 24). Increased opportunities to hunt, either in the form of more time, more access to equipment, more caribou near the community, or more invitations to hunt with other residents, sometimes led to residents taking more trips than the previous year. Increased access to equipment was given as a reason by multiple respondents for taking more trips in Year 3:

[More] because my son had a snowmachine in case I broke down, which was a good idea. I was trying to show my son about the land. (SRB&A Nuiqsut Interview November 2010)

I went more; my cousin got a new boat and they started inviting me more when I got used to my gun. My girlfriend's family wanted to take me every time once they found out I was one shot. (SRB&A Nuiqsut Interview November 2010)

A lot more than last year. I didn't have a snowmachine last year. [This year] *I went out every chance I had.* (SRB&A Nuiqsut Interview November 2010)

It was more, for the fact that I had my own machine. [It was] the first year I bought my own machine too. I just broke it too, like 40 miles out. (SRB&A Nuiqsut Interview November 2010)

Table 24: Reasons for Increase in Trip Frequency, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Better transportation/equipment	0	0	7
Personal Reasons	0	6	7
Need more	0	0	2
Resource Availability	4	7	2
Moved into area	0	0	1
Moved out of area	0	0	1
Sharing More	1	0	0
Mitigation Funds	1	0	0
Competition with sport hunters	0	1	0
Traffic Disturbance	1	1	0
Development	2	1	0
Pipeline	1	0	0
Migration changed or diverted	2	0	0
I Do not Know	0	1	0

Stephen R. Braund & Associates, 2012

In several cases, residents reported taking more trips in order to harvest more caribou either because they had more people to provide for or because they had low hunting success.

[I went out] more, I kept going out with how many different guys. [There were] a little bit less caribous, I don't see any herds. The most I saw [at one time] was seven. (SRB&A Nuiqsut Interview November 2010)

Probably more, to keep getting caribous. I couldn't find any last year. (SRB&A Nuiqsut Interview November 2010)

The most common reasons cited for taking fewer trips were personal reasons, lack of transportation/equipment, and employment/lack of time (Table 25). Two individuals observed,

I was out most of the summer last summer. This summer I was doing less boating because I was working. (SRB&A Nuiqsut Interview November 2010)

It was less, because I had outboard trouble. I bought a new boat though so I will get to go all out [next summer]. (SRB&A Nuiqsut Interview November 2010)

One hunter reported taking fewer trips to hunt caribou in 2010 due to few caribou in the area, saying, "I didn't do that much hunting last year, there was no caribou. They all migrated west, there was hardly any" (SRB&A Nuiqsut Interview November 2010)

Table 25: Reasons for Decrease in Trip Frequency, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Personal Reasons	2	2	8
Lack of transportation/equipment	4	10	6
Employment/Lack of time	3	3	5
Moved out of area	0	0	1
Need less	0	1	0
Less Snow	1	0	0
Resource Availability	0	4	0

Stephen R. Braund & Associates, 2012

Changes in Trip Duration

Nuiqsut harvester respondents were less likely to report a change in their trip duration in Year 3, with 21 percent of harvester respondents reporting a change compared to 39 percent in Year 1 and 32 percent in Year 3 (Table 18). Nine percent of Year 3 respondents reported taking longer trips than in previous years, and 12 percent reported taking shorter trips. The percentage of respondents who reported taking longer trips was lower in Year 3 (nine percent) than in Year 1 (33 percent) and Year 2 (25 percent), Reason given for taking longer trips included "personal reasons", "worse success" and "travel farther to harvest resource" (Table 26).

Table 26: Type of Change in Trip Duration, Nuiqsut, Years 1-3

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

Stephen R. Braund & Associates, 2012

One individual said, "[We went] a little longer. [There were] no caribou, we were looking and looking and looking" (SRB&A Interview November 2010). Another individual simply indicated that he had traveled farther in Year 3 and therefore took longer trips, saying,

> *[My trips were] longer than normal because I was going farther. [They were] mostly day trips, except for the four to five day trips. I tried to make it all the way to Umiat, but gas was too expensive.* (SRB&A Nuiqsut Interview November 2010)

"Personal reasons" was most commonly given as a reason for taking longer trips (Table 27). Reasons given by respondents for making shorter trips were varied personal reasons including "lack of grub," the need to care for one's grandchildren, and a broken boat (Table 28). One respondent commented:

> *Usually we always stay up there five or six days, but this time we stayed a little less [than we did last year]. [Because] there was hardly any animals around.* (SRB&A Nuiqsut Interview November 2010)

Table 27: Reasons for Taking Longer Trips, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Personal Reasons	0	3	3
Worse success	0	0	1
Travel farther to harvest resource	1	1	1
Increased cost of living/expenses	0	1	0
More difficult	1	0	0
Helicopter Traffic Disturbance	2	0	0
Airplane Traffic Disturbance	2	0	0
Development	1	0	0
Resource Availability	4	3	0
Migration changed or diverted	5	0	0
Farther from riversides/farther inland	0	1	0

Stephen R. Braund & Associates, 2012

Table 28: Reasons for Taking Shorter Trips, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Personal Reasons	1	0	5
Lack of transportation/equipment	0	1	1
Resource Availability	0	0	1
Employment/Lack of time	1	1	0

Stephen R. Braund & Associates, 2012

Changes in Use Area

As shown in Table 18, 39 percent of harvester respondents reported that their hunting area had changed in Year 3 compared to the previous year, slightly higher than in Years 1 (31 percent) and 2 (28 percent). Fourteen percent of Nuiqsut caribou harvester respondents reported a general change in use area in Year 3, and 11 percent reported that, compared to the previous year, their Year 3 hunting area was smaller (Table 29).

Table 29: Type of Change in Use Area, Nuiqsut, Years 1-3

	Percentage of Respondents		
	Year 1	Year 2	Year 3
Use area changed	6%	19%	14%
Smaller hunting area	11%	0%	11%
Travel farther to harvest resource	14%	4%	5%
Expanded use area	0%	0%	7%
Change in timing of hunt	0%	2%	0%
Utilizing new or different areas	0%	0%	2%
Move to Different Areas	0%	2%	0%

Stephen R. Braund & Associates, 2012

"Personal reasons" was the most common explanation offered for a change in use area (Table 30). As one individual observed,

> *We usually go up Fish Creek for caribou, but we haven't gone this year. Last year I went once with my cousin [Name], but that's about it. I really don't like going to the ocean. To get to Fish Creek you have to cross this little bay right here, and if you get too close you are in shallow water all day long. I just don't have interest in the ocean. My buddy keeps trying to take me, but I say, 'No thank you.'* (SRB&A Nuiqsut Interview November 2010)

Table 30: Reasons Given for a Change in Use Area, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Personal Reasons	0	1	5
Better transportation/equipment	0	0	1
Lack of transportation/equipment	0	0	1
Shallower Rivers/Lakes	0	0	1
Employment/Lack of time	0	1	0
Increased cost of living/expenses	0	1	0
Climate affecting travel	0	2	0
Wind	0	1	0
Airplane Traffic Disturbance	1	0	0
Development	1	0	0
Resource Availability	1	1	0
Migration changed or diverted	1	2	0
Move to Different Areas	0	1	0
Change in distribution/migration	0	1	0

Stephen R. Braund & Associates, 2012.

In Year 3, "lack of transportation/equipment" was the most common reason for a change to a smaller use area, followed by "personal reasons" (Table 31). Two individuals indicated that they travelled in a smaller than usual area west of the community during the winter due to a lack of transportation:

> *Pretty much the same [areas as last year], only I didn't go very far this way [west] this year. No snow machine. Only when my friends call me to go out, and they have a spare snow machine would I go.* (SRB&A Nuiqsut Interview November 2010)

> *Yeah, I wasn't able to go out this way [west] because the snow machine wasn't running right. I just did that one trip on the snow machine.* (SRB&A Nuiqsut Interview November 2010)

Table 31: Reasons for Smaller Use Area, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Personal Reasons	1	0	2
Employment/Lack of time	1	0	0
Lack of transportation/equipment	2	0	4
Less Snow	1	0	0
Weather	0	0	1

Stephen R. Braund & Associates, 2012.

Changes in Hunting Months

Twelve percent of Nuiqsut caribou harvester respondents reported a change in their hunting months in Year 3, a somewhat smaller percentage than in previous years (Table 18). Reported changes included a later hunting season and, more generally, "harvest season changed" (Table 32). Reasons given for a later hunting season included "lack of transportation/equipment" and "employment/lack of time" (Table 33). Reasons given for a change in harvest season included "better transportation/equipment," "resource availability," and "moved out of area" (Table 34). Two individuals described,

> *I [usually] start earlier than that. I don't know, our boat didn't have a motor. I usually went with other people. I only went in our boat two or three times, checking the net or something.* (SRB&A Nuiqsut Interview November 2010)

> *I went out more in September this year because I bought a four-wheeler. I didn't get to go last year.* (SRB&A Nuiqsut Interview November 2010)

Table 32: Type of Change in Months of Harvest by Type of Change, Nuiqsut, Year 2 and Year 3

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

Stephen R. Braund & Associates, 2012

Table 33: Reasons Given for a Later Hunting Season, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Lack of transportation/equipment	1	0	2
Employment/Lack of time	0	0	1
Later Migration/Arrival	3	0	0

Stephen R. Braund & Associates, 2012

Table 34: Reasons Given for a Change in Harvest Season, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
Better transportation/equipment	0	0	2
Resource Availability	0	2	1
Moved out of area	0	0	1
Personal Reasons	0	2	0
Change in subsistence dependents	0	1	0
Lack of transportation/equipment	0	2	0
Airplane Traffic Disturbance	0	1	0

Stephen R. Braund & Associates, 2012

Harvested Enough Caribou

Twenty-one percent of Nuiqsut respondents indicated that they did not harvest enough caribou during Year 3, down from 56 percent in Year 2 and 49 percent in Year 1 (Table 18). The only reasons given for not getting enough caribou in Year 3 were "harvest less" and "sharing more" (Table 35). This is in contrast to Year 1 in which "migration changed or diverted," "helicopter traffic disturbance," and "development" were included among reasons given for not harvesting enough caribou. The difference between the three study years is due in part to a change in the study team's methods of coding responses to the question of whether a respondent harvested enough caribou. Respondents often indicated that the reason for not harvesting enough caribou was the same reason they provided for harvesting less caribou, in which case (in the case of Years 1 and 2), the study team used the same "why" code in response to both questions. Starting in Year 3, the study team coded residents' responses to reflect residents' actual statements (e.g., "because I harvested less" was coded as "harvest less" rather than as the reason given for harvesting less [e.g., "helicopter traffic"]).

Table 35: Reasons for Not Harvesting Enough Caribou, Nuiqsut, Years 1-3

	Percentage of Respondents		
	Year 1	Year 2	Year 3
Resource Availability	20%	23%	0%
Harvest less	0%	0%	12%
Migration changed or diverted	14%	4%	0%
Change in subsistence dependents	9%	2%	0%
Sharing More	0%	2%	2%
Employment/Lack of time	0%	4%	0%
Lack of transportation/equipment	6%	0%	0%
Helicopter Traffic Disturbance	6%	0%	0%
Development	6%	0%	0%
Personal Reasons	0%	2%	0%
Increased cost of living/expenses	0%	2%	0%
Traffic Disturbance	0%	2%	0%
Airplane Traffic Disturbance	3%	0%	0%
Air Traffic	3%	0%	0%

Stephen R. Braund & Associates, 2012

OBSERVATIONS OF HARVESTED CARIBOU HEALTH AND CONDITION

The number of respondents reporting one or more "abnormalities" in caribou was similar over the three study years, ranging between 20 and 23 respondents (Table 36). The percent of respondents reporting one or more "abnormalities", however, declined from 64 percent in Year 1 to 38 percent in Year 2 and 40 percent in Year 3 (Table 36). The two principle descriptors used to describe observed abnormalities during all study years are "health" and "size."

The Year 1 and Year 2 reports did not show the "total" number of caribou with one or more abnormalities. This was due to data entry methods that resulted in the same caribou begin counted more than once if they were reported for more than one type of abnormality (e.g., health *and* size). In Year 3, the study team reviewed all abnormality records from the three study years and reconciled duplicate records (e.g., one caribou reported for two different types of abnormalities and therefore counted twice) by reviewing the original maps and notes. The results show residents reporting observations in 70 caribou

in Year 1, 34 caribou in Year 2, and 37 caribou in Year 3 (Table 37). The percentage of abnormal caribou used by active harvester respondents was similar between Year 1 (67 percent), Year 2 (59 percent), and Year 3 (68 percent) (Table 37).

Table 36: Observations of Abnormalities in Harvested Caribou, Nuiqsut, Years 1-3[5]

	Number of Respondents			Percent of Respondents			Percent of Observations		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Health	17	14	10	28%	26%	18%	49%	54%	41%
Parasites	8	2	3	8%	4%	5%	18%	7%	9%
Quality	3	2	2	6%	4%	4%	7%	7%	6%
Size	11	7	10	28%	13%	18%	24%	25%	44%
Other	1	2	0	0%	4%	0%	2%	7%	0%
One or More Abnormalities	23	20	23	64%	38%	40%	100%	100%	100%

Notes: Health observations include observations of disease, infections, or abnormally colored meat; parasite observations include observations related to increased or decreased parasite loads (e.g., larvae, nose bots) or unusual types of parasites; quality observations include observations of unusual taste or smell; and size observations include observations related to fat content or overall size (i.e., height).

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Table 37: Number of Abnormal Caribou by Type of Abnormality, Nuiqsut, Years 1-3

	Number of Abnormal Caribou			Number (%) of Abnormal Caribou Used		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Health	25	16	15	4 (16%)	4 (25%)	2 (13%)
Other	1	2	0	0 (0%)	2 (100%)	0 (0%)
Parasites	13	5	8	11 (85%)	5 (100%)	7 (88%)
Quality	3	2	2	2 (67%)	1 (50%)	2 (100%)
Size	42	9	17	39 (93%)	8 (89%)	15 (18%)
One or More Abnormalities	70	34	37	47 (67%)	20 (59%)	25 (68%)

Stephen R. Braund & Associates, 2012

As in the case of Year 1 and Year 2, "disease/infection" was the most common observation reported by respondents in Year 3 (Table 38). Several respondents described harvesting caribou with green-colored meat:

> *Yeah, some were [sick] except I usually cut off what the green stuff is; parts of it are good. I don't try and throw everything away. When the liver is good the caribou is good. If there's white [on the liver], I don't bother with it. I try and teach my boys that.* (SRB&A Nuiqsut Interview November 2010)

> *Sigaluk, we harvested one on a little island. But after we started skinning, it had some green on its back. It was all alone on that island; it didn't want to move or anything. The outer layer was green. I've only seen it two times.* (SRB&A Nuiqsut Interview November 2010)

[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.

We got the sick one right there and my buddy noticed there was some green meat so we laid it out for scavengers to eat. The green meat was on the hindquarter. We just finished gutting it and left it. (SRB&A Nuiqsut Interview November 2010)

There was one or two we got that was kind of slimy and a little bit of greenish meat. (SRB&A Nuiqsut Interview November 2010)

Table 38: Perceived Reasons for Abnormality, Nuiqsut, Year 3

	Number of Observations		
	Year 1	Year 2	Year 3
Disease/Infection	22	11	13
Decrease in Resource Size	10	7	10
Increase in Resource Size	1	0	4
Change in resource quality	0	0	2
Fewer Parasites	5	0	2
More Parasites	3	1	1
New Species in Region	0	1	0
Abnormal Resource Death	1	0	0
Physical Abnormalities	0	3	0
Change in Texture of Meat	0	3	0
Parasites	0	1	0
Change in Smell of Meat	2	1	0
Taste	1	0	0

Stephen R. Braund & Associates, 2012

Other observations included diseased livers and/or pockets of pus found when butchering, with two individuals observing,

In August, well, before August with my cousin, we had caught right on the right side of that island, that's where we caught two of them at the shoreline. One of them was sick. They were both males. That was the end of July. The liver was black, really black. We brought it home showed it to my dad; he said it was sick and called his cousin and told him about it, and we knew it was sick so we threw it out. (SRB&A Nuiqsut Interview November 2010)

Matter of fact, where I caught the two of them over here at this one I caught two of them over here, and one of them was sick. It had pus in it. So I left that one and took one. It had pus on the liver and stuff. [I did not notice] until I butchered it and took the hide off, so I just left it…. There was a time a couple of years ago when a caribou had pus on the rear leg that seemed to be pretty similar. Yellow pus comes out like thick milk or something. (SRB&A Nuiqsut Interview November 2010)

When asked to provide explanations for disease/infection, residents most commonly responded that they did not know the cause of the observed sickness (Table 39). However, certain individuals believed that contamination (either through air pollution, oil spills, or human waste) had affected the health of the caribou:

Well, when we first got here, all this – before Alpine, before they [industry] started going west, everything [ground cover] was green all this time. Now, there is less green, and then it turns brown. It is turning brown with all this pollution. It doesn't just stay up on the air, it floats down. That's a big difference from 1973. That's what worries me most… all that pollution doesn't just float away. All of it comes down, and it gets contaminated. That's what worries me. They graze on land. (SRB&A Nuiqsut Interview November 2010)

I don't know from what, maybe the impact of the pollution or something…. But when I [hunted there] I kind of did a whole day scout; in a couple of creeks, there was some discoloration on the grounds, like it was kind of inside the mouth of the creek. I don't know if that has the caribous involved in that, I noticed [it] when I was walking. (SRB&A Nuiqsut Interview November 2010)

I have no idea, it could be from the pollution. You can see pollution going along whichever the wind direction is. That's where the caribou eats. Because pollution air going to flow around all over. One time I saw the haze go lower over the airport, just a little line. (SRB&A Nuiqsut Interview November 2010)

They could be getting sick from the oil spills around Prudhoe Bay area. There was that one ¼ million gallons, that's a lot. There could be more undetected oil spills. They need to improve the pipeline going down [to] Valdez. The main thing I wanted to report was that one sick one. Everything else was good. Just that the liver was black. (SRB&A Nuiqsut Interview November 2010)

Table 39: Perceived Reasons for Disease/Infection, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
I don't know	12	4	6
Contamination from air pollution	4	3	3
Resource Injury	1	3	2
Not ascertained	2	2	1
Oil Spill Contamination	1		1
Concern of Contaminants	1		
Change in Feeding	1		
Change in Food Availability	1		
Development	1		
Contamination		1	
Predators		1	
Human Waste/Pollution			1

Another respondent believed that the environment in their caribou hunting areas was uncontaminated and therefore could not provide an explanation for the diseased caribou they had harvested, saying, "I have no idea what would cause that. It's just the environment up here is so clean I couldn't imagine what would cause that" (SRB&A Nuiqsut Interview November 2010).

A decrease in resource size was also mentioned in 10 instances (Table 38). In several cases, when citing disease/infection, residents indicated that the caribou was also unusually thin. One individual indicated that many of the caribou he observed during the Year 3 hunting season had seemed smaller than usual, saying,

They were kind of small. Smaller than the real big bulls I used to get. I don't know, it's either we got the last of the herd or else they were lost caribous. There weren't a whole bunch, just a few of them. There were like 10 or 12 [of them], just a few. These ones [at another location] were pretty big, but the rest were kind of small. All the big ones went this way [northeast], and we missed them. (SRB&A Nuiqsut Interview November 2010)

When asked why a decrease in resource size might have occurred, respondents most commonly responded, "I don't know," but others offered a variety of possible explanations including "warmer temperatures," "air traffic," "contamination from air pollution," "more parasites," and "natural causes"

(Table 40). One individual provided four observations of increase in resource size in Year 3 (Table 38), indicating that all of the caribou he had harvested were "fatter" than usual. He did not provide an explanation for this change.

Table 40: Perceived Reasons for Decrease in Resource Size, Years 1-3

	Number of Observations		
	Year 1	Year 2	Year 3
I Do not Know	1	2	6
Warmer Temperatures	0	0	1
Air Traffic	0	0	1
Contamination from air pollution	0	0	1
More Parasites	0	0	1
Natural causes	0	2	1
Airplane Traffic Disturbance	0	1	0
Resource in Smaller Groups	0	1	0

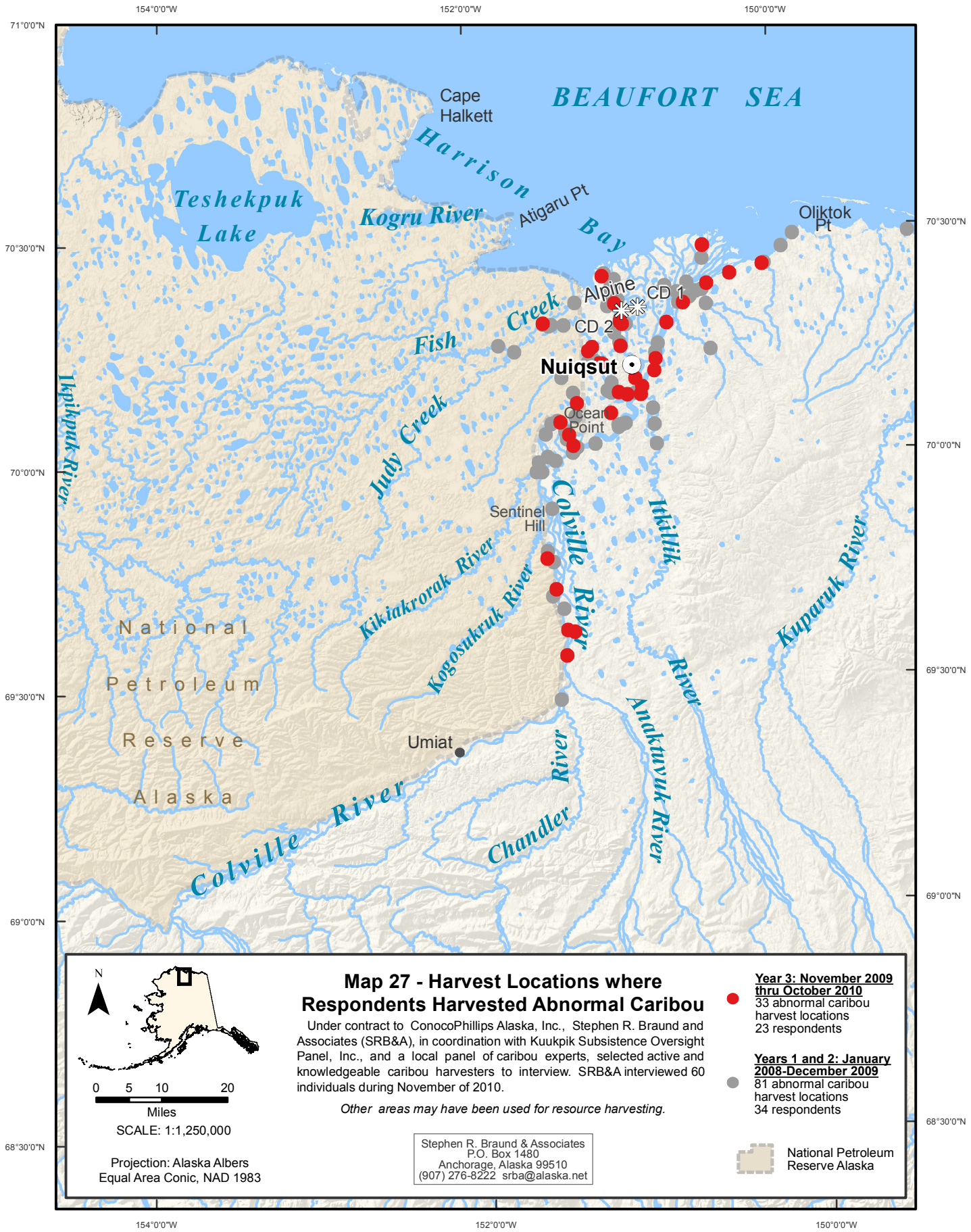
Stephen R. Braund & Associates, 2012

The locations where Year 3 respondents reported harvesting caribou they perceived to be abnormal are depicted in red on Map 27, and locations identified during previous study years are shown in gray. For the Year 3 time period, respondents reported harvesting "abnormal" caribou along the Colville River, including Nigliq Channel, in several overland locations west of the community, and near Fish Creek. The majority of harvest locations for caribou reported as "abnormal" occur from Ocean Point north.

IMPACTS ON HARVESTING ACTIVITIES

Sixty-one percent of harvester respondents in Year 3 reported one or more Alpine-related impacts on caribou hunting (Table 41). This compares with 83 percent of respondents in Year 1 and 70 percent of respondents in Year 2. The higher percentage of study participants reporting impacts in 2008 (Year 1) is due in part to researchers allowing Year 1 respondents to describe impacts that had occurred since the Alpine development had begun. During Years 2 and 3, researchers tried to document only impacts that had occurred during the respective study time period.

As in the case of Year 1 and Year 2, the most commonly reported impact is associated with helicopter traffic, with 51 percent of harvester respondents reporting helicopter traffic impacts in Year 3. These observations account for almost half (48 percent) of all impact observations in Year 3 (Table 41). Helicopter traffic accounted for a greater portion of all impact observations in Year 3. There has been a marked decrease in reports of impacts of man-made structures, from 67 percent of respondents in Year 1, to 34 percent in Year 2, and 9 percent in Year 3. Plane traffic impacts were reported by half as many harvester respondents in Year 3 as in Year 1 (21 percent versus 53 percent), but accounted for a similar percentage of all observations during the three study years (between 20 and 25 percent). Only two percent of respondents reported impacts from "other traffic" (i.e., airboats) in Year 3, compared to 19 percent in Year 2 and 28 percent in Year 1 (Table 41). The study team added "seismic lines or activity" as a cued impact starting in Year 2. The percentage of respondents reporting impacts from seismic lines or activity increased from 13 percent of respondents in Year 2 to 18 percent of respondents in Year 3. Again, the higher percentage of man-made structure, airplane, and other impacts in Year 1 may be due to respondents reporting more general impacts on caribou hunting and/or movement since the Alpine development began.



Map 27 - Harvest Locations where Respondents Harvested Abnormal Caribou

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 60 individuals during November of 2010.

Other areas may have been used for resource harvesting.

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Year 3: November 2009 thru October 2010
33 abnormal caribou harvest locations
23 respondents

Years 1 and 2: January 2008-December 2009
81 abnormal caribou harvest locations
34 respondents

National Petroleum Reserve Alaska

Table 41: Respondent Reported Alpine-Related Impacts on Caribou Hunting, Nuiqsut, Years 1-3

	Percent of Respondents			Percent of Observations		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Helicopter traffic	69%	49%	51%	27%	28%	48%
Plane traffic	53%	38%	21%	25%	22%	20%
Other traffic	28%	19%	2%	10%	11%	2%
Oil company personnel	6%	2%	4%	2%	1%	3%
Man-made structures	67%	34%	9%	27%	22%	8%
Regulations	17%	11%	0%	6%	6%	0%
Seismic lines or activity	0%	13%	18%	0%	8%	17%
Other	14%	6%	2%	5%	3%	2%
Any Impact	83%	70%	61%			
Totals	100%	100%	100%	100%	100%	100%
Number of Respondents/Observations	36	53	57	105	93	60

Stephen R. Braund & Associates, 2012.

Figure 8 show the number of reported impacts on caribou hunting of all types by month for the three study years, and Figures 9 through 14 show individual impact reports by month for the three study years. The peak months for reported impacts in all three years are June, July, and August, the same months as peak caribou hunting activity (Figure 5). Helicopter and airplane impacts account for most of all reported impacts and occur primarily from June through September (Figures 9 and 10). Reported impacts associated with seismic activities and oil company personnel were more likely to occur during the winter months (Figures 11 and 14).

Figure 8: Reported Impacts by Month, Years 1-3

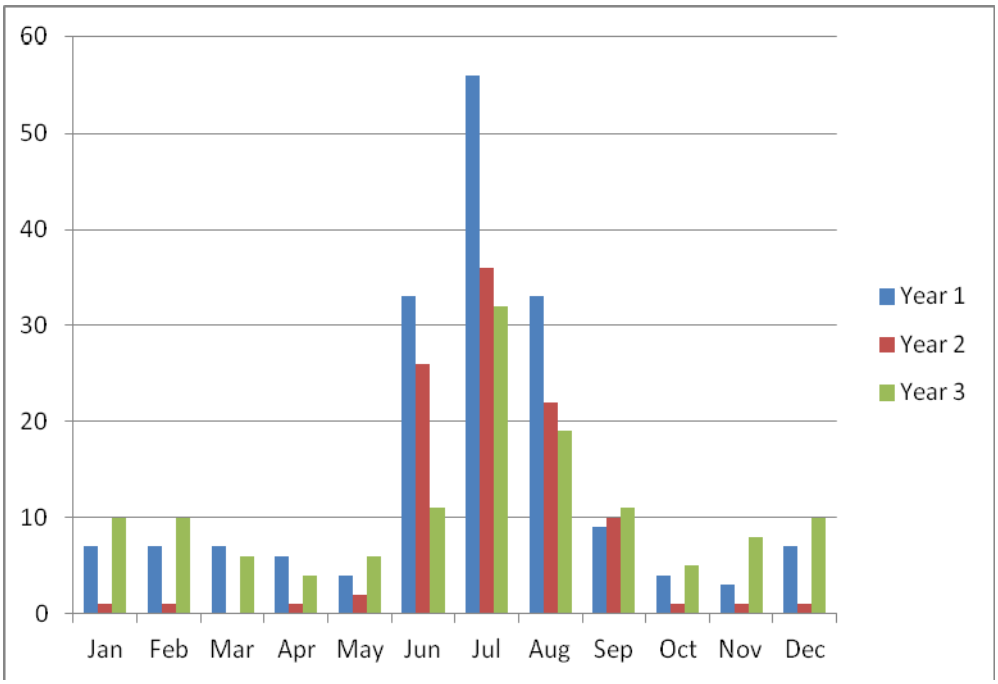


Figure 9: Reported Helicopter Impacts on Caribou Harvest Activities by Month: Years 1-3

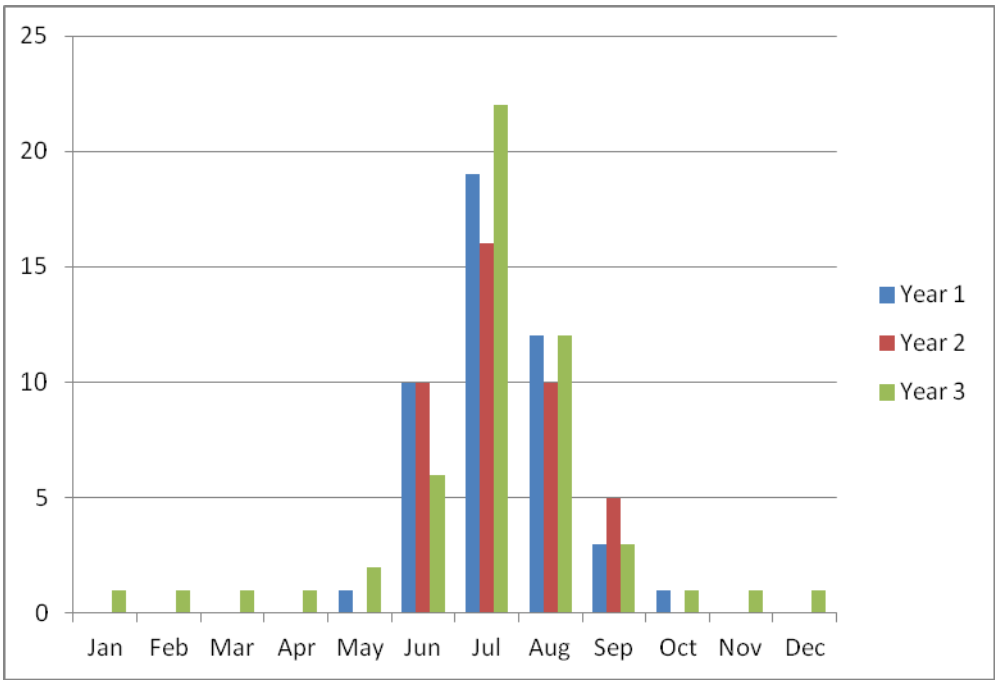


Figure 10: Reported Airplane Impacts on Caribou Harvest Activities by Month: Years 1-3

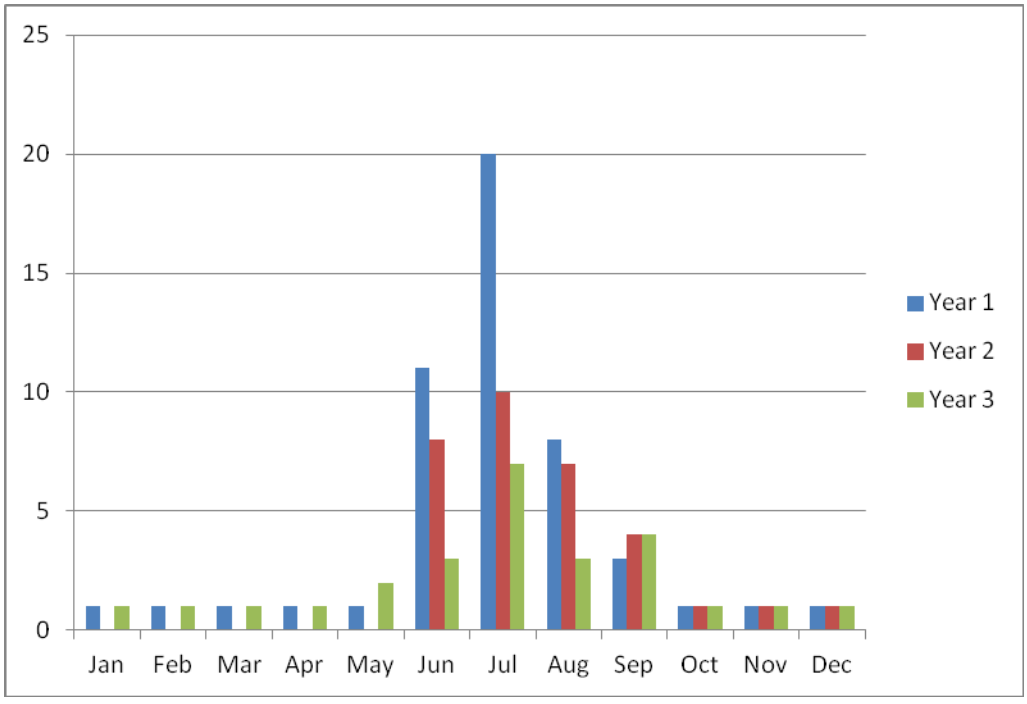


Figure 11: Reported Oil Company Personnel Impacts by Month

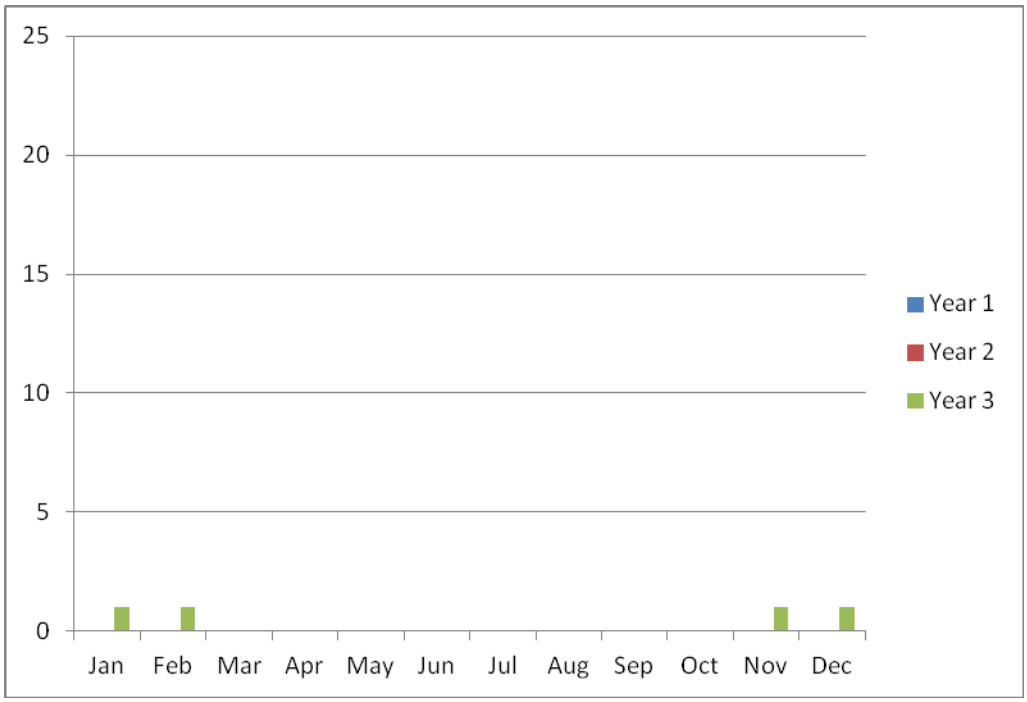


Figure 12: Reported Man-Made Structure Impacts by Month, Years 1-3

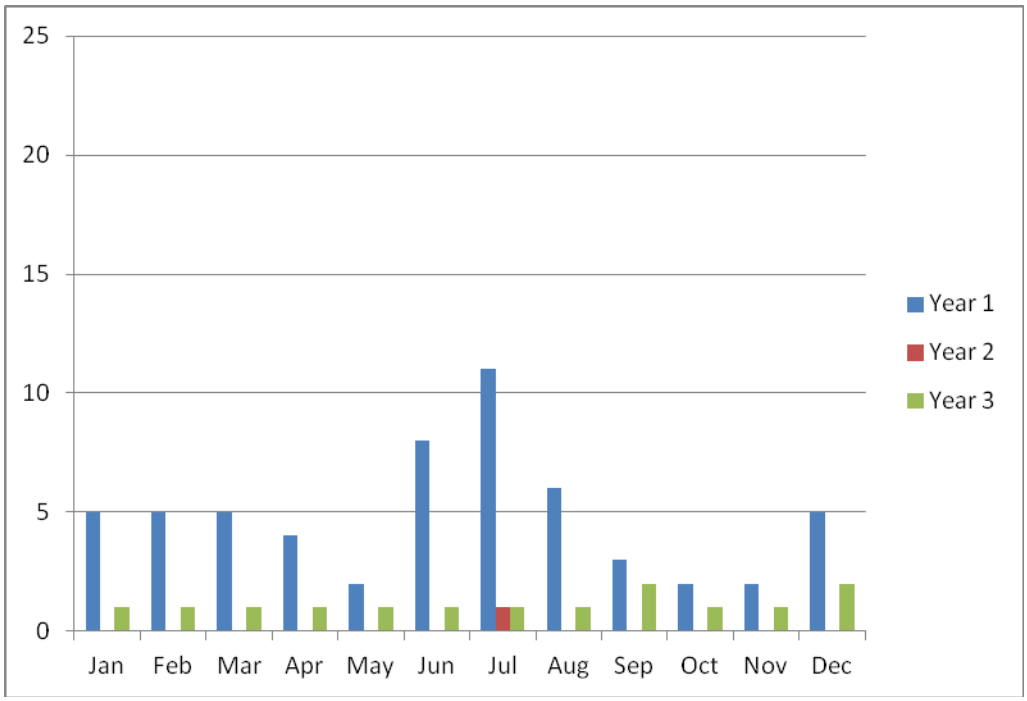


Figure 13: Reported Regulation Impacts by Month, Years 1-3

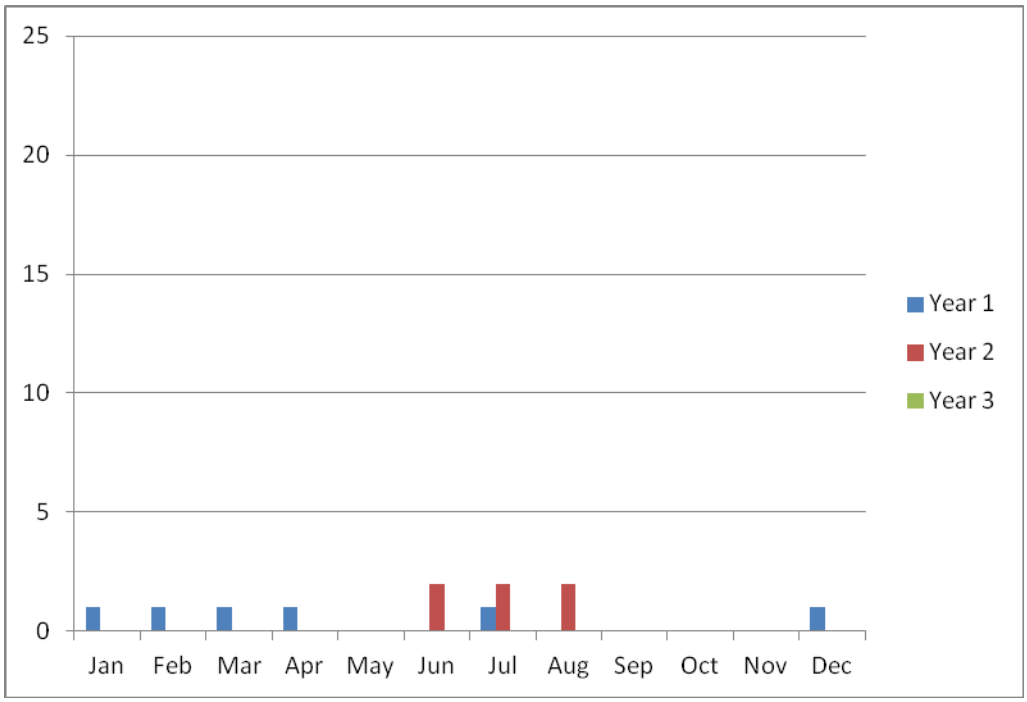
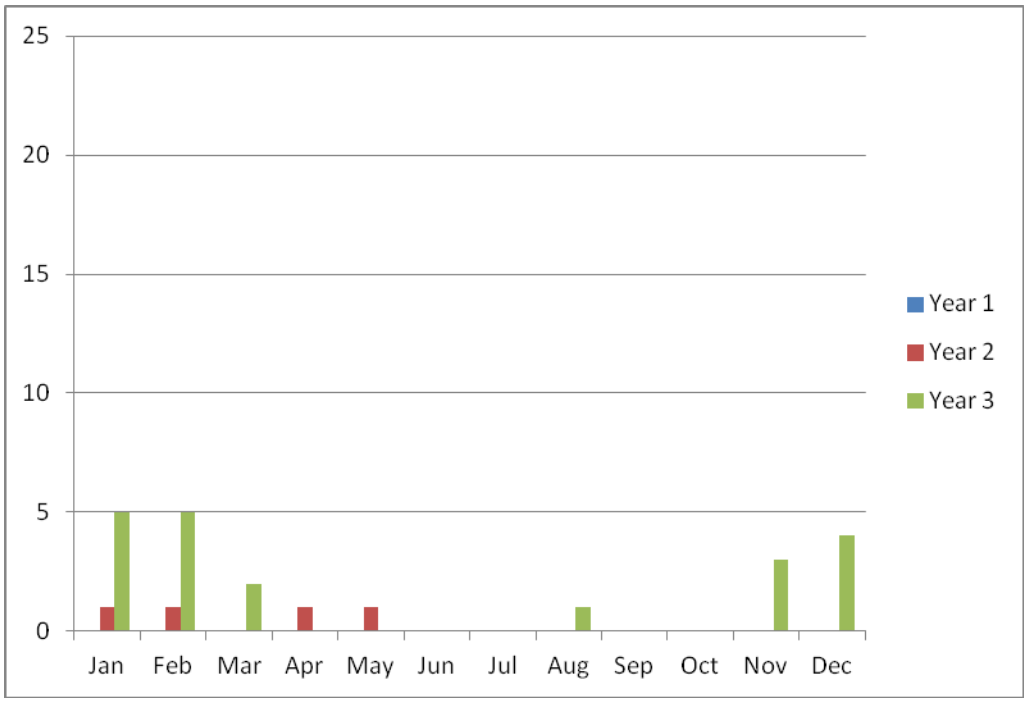


Figure 14: Reported Seismic Line and Activity Impacts by Month, Years 1-3



Map 28 shows the locations of impacts reported by Year 3 harvester respondents. The study team recorded impact locations only when the respondent could identify the specific (i.e., point) location where they were when the impact occurred. The majority of reported impacts occurred along Nigliq Channel; however, impacts were also reported on the east channel (helicopter impacts), along the pipeline east of the community (structure impact), near the mouth of Itkillik River (seismic and helicopter impacts), and west and south of the Nigliq Channel of the community (helicopter, plane, and personnel impacts). Along Nigliq Channel, residents reported helicopter, plane, and seismic impacts, with a high concentration of impacts reported near Nigliq/Woods Camp, where residents frequently stay to harvest fish and wait for the caribou to cross during the summer months.

Impacts of Helicopter Traffic

As shown in Table 41, 51 percent of respondents reported helicopter impacts in Year 3, similar to Year 2 (49 percent) and somewhat lower than in Year 1 (69 percent). Helicopter impacts accounted for 48 percent of reported impacts in Year 3. In 10 cases, respondents were unable to identify the owner of the helicopter or provide a description of the helicopter's appearance (Table 42). In eight cases, residents indicated that the impact involved a blue and white helicopter; other descriptors used by respondents more than once included "Alpine Helicopter," and "Air Logistics Helicopter." Helicopter impacts were reported along and west of Nigliq Channel, along the East Channel of the Colville River, and south of the community near the mouth of the Itkillik River.

During the Year 3 interviews, a number of Nuiqsut caribou harvester respondents referred to an incident during the summer of 2010, in which heavy helicopter traffic associated with the Alpine development diverted the caribou herds as they migrated towards Nigliq Channel. Complaints were made to the North Slope Borough and to CPAI, resulting in a community meeting to resolve the issues surrounding the helicopter disturbances.

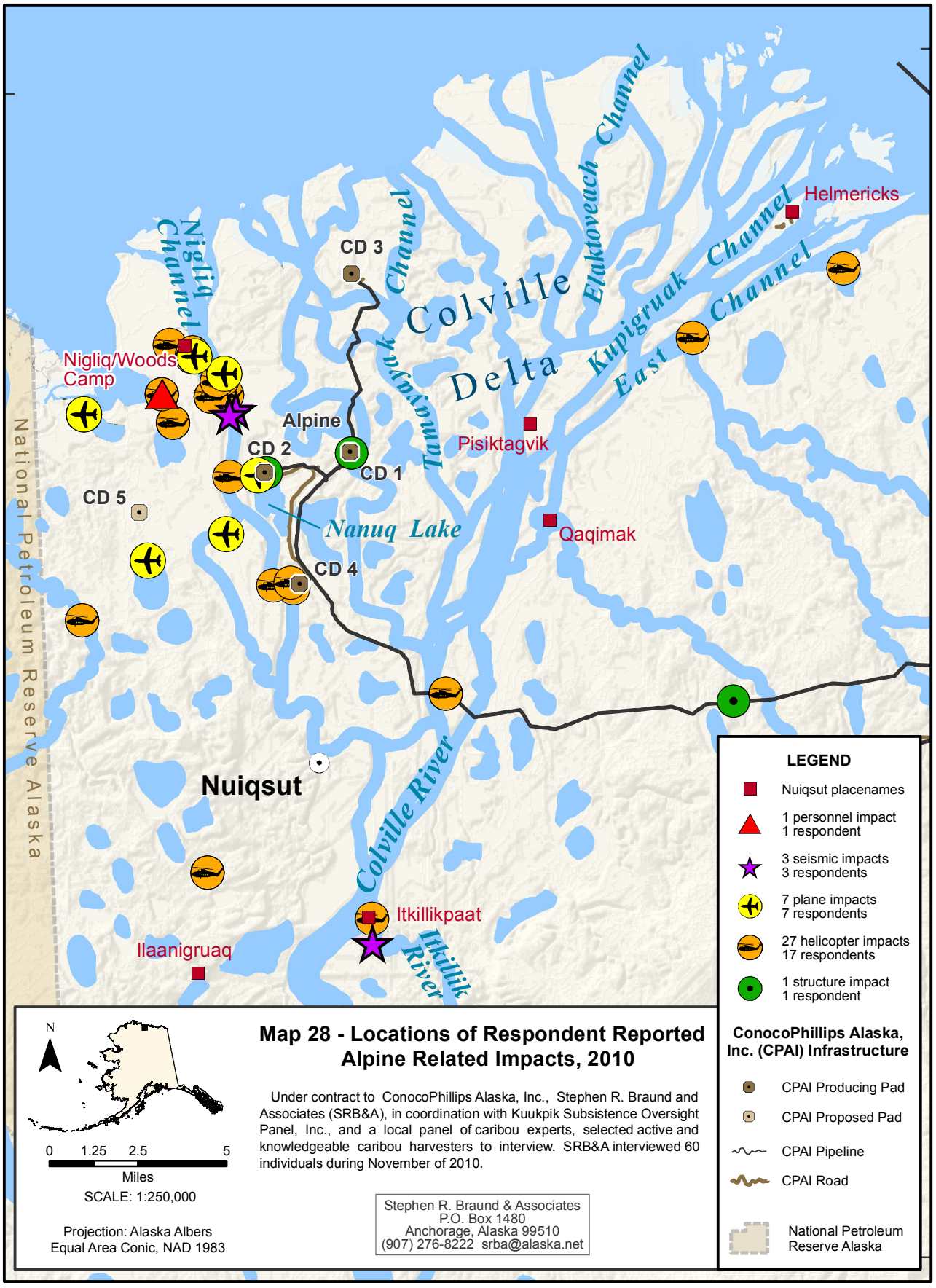
Table 42: Respondent Descriptions of Helicopters Associated with Impacts, Nuiqsut, Year 3

	Number of Observations
Helicopters - Unknown Owner	10
Blue and White Helicopter	8
Alpine Helicopter	4
Air Logistics Helicopter	4
Conoco Phillips Helicopter	1
Helicopter For Scientific Studies	1
Red Helicopter	1

Stephen R. Braund & Associates, 2012

When asked whether the issues were adequately resolved, a number of individuals responded positively, indicating that normal caribou hunting activities resumed following the meeting in July or August. Several respondents described the experience as follows:

> *There were a lot of complaints [for] a couple of years from local hunters about one helicopter that comes out of Alpine, CD1. It was from Alpine, the blue and white color that you usually see from there. That was in about the end of July, somewhere around there. We told them how many times not to be flying around during summertime; when it's hot, that helicopter starts going around. There was a herd coming in from the west and that helicopter started flying around and chasing them away. That's when people started complaining about that helicopter. People had to call the Wildlife Department in*



Map 28 - Locations of Respondent Reported Alpine Related Impacts, 2010

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 60 individuals during November of 2010.

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Barrow. After they had that meeting to stop their flying around, we were able to catch caribou. (SRB&A Nuiqsut Interview November 2010)

When I was heading out to the ocean, my brother called in and said there were 400 caribou coming our way and a couple of choppers with them. I called that in and they had a meeting for local people to come in and meet with them. (SRB&A Nuiqsut Interview November 2010)

The only time we got any [caribou] *me and my son and brother got seven of them up there. But that was after the caribou were harassed by the choppers, and we had to meet with ConocoPhillips to find a solution about being harassed by the helicopters when they were cleaning up the seismic that they just did around Nanuq. Well, yes, Nuiqsut has been harassed so long by choppers; it is time for us to harass them back. …. That's the biggest impact we had [this year].* (SRB&A Nuiqsut Interview November 2010)

In addition, during the Year 3 draft review meeting with the caribou panel, one panel member noted that air traffic associated with Alpine and other satellite developments started to improve during Year 3, saying, "On the third year of this study we have seen less air traffic on the west side. Conoco started to listen" (SRB&A Nuiqsut Caribou Panel Meeting May 2012). Residents generally indicated that helicopter traffic resulted in caribou acting spooked, being diverted from their migratory path toward another direction, or kept from crossing local rivers where hunters waited for them. A number of individuals cited specific instances in which helicopter diverted caribou they had been pursuing:

One of them [impacts] was a helicopter. They were doing survey or something. I was trying to catch some caribou, they went right up to the herd and scared them off. That was the first week I got there. They already had crossed, and I was waiting for them to come back when the helicopter came back and scared them. It came from that area. It bummed me out because I had to wait another whole day for those caribou to come back. (SRB&A Nuiqsut Interview November 2010)

Yeah, the chopper flying too low a couple of times. I know exactly where I was on Nigliq Channel, right across from those spilled Conexes. Oh man, I remember being real upset about that one, about August I think. We were actually waiting for the herd of caribou when we heard it. Right across the river, and then it would come right back. The caribou started taking off the other way. Even Helmrichs plane would go out. It was a blue and white [helicopter]. We ended up calling about it too. And they talked to them. We were like, 'Your helicopter was flying way too low, and we had been waiting. This is pretty much bologna. We are trying to hunt, and you are scaring our food.' (SRB&A Nuiqsut Interview November 2010)

[There was] helicopter traffic downriver near the creek. It would be in between [the main channel and the slough]. The helicopter was flying too low as the caribou were approaching. It just spooked them. It was foggy. That was in August. (SRB&A Nuiqsut Interview November 2010)

There's more choppers, too, because we were way up here, and we were over here waiting, and it scared them all over this way, and they all went around. We went all the way around and then they popped back up. Like blue and white I think it was, real big ones that usually comes around here all summer. (SRB&A Nuiqsut Interview November 2010)

No [caribou]; there were other hunters around and scattered them, and helicopters were around and scattered them too. I think [it was] in July. We were waiting for them [caribou] and [the helicopter] came around there and scared them back in[land]. (SRB&A Nuiqsut Interview November 2010)

A lot of times when I was going up here the chopper activity kept scaring them [caribou] away. CD4. Right up here. I almost caught them twice, but the helicopter scared the caribou when they were coming towards us. It went up circled around us a couple of times. (SRB&A Nuiqsut Interview November 2010)

As noted above, residents indicated that the meetings between the community and CPAI helped lessen the impacts on caribou hunters. Several respondents provided the following descriptions of the outcome of the meeting:

> *They decided to do the cleanup at the end of the year before the ground freezes after the caribou hunting. They [CPAI] suggested that [they] do the clean up on the off season, when the hunters and the workers aren't getting in each other's way. That was the only suggestion they made. Which wouldn't be a bad idea. But the thing is if they don't do the cleanup right at breakup time, the company gets fined for the trash they leave out there until they clean it up. It's a really critical thing. It's going to be interesting what they come up with. Seismic is going to be here year after year after year… there's going to have to be a cleanup afterwards.* (SRB&A Nuiqsut Interview November 2010)

> *We set up a meeting, and the solution is to have better communication and have monitors go along on the clean ups and have them fly at night time. It doesn't get dark anyways in July.* (SRB&A Nuiqsut Interview November 2010)

> *I told them that they need to cease their activities and let the people harvest [caribou], so they agreed to move their studies away from the hunting area. You had so much stuff going on that summer. They were doing site clearance cleaning up from previous activities like seismic. There was a lot of conflict that I know of.* (SRB&A Nuiqsut Interview November 2010)

In addition, residents provided suggestions for methods to mitigate future impacts from helicopter traffic, including flying at a higher altitude, modifying helicopter routes to follow the coastline or to avoid caribou herds when spotted, and implement real time communication between hunters and CPAI. Residents provided the following comments regarding potential mitigation:

> *I think it would be better if they [the helicopters] went up on the coast; then they wouldn't scare them as much inland. It would be better to go on the coastline; it would be about the same amount of time.* (SRB&A Nuiqsut Interview November 2010)

> *It's one thing to put it on paper; it would be better to have real time communication.* (SRB&A Nuiqsut Interview November 2010)

> *They [helicopters] should just leave [the caribou] alone. If they see caribou, they should not circle back.* (SRB&A Nuiqsut Interview November 2010)

> *When the caribou are around, they [helicopter pilots] should observe and go around [them], like as far as they can. Can't do much about the plane [changing routes].* (SRB&A Nuiqsut Interview November 2010)

Impacts of Airplane Traffic

Airplane traffic was the second most commonly reported impact during the Year 3 active harvester interviews. Twenty-one percent of harvester respondents reported experiencing impacts related to plane traffic, and plane traffic accounted for 20 percent of all impact observations (Table 41). Residents commonly cited a combination of helicopter and plane traffic as a general source of disturbance during their caribou hunting activities. Others cited specific instances where airplane traffic affected their caribou hunting activities. As shown on Map 28, airplane impacts were reported at several locations along Nigliq Channel and west of Nigliq Channel towards Fish Creek. Several individuals noted impacts related to a cargo plane (Table 43) that lands at Alpine on a frequent basis:

> *The only problem that they have during summertime is all the material…a cargo plane sometimes…they kind of scare the caribou away. I don't know how many times a week they make that trip. It flies over the Nigliq Channel and the Colville. Seems like it comes from the west towards us and then to Alpine.* (SRB&A Nuiqsut Interview November 2010)

The big Hercules plane was coming out of Alpine, and it went right over us; the caribou almost got spooked, but we got lucky and they stayed. The airstrip comes this way, and that was the reason they [caribou] went around [and crossed the river]. (SRB&A Nuiqsut Interview November 2010)

Some caribou are really sensitive to noise sound, like planes, you know. That Alpine plane that comes along [cargo]. [The impact was] probably just throughout the summer. On Nigliq Channel we used to see lots [of caribou], but hardly anything this summer, you know. Some people go to Fish Creek, and there's a lot of caribou up there. It really affects us when there's a low flying plane. It diverts the caribou, you know. The caribou used to migrate right through here, now they are migrating further south. (SRB&A Nuiqsut Interview November 2010)

Table 43: Descriptions of Airplanes Associated with Airplane Traffic Impacts, Nuiqsut Year 3

	Number of Observations
Cargo Airplane	4
Supercub	2
Airplane - Unknown Owner	2
Alpine Airplane	1
Cessna	1
Twin Otter	1
Conoco Airplane	1

Stephen R. Braund & Associates, 2012

Impacts of Regulations

No respondents reported impacts related to regulations in Year 3, compared to 17 percent in Year 1 and 11 percent in Year 2 (Table 41).

Impacts of Man-made Structures

Impacts related to man-made structures were reported by nine percent of Year 3 respondents, compared to 67 percent in Year 1 and 34 percent in Year 2 (Table 41). 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 resulted in general changes to the caribou migration. Years 2 and 3 active harvester interviews focused on recording impacts that occurred during the study time period and that directly affected caribou harvesters.

Those individuals reporting impacts from man-made structures in Year 3 cited pipelines, ice roads/bridges, and infrastructure (Table 44). Residents either reported impacts on caribou movement (e.g., pipelines blocking or impeding caribou migrations and ultimately affecting resource availability) or impacts on hunting activities due to decreased access to caribou near project infrastructure:

The ice road – [they] don't allow you to hunt around there. We see caribou sometimes around there, right around the Alpine. We used to see herds of thousands of them come up through here, but with all these pipelines and oilfields…I don't know. I know it's not safe to hunt around there when there's pipelines and stuff. There are security trucks on the ice road. (SRB&A Nuiqsut Interview November 2010)

During the winter by the pipeline on the ice road the caribou go under the pipeline, and we can't shoot them. It's parallel to the road. I have to walk to the pipeline and shoot out towards the road because I can't shoot towards the pipeline. [The caribou were] 500 or 600 yards [from the road at the place where I was getting them. (SRB&A Nuiqsut Interview November 2010)

Just recently the herd went through the village, right before freeze up. Everybody woke up to a herd just passing through. They had a hard time passing the Alpine [development]. They were confused, and then they finally made it through. About the third week of September. They were getting confused around there, and then they finally went through [to the] west. (SRB&A Nuiqsut Interview November 2010)

Table 44: Descriptions of Sources of Man-Made Structures Associated with Impacts, Nuiqsut, Year 3

	Number of Observations
Pipeline	2
Ice Roads and Bridges	2
Infrastructure	1

Stephen R. Braund & Associates, 2012

One respondent noted that some caribou tend to congregate near Alpine facilities, with the caribou reportedly having learned that they are safe in these areas from hunters and other threats. While this individual acknowledged that CPAI allows hunting near project infrastructure, hunters generally avoid those areas due to concerns about shooting near pipelines and/or populated areas. This individual described,

The pipeline, the pads I would say [have been an impact]. The caribou see it as safety. The coastal ones will come as close to CD3 as they can, and the roadways they will hang around, and the pipeline, year-round. Caribou are smart; they know they are not going to be shot on those sites. The company tells us we can hunt in the area, but for safety you don't want to risk it. [It results in] displacement to hunters. (SRB&A Nuiqsut Interview November 2010)

This respondent went on to provide the following suggestion for how the above impacts could be mitigated:

Maybe the company can give their workers a break to scare them away, not just let them hang out [near facilities]. That would be okay with me; I know company policy is that employees are not allowed to disturb wildlife, but it wouldn't bother me one bit if they could shoo them away from the pads. (SRB&A Nuiqsut Interview November 2010)

Impacts of Other Traffic

Only two percent of Nuiqsut active harvester respondents (one respondent) reported impacts related to "other traffic" (usually referring to airboats) in Year 3 (Table 41). Previous study years show a higher percentage of respondents reporting impacts associated with other traffic (28 percent in Year 1 and 19 percent in Year 2). The one respondent who reported other traffic impacts in Year 3 cited airboats as the source of the impact (Table 45). This hunter described,

Actually we were being impacted by Alpine, because we have a camp just north of CD2 just here, and we were waiting on a herd that was at least 100 or 200, and we stayed at the camp for a week waiting for them to cross, but every time there were airboats heading out, and it diverted them away. They [caribou] never did cross. They [airboats] are always a problem. You can hear them for miles. From Alpine to CD north. [Starting in] July and they go through freeze-up. [They should] do away with the airboats and use just a normal jet boat. (SRB&A Nuiqsut Interview November 2010)

Table 45: Sources of Other Traffic Impacts, Nuiqsut, Year 3

	Number of Observations
Airboats	1

Stephen R. Braund & Associates, 2012

Impacts of Seismic Lines and Activity

The percentage of harvester respondents reporting associated with seismic lines and activity rose from 13 percent in Year 2 to 18 percent in Year 3 (seismic impacts were not cued in Year 1) (Table 41). Seismic impacts accounted for 17 percent of all reported Year 3 impacts. Residents reported seismic impacts occurring along Nigliq Channel north of CD 2 and near the mouth of the Itkillik River; residents were unable to pinpoint the location of seismic impacts in a number of cases. A number of individuals noted that the increased helicopter activity during summer 2010 was associated with seismic clean-up activities (see descriptions of these observations under "Impacts of Helicopter Traffic"). In addition, a number of respondents described encountering seismic lines during their travels, primarily during the winter; in some cases, this resulted in residents having to travel farther in order to avoid crossing the lines:

> *This whole thing was covered with seismic traps up here. This whole area was covered with seismic (north). For the safety of our wheels [on four-wheelers] we don't go through the area; we don't want to hit the lines. I have caught a caribou that had wires on its head before.* (SRB&A Nuiqsut Interview November 2010)

> *There was too much, it was a rough ride – they have their tracks set at so many hundred feet. A lot of activity, and no caribou.* (SRB&A Nuiqsut Interview November 2010)

> *Sometimes we have to go around them [seismic lines]. They do long wires. We don't want to go over them. Southeast of [CD 1 and 2 and] … I was up by Nigliq and there were a lot of them. On both sides.* (SRB&A Nuiqsut Interview November 2010)

> *Once I start seeing lines, I just go the other way. If I see them I try to avoid them. They were in this area [Fish Creek]. I just try and go around them and look around. I usually try to stay away from them [seismic lines] at that time. I don't have to worry about my bullet heading towards it if it's there. We just worry about the lines getting in the snow machine tracks.* (SRB&A Nuiqsut Interview November 2010)

One individual reported observing seismic cables during the summer months after CPAI cleanup activities, saying,

> *They leave a lot of cable out there though, a lot. They just leave it, they don't pick it back up. That was in between Nigliq and Nanuq. There was like 200 feet of cable out there, on the east side. During the rutting season, it would be bad to see caribou run on the wire and get it stuck on its head…. Is there anybody to talk to about them leaving seismic cables out there?* (SRB&A Nuiqsut Interview November 2010)

CPAI has reported that it is their practice to retrieve all seismic cables by the end of the season, which may extend into early May or as late as June if the cables are frozen into ice roads. Additional cleanup of debris occurs into July and August; it is unclear whether the abovementioned seismic cables had not been retrieved by CPAI or if they were remnants of previous seismic activities in the region.

Two respondents believed that seismic activities during the winter of 2010 had affected the distribution of caribou and lessened their availability in the Nuiqsut area:

> *Seems like last winter there was hardly any caribou around the Alpine areas. But the year before there was lots. Last year there was hardly any. I think they go eat somewhere else, maybe around here [pointing on map]…. Last year there was a lot of activity [from Alpine], maybe that's the reason why the caribous were [elsewhere]. They were by the CD4 area, I mean the CD3 area. I wasn't really sure though. Those caribous have their own minds, they will do what they want. Most of them are scattered.* (SRB&A Nuiqsut Interview November 2010)

> *Seismic, they were doing seismic over here at winter. I was told there was caribou coming this way and then they took off somewhere. I didn't even bother to go check; [It was] during that seismic deal.* (SRB&A Nuiqsut Interview November 2010)

One individual reported that there were seismic lines on the ground near their family's Native Allotment at Itkillik River[6].

The majority of reported impacts associated with seismic activities occurred during the winter months (Figure 14). Two individuals provided the following suggestions for how the impacts of seismic activities could be mitigated:

> *There's no way it's going to be better. Just be sure they have their data so they never have to come back again. Get it all at once.* (SRB&A Nuiqsut Interview November 2010)

> *At least let us know they were going to do that. They didn't even let us know. I didn't even know.* (SRB&A Nuiqsut Interview November 2010)

Impacts of Oil Company Personnel

Four percent of respondents (two individuals) reported impacts related to oil company personnel in Year 3, similar to previous study years. Reported impacts included the presence of oil company personnel affecting caribou distribution and causing hunter avoidance. These individuals described their experiences as follows:

> *[At] Nigliq, I've seen those people out there. Any presence of people affect the caribous. Just even the presence of people scare the caribou away. Even just one person. I see them here. They were walking, and the chopper came and picked them up. The chopper was maybe 30 or 50 feet above the ground.* (SRB&A Nuiqsut Interview November 2010)

> *They always say we can hunt off their ice road. So when it's cold we try and go through and they won't let us through. They tell us we can hunt off of their road but the security won't let us through. That's from Nuiqsut to the Alpine road. I avoid the area [Alpine]. If I'm snowmachining I will go west.* (SRB&A Nuiqsut Interview November 2010)

EXISTING MITIGATION OF IMPACTS

During the Year 3 active harvester interviews, the study team presented each respondent with a list of mitigation actions that CPAI had implemented to lessen the impacts of the project on caribou hunting activities. Respondents were asked to identify: (1) whether they believed each mitigation action had been helpful and (2) whether the mitigation action needed improvement. The mitigation actions that were most identified as helpful were, in descending order, fuel voucher funding (78 percent of respondents), free natural gas (64 percent), subsistence representatives (44 percent), and local hire (24 percent) (Table 46).

[6] Because of their location near Itkillik River, these activities were likely unrelated to the Alpine or Alpine Satellite developments.

The mitigation actions that respondents most frequently indicated needed improvement were pipelines at least seven feet high (46 percent of respondents), local hire (36 percent), and fuel voucher funding (27 percent).

Table 46: Respondent Perceptions of Mitigation Actions, Nuiqsut, Year 3

	Helpful	Needs Improvement
Dull Coating	17%	19%
Pipelines at Least 7 Feet Height	15%	46%
Rounded Drilling Pads	5%	8%
Fencing Around CD	8%	15%
Fuel Voucher Funding	78%	27%
Subsistence Representation	44%	12%
Free Natural Gas	64%	10%
Local Hire	24%	36%

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Regarding fuel voucher funding, a large number of respondents indicated that they had benefited from the fuel voucher program. However, a number of respondents also indicated that the program, which is administered by the City of Nuiqsut, could use some improvement. In particular, these individuals reported misuse of the fuel voucher program by individuals who are not considered active caribou hunters:

> *Some of these people don't even go out and hunt. They are misusing the vouchers with some of these people. That needs to be improved a lot.* (SRB&A Nuiqsut Interview November 2010)

> *[Vouchers should be for] subsistence hunters only. I thought it was supposed to be for subsistence hunters but people just go in and fill up there trucks there.* (SRB&A Nuiqsut Interview November 2010)

> *No, I kept trying to go in but everybody would snag them up before I got there. There's people out there that don't need it that go get it and people that don't get it that really need it.* (SRB&A Nuiqsut Interview November 2010)

> *It's, I think it's pretty helpful. Sometimes people abuse it though, that's the only problem that I see. People are getting vouchers and instead of going out to hunt they are just putting it in their vehicles.* (SRB&A Nuiqsut Interview November 2010)

Other respondents thought that the existing fuel voucher funding was not adequate to assist all of the hunters in town:

> *And a lot of them go to hunters who go get them. It should only go to hunters. Like social impact over there. You only get 20 vouchers a month with 50 or 60 hunters. We're missing at least another 50 vouchers a month.* (SRB&A Nuiqsut Interview November 2010)

> *Only once. It's not really improving; they need more [fuel vouchers] instead of just a limited number that the city can give out per month. It's not enough for people that hunt and people that fish. And the voucher is not enough to harvest what you need to harvest.* (SRB&A Nuiqsut Interview November 2010)

A majority of Nuiqsut respondents reported benefiting from natural gas assistance funded by CPAI; however, some individuals were still waiting for natural gas hook-ups in their homes at the time of the Year 3 active harvester interviews[7]. Respondents noted that they pay a small fee for the service.

Regarding the dull coatings on pipelines at the Alpine development, several individuals indicated that the pipelines in the Alpine area are still too shiny or indicated that they had not observed the dull coatings on the pipelines. As one respondent described,

> *This hasn't been done. They still shine real bright. You still can see, it's still silver. When I saw the herd cross the pipeline, they were hesitating to cross it; they were bouncing off of it before they decided to go underneath. I think it reflects every which way you look at it.* (SRB&A Nuiqsut Interview November 2010)

Others believed the dull coatings had been effective, with one individual saying, "That's helpful [to coat the pipelines in dull paint] instead of being shiny. Once they see shiny things they turn around or go the other way" (SRB&A Nuiqsut Interview November 2010).

Another mitigation effort related to pipelines includes raising pipelines to a height of seven feet to allow passage of caribou and hunters[8]. Several individuals believed that the current height of the pipelines was adequate to allow caribou passage:

> *I didn't go through the pipelines the last three years. But I didn't see any problems with the caribous going across. I don't know about March or late winter when there gets higher snow.* (SRB&A Nuiqsut Interview November 2010)
>
> *Seven feet I would say would be good for most caribou.* (SRB&A Nuiqsut Interview November 2010)
>
> *Oh yeah, seven feet is real good for the caribou to go underneath.* (SRB&A Nuiqsut Interview November 2010)
>
> *It doesn't really bother me at all. I don't really have any complaints or issues about the pipeline. I think they did the good thing with the height.* (SRB&A Nuiqsut Interview November 2010)

Others either believed that the pipelines should be higher than seven feet or indicated that they had observed areas where the pipelines are much lower than seven feet. Several individuals observed that snow and snowdrifts lessen the height of the pipelines significantly during the winter. Nuiqsut harvester respondents provided the following comments regarding pipeline height:

> *There's some parts where they are pretty low actually like three, three and a half feet. I've seen like only three crossings and they are like two miles apart.* (SRB&A Nuiqsut Interview November 2010)
>
> *I wish they could bury that pipeline. Gosh you don't know how the pipeline height is measured. A bull caribou with a big rack, or is it measured during winter? No one knows how it is measured.* (SRB&A Nuiqsut Interview November 2010)
>
> *Usually you see them just walk underneath them. But in the low spot they'll just walk up and turn around. Some parts are high enough but most parts are kind of low. With the snow machines we have to go all the way around with the snow drifts and everything.* (SRB&A Nuiqsut Interview November 2010)

[7] The natural gas pipeline from Alpine to Nuiqsut is not administered by CPAI.

[8] CPAI has indicated that raising the pipeline higher than seven feet would pose safety risks to pipeline workers who are conducting maintenance (SRB&A, 2011).

Did you hear about the caribou that got stuck inside the pipeline? They called my brother cause a Caribou's horns got stuck in the pipeline, maybe even eight feet would be good cause seven feet is not that high, some of the caribou get really high. (SRB&A Nuiqsut Interview November 2010)

There are only certain places you can get across [the pipeline] when the snow gets pretty deep. (SRB&A Nuiqsut Interview November 2010)

Respondents were generally supportive of subsistence representative program, where Nuiqsut residents provide monitoring of ice roads and other CPAI activities to ensure no conflicts with subsistence activities and proper adherence to environmental standards. A number of harvester respondents had worked as subsistence representatives and described the experience as positive.

It's been good, we provide those services, having sub reps [subsistence representatives] and monitors out there. We are keeping them on track and making sure that they are complying with what the permit stipulations say. (SRB&A Nuiqsut Interview November 2010)

Yeah, it's working well. They are making sure that things get done. Now it's just pretty much monitoring. It works though; it's there for a purpose. It keeps some people on track; they get pretty lazy. Some, very few not all people, come up here and don't have respect for it. (SRB&A Nuiqsut Interview November 2010)

I'm a subsistence rep for [oil services company], and I monitored caribou and wildlife and the spills they had out there and tundra damage and scrapes. They [monitors] are a big help. They really keep the communication with the oil field and the locals….When I first started there was more reps; now we're down to half. Even though I was the only sub rep for the day, we did pretty good. It would be nice to have a second sub rep, but there wouldn't be any use for it. In the previous year we had two during the day and two at night, but we didn't need it. (SRB&A Nuiqsut Interview November 2010)

A few individuals provided suggestions for how the subsistence representative program could be improved, including extending the season of employment and providing better methods of communication between subsistence representatives and the community:

They can do more. They can put them out there when the project starts and keep them out there till the end of the season. There can clean up when it kind of gets shut down. They can get on their snow machines and clean up more on the road. They have a good, end of April and May when we have spring weather, and they can get out there and pick some things up. The sub reps really help out because you get somebody from Anchorage never been up here before, and they have no idea what things are. It's good to have somebody there reminding them all the time. (SRB&A Nuiqsut Interview November 2010)

It seems to be when they get people from here to do it. Communication between the community could be better. I suggested to one of the companies [that] it would be a good idea for the sub rep to carry a radio [in order to communicate with nearby hunters]. But they said we couldn't because of aerial laws. (SRB&A Nuiqsut Interview November 2010)

Related to the subsistence representative program is the issue of local hire. Nearly a quarter (24 percent) of Year 3 Nuiqsut respondents indicated that they had benefited from local hire through CPAI. However, a higher percentage (36 percent) indicated that local hire in the community could be improved. In general, respondents had differing opinions on the status CPAI's local hire in the community:

I don't see any slope hire anymore. I mean the local hires now are just like labor for machines. There's nobody in anything else [other type of position]. (SRB&A Nuiqsut Interview November 2010)

They're doing their best as they can do. [Residents] have to be willing to go to work [in order] to go to work. (SRB&A Nuiqsut Interview November 2010)

They say there's always jobs for people, but I don't see any that are working other than I know of one person from here. Even though local hires have always been addressed, it is a matter of the individual, whether or not they want to work there or not. They [residents] say they will be discriminated against. I used to be told this is a white man's job; these young people are losing good jobs. (SRB&A Nuiqsut Interview November 2010)

I think it needs to be a little bit more improved, but not a lot. I understand that there's a lot of racism to us and that's why people sometimes people quit. Especially people from [other states] and the south. There are a few of them [but] some people are so welcoming to us to be there. (SRB&A Nuiqsut Interview November 2010)

I haven't worked there in a number of years. I did that for a while, the pay's good. But I have a more permanent job now that's more closer to home; it's in town. (SRB&A Nuiqsut Interview November 2010)

I have applied several times, but nothing. They make it look like there's jobs available for us, but it's extremely rare. [They are] very, very strict with regards to their employees. And that's where the cultural conflict is right there, with those interactions. It bothers me. (SRB&A Nuiqsut Interview November 2010)

It's out there for people to grab. They have all that in place, people just need to get out there and have at it. They don't make the effort, but it's there for the grabs. (SRB&A Nuiqsut Interview November 2010)

I say it seems about average. There can always be improvement [with local hire]. I think it's just going to be an ongoing issue to work out. (SRB&A Nuiqsut Interview November 2010)

I don't know, I'm sure there's always need for more jobs here, and more so during the off road season time. Like when the ice road is not operational. It would be nice for a lot of people, for other people that need work. A lot of people I know are looking for work a long time. (SRB&A Nuiqsut Interview November 2010)

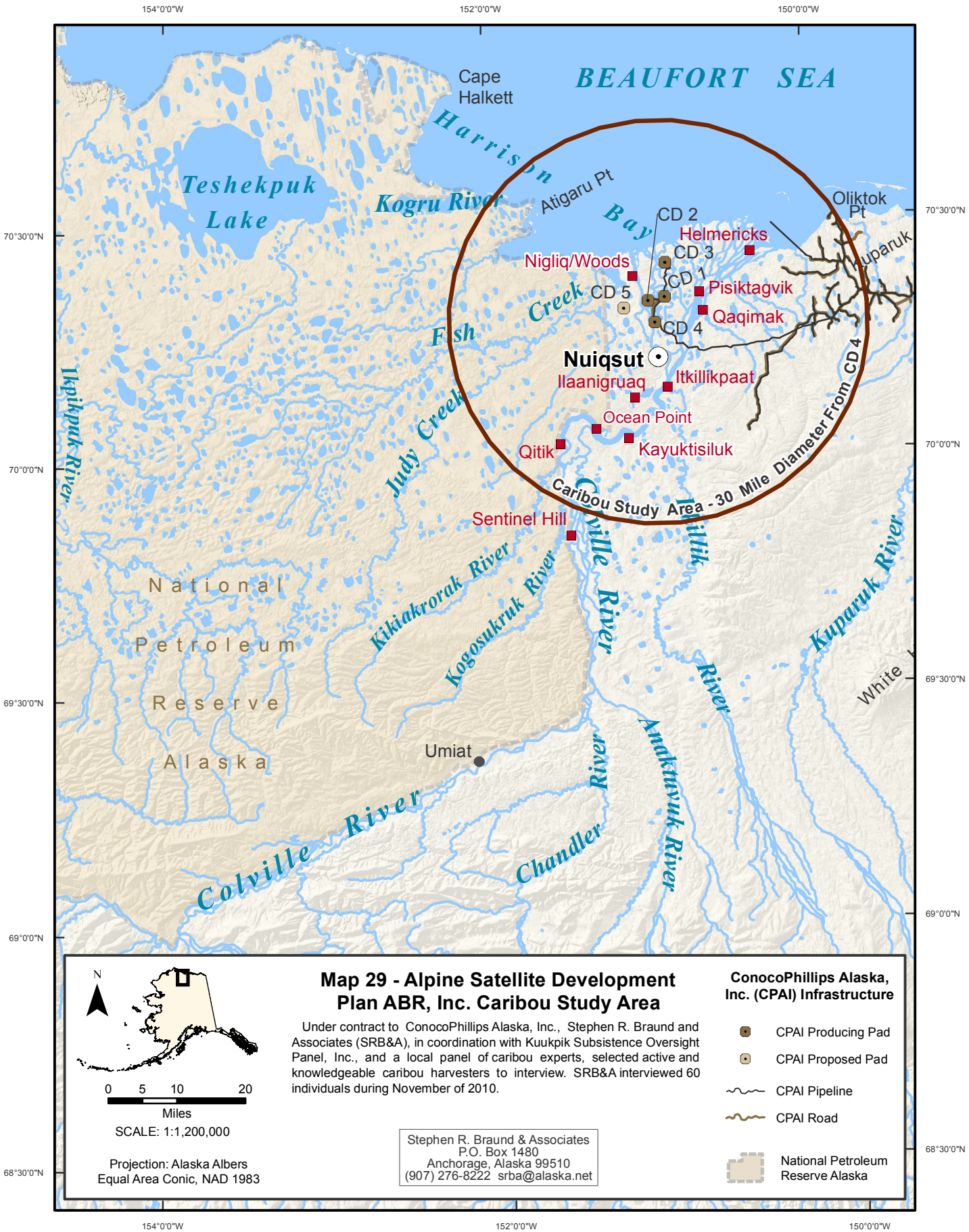
We're improving, under the MOA we have with Kuukpik and Conoco. We are pursuing and there's some progress being made. So far, we have one resident that's an [oil services] employee and 13 that are working their way up. People need to step up, that's the only problem. We provide training to meet the requirements, but it's up to people to make that commitment. (SRB&A Nuiqsut Interview November 2010)

During the Year 3 draft review meeting with the caribou panel, one panel member discussed the possibility of CPAI reducing air traffic during the peak of the hunting season. He observed,

I think that they should try and minimize the air traffic during those months [July and August] and see if that changes where the caribou go, and if that changes the ways that the migrations occur. And then we can see if we get a change with the pattern over here [and] check to see if the impacts are less during those months. That would be good to point out to ConocoPhillips, not just them but the other agencies and the Borough and the State of Alaska. (SRB&A Nuiqsut Caribou Panel Meeting May 2012)

TESHEKPUK AND CENTRAL ARCTIC HERD TRENDS

This section summarizes current Teshekpuk Herd (TH) and Central Arctic Herd (CAH) trends, based primarily on information provided by ABR, Inc. and available in the 2010 report on the Alpine Satellite Development Plan (ASDP) caribou monitoring study (Lawhead, Prichard, and Macander 2011). Data on 2010 Nuiqsut caribou hunting activities are incorporated and discussed where relevant. The ASDP caribou monitoring study area (Map 29), which is centered on the Colville River delta (within a 30-mile



Map 29 - Alpine Satellite Development Plan ABR, Inc. Caribou Study Area

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 60 individuals during November of 2010.

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ConocoPhillips Alaska, Inc. (CPAI) Infrastructure

- CPAI Producing Pad
- CPAI Proposed Pad
- CPAI Pipeline
- CPAI Road
- National Petroleum Reserve Alaska

radius around the CD-4 pad), is used at various times of the year by two neighboring herds of caribou (Rangifer tarandus)—the TH and the CAH. Based on extensive radio-tracking by the ADF&G, NSB, Bureau of Land Management, and CPAI since the late 1970s and early 1980s, the TH generally ranges to the west and the CAH to the east of the Colville River delta, but caribou from both herds use the delta occasionally, primarily in summer (Lawhead et al. 2010). In addition to radio-telemetry using VHF, satellite, and GPS collars, these herds have been the focus of many aerial transect surveys in the last 25 years. The other two herds that inhabit Alaska north of the Brooks Range—the Western Arctic Herd (WAH) and Porcupine Herd (PH)—have not been recorded in the ASDP study area. The WAH normally ranges well to the southwest, migrating to and from western Alaska south of the Brooks Range, and the PH spends the year far to the east, migrating to and from the Yukon in Canada. Residents of Nuiqsut, located on the Nigliq Channel of the Colville River delta, therefore rely primarily on caribou from the CAH and TH. According to Pedersen (2008), a greater proportion of Nuiqsut caribou harvests comes from the TH (approximately 60 percent) versus the CAH (approximately 30 percent).

The TH generally remains on the coastal plain year-round. The area of most concentrated calving is located consistently around Teshekpuk Lake and the primary area used for relief from insect harassment in midsummer is the swath of land between Teshekpuk Lake and the Beaufort Sea coast (Prichard and Murphy 2004, Carroll et al. 2005, Person et al. 2007). Most TH caribou winter on the coastal plain, although the specific areas used vary widely from year to year and some TH caribou occasionally (most notably in 1990–1991 and 2008–2009) overwinter south of the Brooks Range with the Western Arctic Herd (WAH) (Philo et al. 1993, Prichard and Murphy 2004, Carroll et al. 2005, Carroll 2007, Person et al. 2007, Parrett 2009). In recent years, a substantial portion of the TH also has wintered in areas outside the previous range of the herd, from far east in the Arctic National Wildlife Refuge (ANWR) in 2003–2004 (Carroll et al. 2004, Carroll 2007) to southeast in the winter range of the CAH since 2004–2005 (Carroll 2007; Lawhead et al. 2007, 2008; Lenart 2009; Parrett 2009).

Caribou movements often are unpredictable, except for broad seasonal patterns, and it is not uncommon for herds that are increasing in size to shift their range use into marginal areas as they grow larger (Hemming 1971). The TH increased substantially in size since the late 1970s and early 1980s, when it was estimated at 3,000–4,000 animals (Carroll 2007). Subsequent censuses produced estimates of 11,822 caribou in 1984; 13,406 in 1985; 16,649 in 1989; and 27,686 in 1993 (Carroll 2007). The TH experienced a dip in numbers in the early/mid-1990s similar to that seen in the neighboring CAH, but increased steadily from 25,076 animals since 1995, reaching at least 28,627 animals in 1999, 45,166 animals in July 2002, and 64,106 caribou on the most recent photocensus in July 2008 (Parrett 2009), the greatest size yet recorded for the TH.

The CAH is the primary herd using the oilfield region on the central arctic coastal plain. From the early 1970s to 2002, the CAH grew at an overall rate of 7 percent per year. The herd grew rapidly from about 5,000 animals in the mid-1970s to the early 1990s, reaching a count of 23,444 caribou in July 1992 before declining 23 percent to 18,093 caribou in July 1995 (Lenart 2009). The herd has increased since then, reaching 19,730 animals in July 1997, 27,128 animals in July 2000, and 31,857 animals in July 2002 (Lenart 2009). A photocensus conducted in July 2008 by ADFG produced an estimate of 66,772 caribou, the greatest size yet recorded for this herd (Lenart 2009) and representing a 13 percent average annual rate increase since 2002. A photocensus conducted by ADFG in July 2011 yielded an estimate of approximately 55,000 animals in the herd, representing a 14 percent decline from the previous (2008) estimate (Lawhead and Prichard, 2012). Another photocensus had been conducted in 2010, but the results were considered unsatisfactory. Both the 2010 and 2011 censuses for the CAH and the TH experienced difficulties due to mixing of the two herds (Lawhead and Prichard, 2012).

Concentrated calving activity by the CAH tends to occur in two areas of the coastal plain, one located south and southwest of the Kuparuk oilfield and the other east of the Sagavanirktok River (Wolfe 2000,

Arthur and Del Vecchio 2009, Lawhead and Prichard 2010). The CAH typically moves to the Beaufort Sea coast during periods of mosquito harassment (White et al. 1975, Dau 1986, Lawhead 1988). In recent years the majority of the CAH has wintered south of the Brooks Range, generally east of the Trans-Alaska Pipeline (Arthur and Del Vecchio 2009, Lenart 2009) and summer movements since about 2003 have extended much farther east than in the previous two decades, with some CAH animals traveling far east on the coastal plain of ANWR (Lenart 2009, Lawhead et al. 2010). Use of the Colville River delta by caribou is highest during the summer insect season (late June to early August), which is also when residents of Nuiqsut most frequently harvest caribou in that area (Maps 18 through 20).

The caribou monitoring study implemented by ABR, Inc. provides data on the number and density of caribou in four different survey areas: National Petroleum Reserve – Alaska (NPRA) (west of the Colville River delta beyond Fish Creek), Colville River Delta, Colville East (east of the delta), and Itkillik River toward the Kuparuk oilfields. Surveys occurred on up to five different survey dates. According to Lawhead et al. (2011), the density of caribou in the Colville River Delta in 2010 was relatively low compared to the NPRA and Colville East survey areas. Survey data from ABR, Inc. starting in early June shows a heavy concentration of caribou east and southeast of the Colville River delta in early June (June 7-9), with increasing numbers west of the Colville River delta in late June (June 21-22). Sporadic groups were observed throughout the ASDP study area in early August, including one large group of between 100 and 200 caribou observed on the east channel of the Colville River delta. Late August and early September surveys show increasing occurrence of caribou both west of Nuiqsut and east of the Colville River delta (Lawhead et al. 2011: Figure 5). The greatest observed density of caribou in the Colville River delta was a group of over 400 caribou in early August; however, two large groups of caribou (over 1,000 animals) were observed on time-lapse cameras north of the Alpine development. The observed density of caribou in the NPRA area was highest in late June (an estimated 426 caribou) and mid-September (an estimated 1,066 caribou) (Lawhead et al. 2011: Table 2). Harvests of caribou by Nuiqsut residents in September 2010, while lower overall than in July and August, were concentrated west of the community in the NPRA study area, coinciding with the increased density of caribou (Map 22).

Lawhead et al. (2011) notes that the yearly distribution of caribou from the TH and CAH herds is dependent on a variety of factors, including herd range, snow cover, vegetative conditions, and habitat type. For example, areas with recent snowmelt are favorable to caribou due to new, high quality, vegetative growth. In addition, the density of caribou along creeks and in coastal areas is higher during the peak mosquito season. Annual weather conditions, therefore, have a substantial effect on the distribution of caribou and their resulting availability to local hunters. Because the Colville River delta is "at the interface of the annual ranges of the TH and CAH," (Lawhead et al., 2011) and in most years does not see large movements or aggregations of caribou from either herd, any factor that influences their distribution and/or behavior, including weather patterns, food availability, and/or development-related disturbances, could have substantial impacts, either positive or negative, on the availability of caribou to Nuiqsut harvesters.

SUMMARY

Three years of monitoring of impacts of CD4 and other CPAI satellite developments on Nuiqsut residents' caribou hunting activities have been completed. The monitoring data are based on interviews with a sample of active Nuiqsut caribou harvesters as well as household harvest surveys. Their reports, along with data assembled by other parties, are intended to help achieve a common understanding of these impacts.

Sixty respondents were interviewed in Year 3 (including 57 active harvesters), compared with 54 in Year 2 (including 53 active harvesters) and 40 in Year 1 (including 37 active harvesters). Elder interviews occurred during each of the three study years. Fifty-seven active harvester respondents reported 215 caribou use areas for the Year 3 time period (November 2009 to October 2010). They also identified 196

successful harvest locations, compared to 181 in Year 1 (reported by 36 harvesters) and 152 in Year 2 (reported by 45 harvesters). In Year 3 the research team also conducted a comprehensive household harvest study yielding an estimate of 471 caribou harvested by all Nuiqsut harvesters in a twelve month period from January to December 2010. The average pounds harvested per household in the 2010 survey (707 pounds) is higher but somewhat comparable to harvest estimates made for the 2006-07, 2004-05, and 2003-04 study periods; it is higher than harvest estimates made in 2000-01, 2002-03, and 2005-06, and higher than earlier estimates made in 1994-95 and 1995-96. Harvests over the last decade are lower than estimates made in 1993 (903 mean pounds per household) and 1985 (790 mean pounds per household).

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. Year 3 results show an increase over Years 1 and 2 in the percentage of harvester respondents reporting a change in hunting area. Year 3 results also show a decrease in the percentage of respondents indicating that they did not harvest enough caribou to meet their needs, with fewer respondents harvesting less caribou, and a slightly higher percentage of respondents harvesting more caribou in comparison with the previous year.

The percent of harvesters observing caribou with abnormalities declined over the three study years from 64 percent in Year 1 to 38 and 40 percent in Years 2 and 3, respectively. The two principle types of abnormalities observed are “health” and “size.” The number of abnormal caribou reported in Year 3 (37) is above the number reported in Year 2 (34), and substantially below that reported in Year 1 (70). Disease/Infection was the most common abnormality observation during all three study years, followed by a decrease in resource size and an increase in resource size.

Sixty-one percent of harvesters in Year 3 reported one or more development impacts on caribou hunting. This compares with 83 percent of harvesters in Year 1 and 70 percent of harvesters in Year 2. As in the case of Year 1 and Year 2, the most commonly reported impact was associated with helicopter traffic, with 51 percent of harvesters reporting helicopter traffic impacts in Year 3. These observations accounted for almost half (48 percent) of all impact observations in Year 3. There has been a marked decrease in reports of impacts of man-made structures, from 67 percent in Year 1, to 34 percent in Year 2, and nine percent in Year 3. Plane traffic impacts were reported by less than half as many harvesters in Year 3 as in Year 1 (21 percent versus 53 percent). The percentage of harvesters reporting impacts from seismic lines or activity increased from no mentions in Year 1 (when this potential impact was not cued by researchers) to 13 percent of harvesters in Year 2 and 18 percent of harvesters in Year 3. The substantial differences in impact observations between Year 1 and subsequent study years may be due in part to a focus in Years 2 and 3 on gathering data on direct impacts experienced by hunters during the study period rather than gathering data on impacts related to more long-term changes (e.g., general migratory changes related to the construction of the pipeline, which were documented during Year 1). In Year 3, respondents noting impacts related to helicopter traffic observed that these impacts lessened following a meeting between CPAI and the community, indicating that mitigation measures implemented as a result of this meeting may have been at least somewhat effective in addressing the issue of helicopter traffic.

Specific mitigation measures implemented by CPAI to address potential impacts to Nuiqsut residents and subsistence activities include dull coatings on Alpine pipelines, pipeline heights of at least seven feet, fuel voucher funding for Nuiqsut harvesters, free natural gas, a subsistence representative program, and local hire. A majority of active harvester respondents reported that the fuel voucher funding (78 percent) and free natural gas programs (64 percent) had been helpful to them. In addition, respondents believed that certain mitigation measures, including pipeline height (46 percent of respondents), local hire (36 percent), and fuel voucher funding (27 percent), could be improved.

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APPENDIX A: NUIQSUT CARIBOU MONITORING PROTOCOL, ACTIVE HARVESTER INTERVIEW YEAR 3

NUIQSUT CARIBOU MONITORING PROTOCOL, 2010

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

SECTION A: CARIBOU HUNTING ACTIVITIES, NOVEMBER 2009 – OCTOBER 2010

1. Did you go caribou hunting between November 2009 and October 2010? YES ___NO___ (IF NO, INTERVIEW OVER)
2. Where did you hunt for caribou between November 2009 and October 2010? (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 2009, was your hunting area different in 2010? YES _____ NO _____

3a. [IF YES], HOW? _____

_____

3b. [IF YES], WHY? _____

_____

4. Compared to 2009, was the # of hunting trips in 2010 the same, less, or more? LESS _____ SAME ____ MORE ____

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

_____

5. Compared to 2009, was the duration of trips in 2010 the same, less, or more? LESS _____ SAME ____ MORE ____

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

_____

6. Compared to 2009, were the months you hunted for and harvested caribou in 2010 different? YES _____ NO ____

6a. [IF YES], HOW? _____

_____

6B. [IF YES], WHY? _____

_____

7. Compared to 2008, was the # of caribou you harvested in 2009 the same, less, or more? LESS _____SAME __ MORE ___

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

_____

8. Did your household harvest enough caribou in 2009 to meet your needs? YES_____ NO _____

8a. [IF NO], WHY? _____

_____

SECTION B: ASSESSMENT OF HARVESTED CARIBOU, 2010

1. Thinking about the caribou you shot or harvested in 2010, did you notice any of the following?

(If none, Skip to Section C)

_____ 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

2. For each type of abnormality, 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 Points]: _____

Approximately how many of the caribou were abnormal? _____

Did you use these caribou? YES _____ NO _____

SECTION C: IMPACTS ON CARIBOU HUNTING, 2010

1. In 2010, 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 2010, 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]**	**How could this impact be lessened in the future?**
Helicopter traffic*					
Plane traffic*					
Other traffic					
Oil company personnel					
Structures (e.g., pipelines) blocking hunter access					
Regulations					
Seismic lines or activity					
Other					

4. Were any of the following CPAI mitigation programs helpful to you in 2010? Do any of them need improvement?

Helpful	Needs Improvement		Describe:
☐	☐	Dull Coatings on Pipelines	_____
☐	☐	Pipelines at least 7 ft	_____
☐	☐	Rounded drilling pads	_____
☐	☐	Fencing around CD4	_____
☐	☐	Fuel vouchers	_____
☐	☐	Subsistence reps	_____
☐	☐	Free gas	_____
☐	☐	Local hire	_____

SECTION D: ADDITIONAL OBSERVATIONS ABOUT CARIBOU, 2010

1. Was there anything else abnormal about the behavior, distribution, or migration of caribou in 2010? YES _____ NO ____

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

APPENDIX B: NUIQSUT HOUSEHOLD CARIBOU HARVEST SURVEY FOR 2010

NUIQSUT HOUSEHOLD CARIBOU HARVEST SURVEY FOR 2010

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. Nuiqsut Trapper School students are assisting SRB&A with this effort. Your individual information will remain anonymous.

HH ID: _____ Person Responding to Survey (check one): _____ Head of HH _____ Other Adult HH member

Interviewer: _____ Date: _____

Between January and December 2010…

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 2010? _____

5. During which months did you harvest these caribou? (Try to record the number of harvests by month):_____

	# Harvested		# Harvested
January	_____	July	_____
February	_____	August	_____
March	_____	September	_____
April	_____	October	_____
May	_____	November	_____
June	_____	December	_____
		Unknown	_____

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

7. Did you or anyone in your household receive caribou from other households? YES _____ NO

8. Did any Alpine-related activities in 2010 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 C: NUIQSUT CARIBOU MONITORING INFORMED CONSENT, YEAR 3

Stephen R. Braund & Associates

P.O. Box 1480, Anchorage, Alaska 99510
907-276-8222 (Phone); 907-276-6117 (Fax)
srba@alaska.net

Nuiqsut Caribou Subsistence Monitoring Project
November 2010
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 third year of the study.

While in your community, we would like to interview knowledgeable subsistence harvesters about their caribou subsistence use during 2010. 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 in 2010.

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 D: 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 repsonse 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.