Nuiqsut Caribou Subsistence Monitoring Project: Results of Year Two Hunter Interviews

Prepared for

ConocoPhillips Alaska, Inc.

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EXECUTIVE SUMMARY

This Year 2 report presents the first two 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) historical subsistence use. This second annual report is based primarily on hunter observations. An important function of the report is to identify additional data monitoring components most relevant to developing a common understanding of these impacts.

In April and May 2010, SRB&A conducted interviews with 54 Nuiqsut caribou hunters regarding their caribou hunting activities in 2009. These data complemented data collected in March and April 2009 regarding residents' hunting activities in 2008, which were presented in a Year One report (SRB&A, 2009). During the 2010 interviews, hunters provided 2009 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 186 caribou use areas and 151 caribou harvest locations for the 2009 study year, the majority of which were located along the Colville River and west of the community toward Fish Creek. Respondents reported changes in their 2009 harvest activities such as harvest amounts and trip frequency, duration, and timing, often attributing these changes to changes in caribou migration or resource availability, and disturbance from helicopter or airplane traffic. The number of caribou harvested by interviewed harvesters (not a statistical sample) decreased from 397 in 2008 to 277 in 2009, a decrease of 30 percent despite a higher number of hunter respondents providing harvest data for the 2009 study year.

Nuiqsut respondents reported various impacts on harvest activities that they attributed to oil and gas development. These included impacts of helicopter, airplane, and other traffic, man-made structures, and regulations. The most commonly reported impacts were related to helicopters, airplanes, and man-made structures (e.g., pipelines). Ongoing data collection in 2011 (for 2010) and additional years will assist in gaining a greater understanding of the nature of these impacts and changes over time.

ACKNOWLEDGMENTS

Stephen R. Braund & Associates (SRB&A) would like to thank the community of Nuiqsut for their cooperation and assistance in completing the first two 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 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 and participating in 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 54 Nuiqsut caribou hunters and elders who provided us with the information for year two of this study.

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ACRONYMS AND ABBREVIATIONS

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

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. The intent of the project is to assemble data on 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 second annual report is based primarily on hunter observations. An additional section provides update of 2009 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.

To monitor impacts on caribou hunting in Year 2 of the monitoring program, SRB&A, with the assistance of a Nuiqsut panel of caribou experts, modified the Year 1 interview protocol to reduce response burden and increase the specificity of recorded observations so that researchers collected data relevant only to 2009. The Year 1 protocol included questions that provided residents the opportunity to describe impacts and changes they had observed prior to the 2008 and since the beginning of the Alpine Satellite development. This report contains the results of the first two years of hunter information derived from face-to-face interviews conducted in Nuiqsut between March 10, 2009 and April 8, 2009 for Year 1 and April 19, 2010 and May 28, 2010 for Year 2. The reporting periods for this information are 2008 (Year 1) and 2009 (Year 2).

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. The Nuiqsut Caribou Monitoring Project is designed to monitor and understand the causes of the following potential problems that have been reported by North Slope hunters including those from another study entitled *Impacts and Benefits of Oil and Gas Development to Barrow, Nuiqsut, Wainwright, and Atqasuk Harvesters* (SRB&A 2009):

1. Fewer caribou nearby Nuiqsut
2. Fewer caribou within a day's snow machine ride of Nuiqsut
3. Fewer caribou within reach of community hunters
4. More than the usual number of skinny caribou
5. More than the usual number of caribou with signs of parasites or disease
6. More caribou behaving as if they are disturbed
7. Physical obstacles making it harder to reach hunting areas
8. Regulations closing hunting areas
9. Disturbance of hunters by security or other industry personnel

STUDY AREA

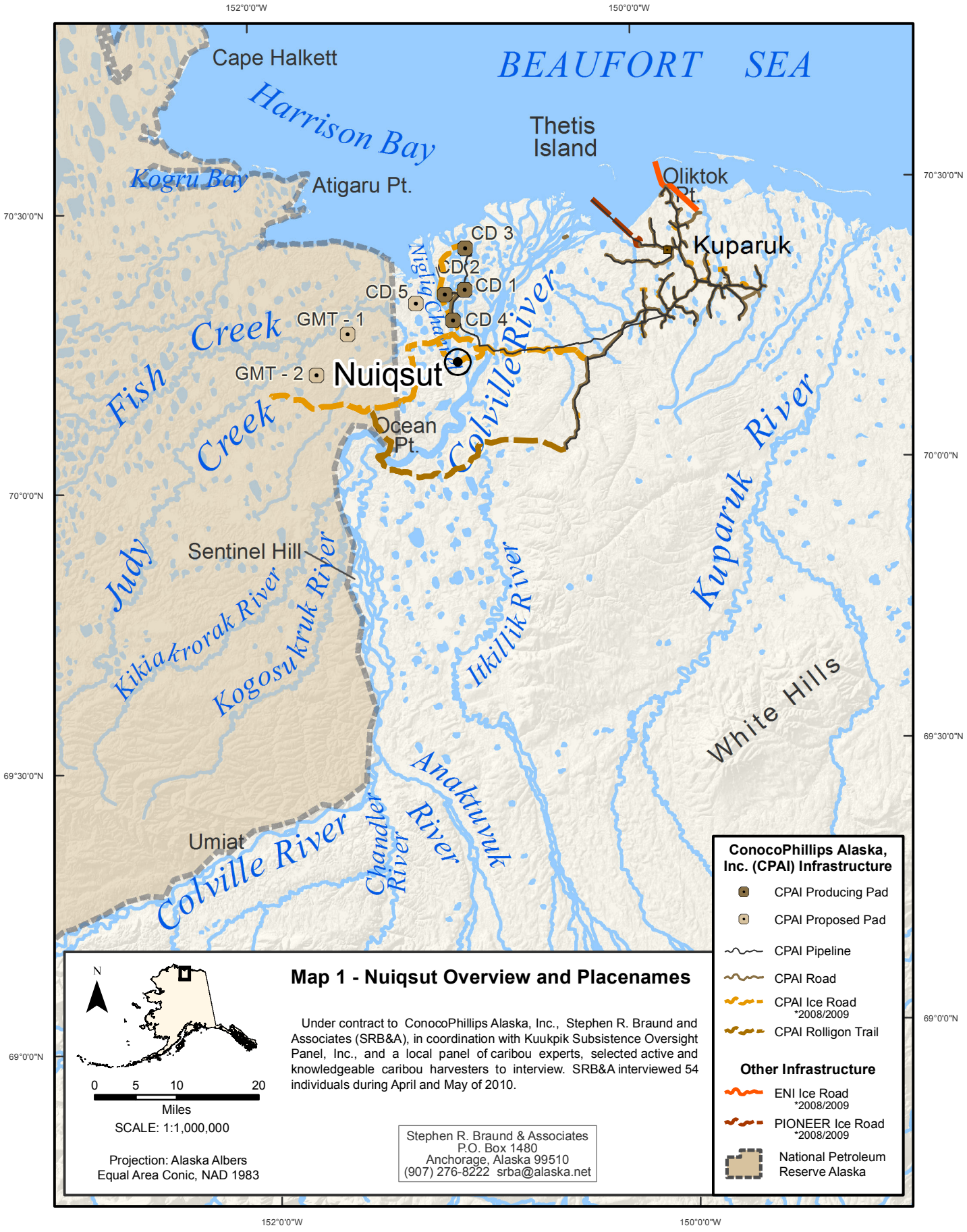
The NSB permit to CPAI for development of CD4 stipulates that the subsistence study should consider impacts of the CD4 development as well as other CPAI satellite developments located within a 30-mile radius of CD4. Impacts related to these developments may occur outside the immediate vicinity of the individual developments. Therefore, for the purposes of this project, the study area includes all areas used for caribou hunting by the community of Nuiqsut. Maps 1 and 2 show placenames 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 2 to design and implement the study. While Year 2 monitoring activities gathered information for 2009, interviews and meetings took place in 2010. Thus, the methods describe 2010 monitoring program activities while the results and discussion describe 2009 caribou hunting activities and impacts.

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 2 monitoring program was through contact with the Kuukpik Subsistence Oversight Panel, Inc. (KSOPI) and the previously formed Nuiqsut panel of caribou experts. SRB&A had sent copies of the Year One draft report (in September 2009) and final report (in late February 2010) to KSOPI to distribute to each of the Nuiqsut caribou panel members. Because review of the Year One report by CPAI took longer than expected,


152°0'0"W
150°0'0"W
70°30'0"N
70°0'0"N
69°30'0"N
69°0'0"N
BEAUFORT SEA
Cape Halkett
Harrison Bay
Kogru Bay
Atigaru Pt.
Thetis Island
Oliktok Pt.
Kuparuk
CD 3
CD 2
CD 1
CD 5
CD 4
Nigliq Channel
GMT - 1
GMT - 2
Nuiqsut
Fish Creek
Ocean Pt.
Colville River
Kuparuk River
Judy Creek
Sentinel Hill
Kikiakrorak River
Kogosukruk River
Itkillik River
White Hills
Umiat
Colville River
Chandler River
Anaktuvuk River
N
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Miles
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Equal Area Conic, NAD 1983
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 54 individuals during April and May of 2010.
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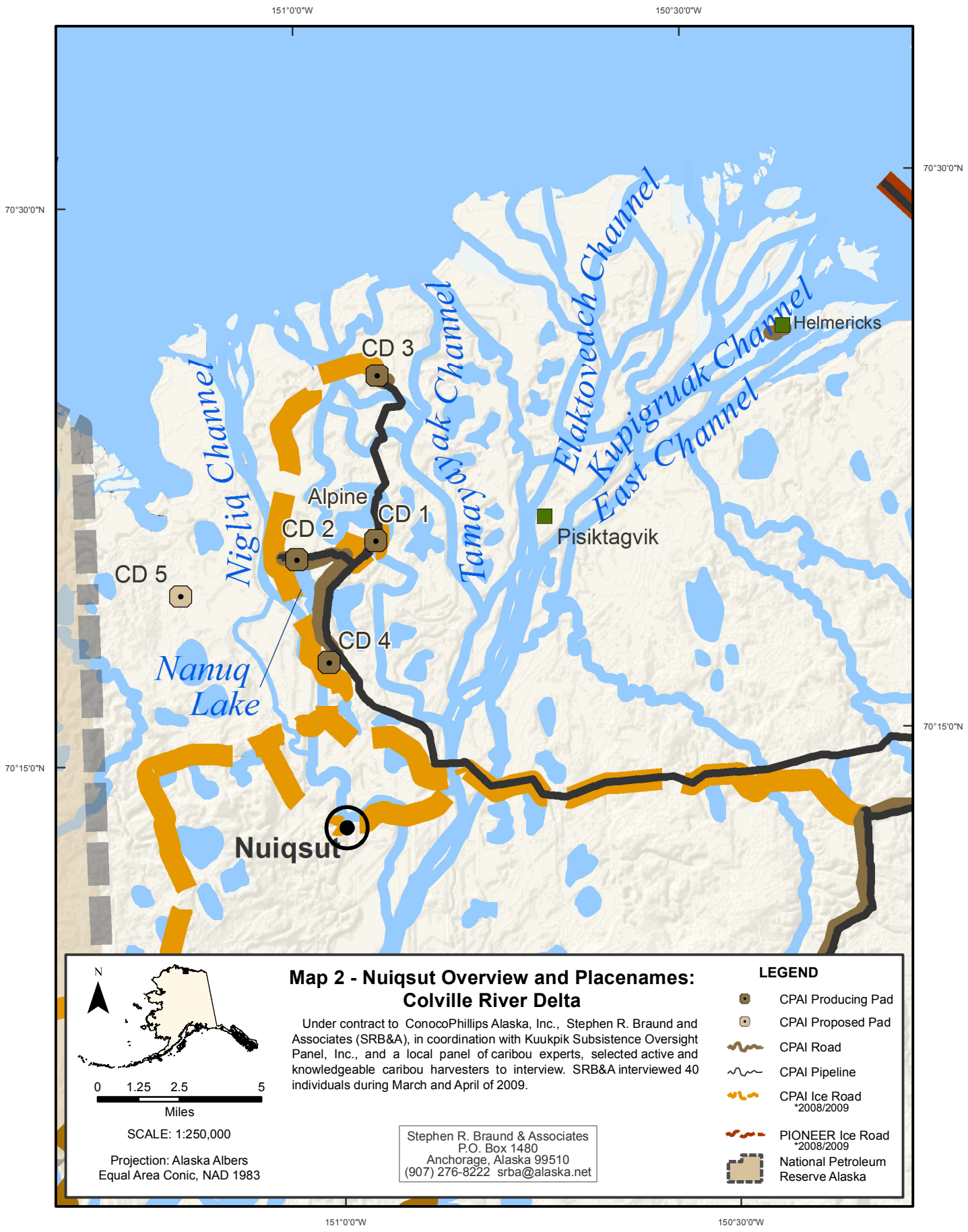
ConocoPhillips Alaska, Inc. (CPAI) Infrastructure
CPAI Producing Pad
CPAI Proposed Pad
CPAI Pipeline
CPAI Road
CPAI Ice Road *2008/2009
CPAI Rolligon Trail
Other Infrastructure
ENI Ice Road *2008/2009
PIONEER Ice Road *2008/2009
National Petroleum Reserve Alaska


151°0'0"W
150°30'0"W
70°30'0"N
70°15'0"N
Niglig Channel
Tamayyak Channel
Elaktoveach Channel
Kupigruak Channel
East Channel
Helmericks
CD 3
Alpine
CD 1
CD 2
CD 5
CD 4
Pisiktagvik
Nanuq Lake
Nuiqsut
N
0 1.25 2.5 5
Miles
SCALE: 1:250,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
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 40 individuals during March and April of 2009.
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LEGEND
CPAI Producing Pad
CPAI Proposed Pad
CPAI Road
CPAI Pipeline
CPAI Ice Road
*2008/2009
PIONEER Ice Road
*2008/2009
National Petroleum
Reserve Alaska

SRB&A waited to schedule a community review meeting or panel meeting until the report was final. On March 30, 2010 a Nuiqsut panel member contacted SRB&A to express frustration that the study team had not met with the panel before finalizing the report and that it had been almost a year since SRB&A had been to the community. SRB&A scheduled a trip to Nuiqsut for April 14 and 15 to meet with KSOPI (on the 14th) and the Nuiqsut panel of caribou experts (on the 15th). However, the flight to Nuiqsut was canceled. SRB&A attempted to meet with KSOPI via teleconference on April 14, 2010 but the KSOPI meeting had been rescheduled. SRB&A also attempted to schedule a meeting with panel members on April 19, but the majority of panel members were unavailable. SRB&A was unable to schedule a Year 2 meeting with the Nuiqsut caribou panel until May 24, 2010. A second panel meeting took place on September 20, 2010, and a meeting with KSOPI occurred the following day on October 1, 2010. The following is a summary of Year 2 Meetings with the Nuiqsut caribou panel.

Nuiqsut Caribou Panel Meetings

The study team met with the Nuiqsut caribou panel on May 25, 2010 to review the previous year and plan Year 2 field work. Researchers had tried to meet with the panel and kick off field work during the week of April 19, but few panel members were in town or available to participate in a meeting. During the week of May 24, 2010, SRB&A conducted Year 2 active harvester interviews with a small number of caribou hunters; however, many people were out of town, and the study team decided to return in late May to meet with the panel again and complete the active harvester interviews.

Five panel members attended the May 25, 2010 meeting. During the meeting, panel members provided the following comments and suggestions regarding monitoring activities:

- SRB&A needs to improve communication with the panel and should contact and send materials (e.g., draft reports) to panel members directly rather than relying on KSOPI for all communications. Panel members provided SRB&A with their mailing addresses.
- SRB&A should meet with the panel each year to review the draft report before finalizing the report.
- SRB&A should meet with the panel no less than two times per year.
- CPAI originally told Nuiqsut residents that they could hunt anywhere in the vicinity of project facilities, but now there is a buffer zone and CPAI uses homeland security as a reason to regulate local hunting activity.

> CPAI reviewers believe this information is incorrect. CPAI hosted a community meeting in December 2010 (after the Year 2 interviews were conducted) to discuss this issue and address misunderstandings. Per the Kuukpik surface use agreement, access is not restricted to Nuiqsut residents and Kuukpik shareholders, except for lands located within 1,000 feet of oil and gas facilities other than roads. Residents still have access within this 1,000 feet, though no explosive materials are allowed. The other rules with this 1,000 feet zone are that vehicles such as snowmachines shall yield to other vehicles, no littering, and prompt notification to CPAI of any spills.

- The study should include data about the cumulative effects of oil and gas development on caribou, not just focusing on Alpine satellites[1].
- Nuiqsut has had little opportunity to provide input on the activities occurring west of the community at CD5, the proposed GMT-1 (locally referred to under its previous name, CD6), and the proposed GMT-2 (locally referred to under its previous name, CD7).
- Residents continued to experience the impacts of pipelines, plane traffic, and helicopter traffic in 2009 (Year 2).
- It would be best for the study team to return during the last part of September, right after the bowhead whaling season and after the peak of the caribou hunting season, to ask hunters about their caribou hunting activities for the previous year.
- One panel member agreed to be a primary point of contact for the Nuiqsut caribou panel.

SRB&A agreed to return to the community in September to meet with the Nuiqsut caribou panel and discuss initiation of Year 3 fieldwork. The study team also agreed that future contact with the panel would be more direct.

As agreed, SRB&A returned 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. The meeting took place at the KSOPI office 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.
- Although SRB&A had planned on returning in January 2011 to conduct Year 3 interviews, 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.

SRB&A agreed to discuss the feasibility of returning to Nuiqsut in November 2010 to conduct Year 3 active harvester interviews. Upon returning from Nuiqsut, the study team prepared a panel meeting

[1] SRB&A made clear in the meeting that this was not in the scope of the study and that the community needed to address cumulative effects elsewhere.

summary and mailed a copy of the summary to each panel member (Appendix A). The study team also contacted the three new panel members and invited them to join panel. All three agreed to participate on the panel.

KSOPI Meeting

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.

Study Design and Field Preparation

At the outset, the field effort for the Nuiqsut caribou monitoring program was comprised of annual interviews with active caribou harvesters in Nuiqsut. Annual household caribou harvest surveys and an elder's caribou workshop to gather data about long-term observations and changes in caribou were added to the monitoring design in response to suggestions from the Nuiqsut caribou panel during Year 1. These tasks were not completed in Year 2 (see discussion below).

In addition to the field effort, the study team plans to incorporate several other components to the study design in the future, which will provide additional context for measuring impacts. These tasks were added in the Year 1 report but were not implemented in Year 2 and will be addressed in Year 3. The components include the following:

- Compilation of available caribou data from biological reports (ADF&G, ABR, Inc., and NSB) and distribution of these data to local hunters.
- Implement work session between hunters and biologists (from ADF&G, NSB, or ABR, Inc.) to discuss observations about impacts on caribou.

Field protocols and maps for the active harvester interviews, elder's workshop, and household surveys had been developed during Year 1. The study team revised the Year 1 active harvester protocol to reflect needed changes to Year 2 data collection. In particular, the study team added CPAI infrastructure (e.g., pipelines, roads, and pads) to the maps used during active harvester interviews and revised the 2010 active harvester protocol to focus on collecting data only for the relevant study year (rather than long-term observations) and only for CPAI related impacts. In order to reduce respondent burden, the study team eliminated questions that would not elicit new information during Year 2 interviews (e.g., questions that elicited information about long term changes in caribou rather than changes in the previous year). 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 B).

Active Harvester Interviews

SRB&A used the active harvester protocol during annual interviews with Nuiqsut caribou hunters (see Appendix C). The protocol consisted of three sections: 1) Caribou Hunting Activities; 2) Assessment of Harvested Caribou; and 3) Impacts on Caribou Hunting. A section from Year 1 entitled "General Assessment of Caribou" was removed because it elicited long-term changes that have occurred since the beginning of the Alpine Satellites development project. 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 will allow for multi-year comparison and monitoring of subsistence use data, resource observations, and impact experiences over time.

The first section (Caribou Hunting Activities) included mapping of 2009 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 2009)

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, and number of caribou harvested).

The second section of the interview (Assessment of Harvested Caribou), gathered data about the following abnormalities in the respondent's harvested caribou in 2009:

- 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
- 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 provided an estimate of 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 2009 related to CD4 or other Alpine Satellite developments. If respondents indicated that they had experienced impacts in 2009, 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 vouchers
- Subsistence representatives
- Free gas
- Local hire

During Year 1, the study team chose to collect data for 2008 as it relates to recent years, rather than only comparing 2008 activities to the previous year (2007). Using only 2008 as a baseline would not allow for the full documentation of changes that had occurred since construction of CD4 and other Alpine satellite developments. As the purpose of this study is to monitor year-to-year impacts on caribou hunting, Year 2 interviews were more focused on gathering comparative data for 2009 as they related to the previous study year (2008).

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. The NSB agreed to conduct the Year 1 household caribou harvest survey, which would be implemented by the NSB Subsistence Specialist in Nuiqsut.

However, because the 2008 household survey effort resulted in a response rate of less than 50 percent, the study team did not consider the sample representative and did not present the 2008 harvest data in the Year 1 report. When SRB&A presented the results of the 2009 hunter interviews at the NSB Department of Wildlife Management CPAI review meeting on March 16, 2010, the NSB stressed that SRB&A should communicate better with NSB employees in order to achieve an adequate response rate. SRB&A followed up with two emails in April and May 2010 to Department of Wildlife Management employees and received a response that the NSB did not have a Subsistence Research Assistant in Nuiqsut to assist with the Year 2 household harvest surveys. The lack of a NSB Subsistence Research in Nuiqsut and the lack of time to develop a new method to conduct household harvest surveys resulted in the study team not implementing household caribou harvest surveys during Year 2.

The study team met with representatives at the Nuiqsut school in September 2010 to discuss the possibility of involving high school students in the implementation of the household caribou harvest survey. SRB&A will continue to follow up with the school to implement the household surveys in Year 3.

Elder's Caribou Workshop

Similar to the household caribou harvest survey, the study team added an elder's caribou workshop as another component of the study design in response to suggestions from the Nuiqsut caribou panel. SRB&A had previously designed a protocol for the elder's workshop, which included questions about their experiences with caribou in the Nuiqsut area before Nuiqsut was resettled in 1973; their experiences

and observations when they returned to Nuiqsut in the 1970s; and their experiences and observations over the years since they returned to Nuiqsut. SRB&A was unsuccessful scheduling the workshop during the 2010 field season due to the late start of the field season and the unavailability of a number of community elders while the study team was in Nuiqsut. Individual active harvester interviews were conducted with several elders and their observations are incorporated into this document. The study team plans to attempt to schedule the elder's caribou workshop during the 2011 fieldwork season and include the results in the report for the 2010 caribou hunting season (Year 3).

Harvester Selection Process

In order to collect accurate data for the 2009 caribou hunting season, it was necessary to interview currently active caribou harvesters. All hunters interviewed in Year 1 (for the 2008 hunting season) were included in the Year 2 sample. In addition, anticipating loss of some 2008 respondents who were unavailable or did not hunt in 2009, the study team continued the original sample procedure of identifying active caribou harvesters using a "snowballing" method of informant selection (Johnson 1990). The study team augmented the Year 1 sample by interviewing residents on the original list of active harvesters prepared by the Nuiqsut caribou panel who were not interviewed in Year 1, as well as additional residents identified during Year 2 as active harvesters. At the conclusion of each interview, researchers asked each respondent to provide the names of other active caribou harvesters in the community. The study team created a list of active harvesters based on the names provided by interview respondents, and tallied the number of nominations for each active harvester. The study team attempted contact with all Year 1 respondents with the goal of achieving consistency between study years. As anticipated, not all Year 1 respondents were available to participate in Year 2 interviews 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 in 2009, 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. In some cases, these individuals were later nominated by another respondent. Fieldworkers found that these "walk-in" respondents were often active hunters and harvesters who provided informative and thorough interviews.

Interview Process

This section describes the interview process for the active harvester interviews. The contents of the active harvester interview are described above under "Study Design." Researchers generally conducted interviews at the KSOPI office, although some interviews were conducted at the residence of the respondent or at the camp 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. As noted ealier, the study team added CPAI infrastructure (e.g., pipelines, roads, and pads) to the maps used during Year 2 active harvester interviews. 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 interviewer 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.

Fieldwork Summary

The study team traveled to Nuiqsut two times to conduct interviews in April and May 2010. As shown in Table 1, SRB&A researchers interviewed 54 Nuiqsut residents. One of these respondents was an elder who had not participated in caribou hunting activities in 2009. SRB&A interviewed 60 percent (24 persons) of the individuals who were interviewed during Year 1. Of the 16 Year 1 respondents who did not participate in Year 2 interviews, three reported that they had not hunted caribou in 2009; one had passed away; one had declined to participate; seven were gone from the community for an extended period of time or had moved; and the remaining four were otherwise unavailable. SRB&A developed a list of 101 potential Year 2 respondents (Table 1), which included residents identified as active harvesters in Year 1 as well as residents nominated by active harvesters and KSOPI in Year 2.

Table 1: Fieldwork Summary, Year 2

	# of Occupied Households (2003) [1]	Population (2003)[1]	# of Persons Identified for Interviews	# of Persons Eligible for Interviews	# (%) of Eligible Respondents Interviewed	% of Year 1 Respondents Interviewed in Year 2	Number of Interview Workshops	Number of Interview Trips to Community
Nuiqsut	114	416	101[2]	88	54 (61%)	60%	49	2

Notes: [1]Source: Shepro, Maas, et al., 2003 as cited in URS Corporation, 2005. [2] Includes active harvesters nominated during Year 1 and Year 2. 25 of these individuals were nominated by KSOPI employees rather than active harvester respondents.

Stephen R. Braund & Associates, 2011.

At the time of the Year 2 interviews, 88 of the 101 persons identified as active caribou harvesters were eligible for interviews (i.e., were in town, had hunted caribou during the study year, and were able to participate) (Table 1). Of the 88 individuals who were eligible for interviews, SRB&A interviewed 54 harvesters, or 61 percent.

The following tables (Tables 2 through 5) show descriptive data for 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: Place of Mother's Residence at Birth[2]

Place Born	2008	2009
Nuiqsut	29%	40%
Other North Slope Community	60%	49%
Elsewhere in Alaska	9%	8%
Outside Alaska	3%	4%
Total	100%	100%
Number of Respondents[1]	35	53
[1]In all tables, this number represents the number of harvesters who provided a response to the question.		

Stephen R. Braund & Associates, 2011.

Table 3: Decade Born

Decade Born	2008	2009
1940s	6%	10%
1950s	17%	12%
1960s	31%	17%
1970s	20%	17%
1980s	20%	31%
1990s	6%	13%
Total	100%	100%
Number of Respondents	35	52

Stephen R. Braund & Associates, 2011.

Table 4: Years of Residence in Nuiqsut

Years Resident in Nuiqsut	2008	2009
5 years or less	6%	2%
6-10 years	3%	6%
11-19 years	11%	19%
20 plus years	80%	74%
Total	100%	100%
Number of Respondents	35	53

Stephen R. Braund & Associates, 2011.

[2] Because people in rural Alaska often travel to regional or urban hospitals to give birth, knowing mother's residence at birth is a more precise way of measuring where the harvester resided at birth.

Table 5: Respondent Gender

Gender	2008	2009
Female	3%	9%
Male	97%	91%
Total	100%	100%
Number of Respondents	37	54

Stephen R. Braund & Associates, 2011.

Birthplace, birth date, and years of residence were gathered for only 35 and 53 of the active harvesters interviewed in 2008 and 2009 respectively. Eighty-nine percent of the Nuiqsut harvesters interviewed in both 2009 and 2010 were born on the North Slope. A larger percentage of those interviewed in 2010 were born in the 1980s and 1990s than those interviewed in 2009. In addition, more of those interviewed in 2010 are female. The large majority (80 percent in 2009 and 74 percent in 2010) of respondents have resided in Nuiqsut for 20 or more years.

As stated above, the study team attempted to interview all respondents in 2009 (Year 1) again in 2010 (Year 2). Twenty-four of the 40 Year 1 respondents were interviewed again in Year 2. The Year 2 sample included 30 respondents not interviewed in Year 1. It is therefore important to keep in mind that differences in the makeup of the two samples can potentially account for observed differences in results between the two years. The results are discussed with this point in mind with comparisons of data for the two study years presented both for the entire Year 1 and Year 2 samples, as well as for the subsample of harvesters interviewed during both study years.

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 two study years is shown in Table 6. 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 6: Nuiqsut Datasets

Nuiqsut Dataset Component	# of Records	
	2008	2009
Respondent characteristics (age, residence duration, place of birth)	37	54
Subsistence use areas	136	186
Harvest locations	181	152
Observations of changes in harvest patterns	35	50
Observations of changes in condition of caribou	45	28
Impacts on harvest activities	55	93
Mitigation of impacts	27	46
Number of Respondents	35	53

Stephen R. Braund & Associates, 2011

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 2 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 186 use areas and 152 harvest locations (one of which was a polygon rather than a point and is therefore only depicted on some harvest location maps). Some features are not displayed on the maps in this report because they were reported for a previous study year (prior to 2008). 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

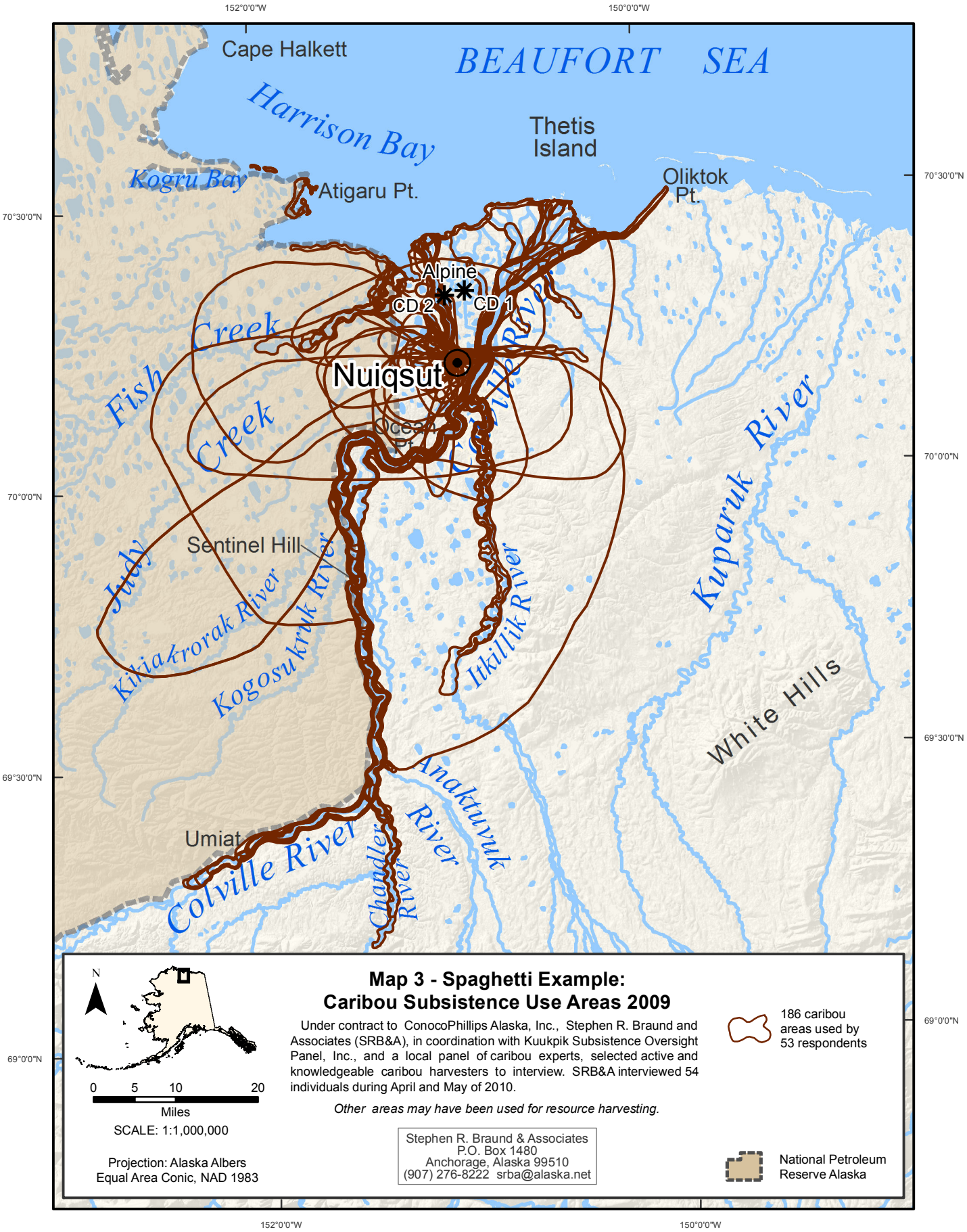
The relevant tables from the Access database were linked to the GIS database so that GIS staff could develop maps querying specific feature information. The SRB&A GIS mapping system consists of three possible methods of presenting mapped information. The first method is represented by Map 3 and is referred 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 2008 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."

Data Review

CPAI provided an initial review of the Year 2 draft report in January 2011. The study team addressed CPAI's comments and, in February 2011, sent an updated draft report to each member of the Nuiqsut Caribou Panel 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 March 24, 2011 at the North Slope Borough Department of Wildlife in Barrow. At this meeting, SRB&A presented the results of the Year 2 Draft Report. NSB reviewers provided comments at the review meeting, which resulted in the addition of an appendix (Appendix D) to clarify the study team's coding methods, as well as the addition or revision of several tables. Reviewers also provided several suggestions for future monitoring activities, including more detailed documentation of parasites (e.g., types of parasites observed in harvested caribou) and the incorporation of biological data on caribou movements and distribution.

The study team traveled to Nuiqsut and met with the Nuiqsut Caribou Panel on May 3, 2011 and KSOPI on May 4, 2011. Those panel members who were unavailable for the May 3 panel meeting and who were KSOPI board members attended the KSOPI meeting on May 4. A total of six panel members attended draft review meetings during the May trip. Panel members at both meetings provided insight into Year 2 results and provided suggestions for how the monitoring program could be improved in future study years. Comments relevant to the Year 2 results have been incorporated into the report where applicable.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CD 2
CD 1
Nuiqsut
Fish Creek
Judy Creek
Sentinel Hill
Kikiakrorak River
Kogosukruk River
Itkillik River
Kuparuk River
White Hills
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Equal Area Conic, NAD 1983
Map 3 - Spaghetti Example:
Caribou Subsistence Use Areas 2009
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 54 individuals during April and May of 2010.
Other areas may have been used for resource harvesting.
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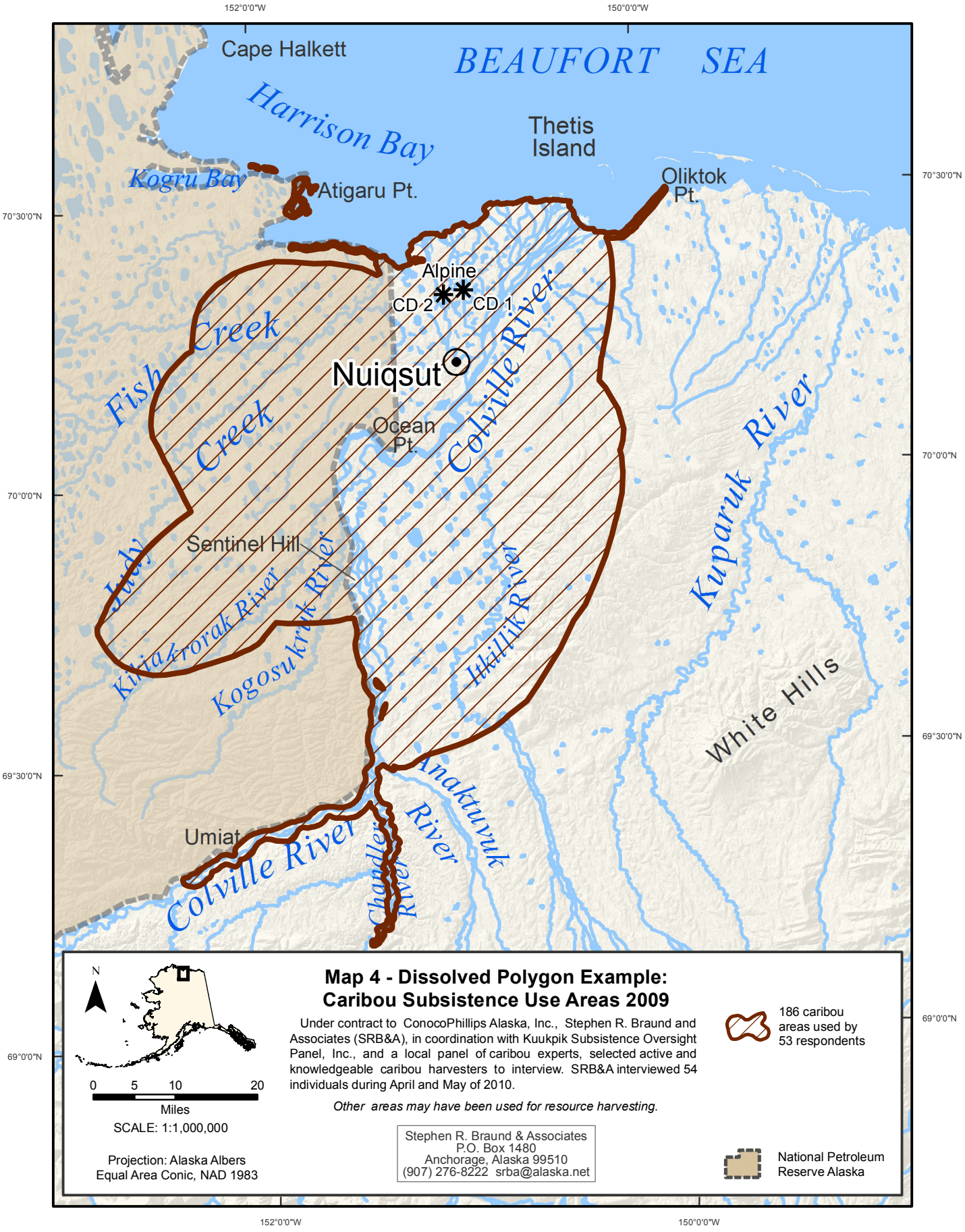
186 caribou areas used by 53 respondents
National Petroleum Reserve Alaska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Kiliakrorak River
Kogosukruk River
Itkillik River
White Hills
69°30'0"N
Umiat
Colville River
Chandler River
Anaktuvuk River
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SCALE: 1:1,000,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 4 - Dissolved Polygon Example:
Caribou Subsistence Use Areas 2009
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 54 individuals during April and May of 2010.
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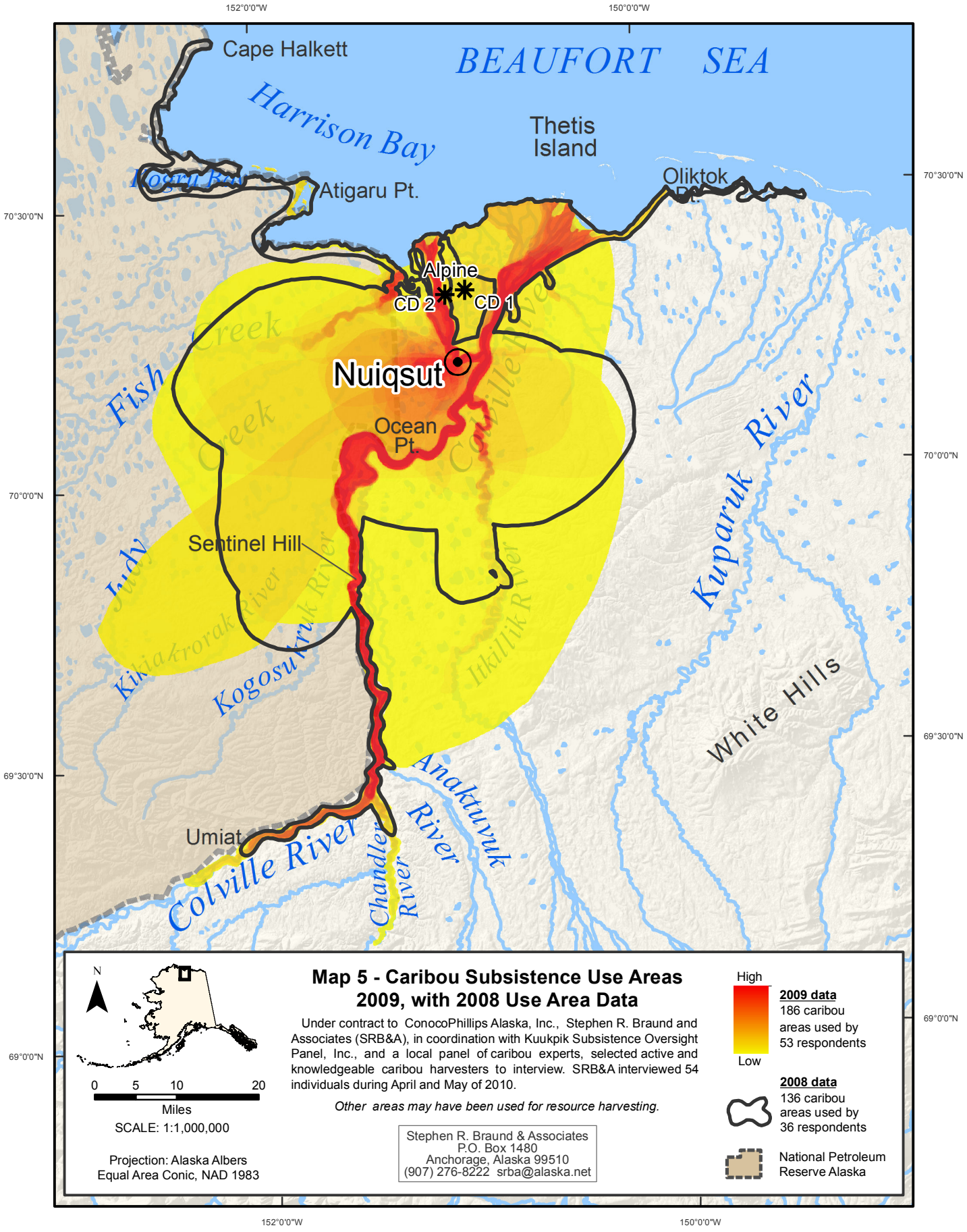
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Harrison Bay
Thetis Island
Oliktok Pt.
Atigaru Pt.
Alpine
CD 2
CD 1
Nuiqsut
Ocean Pt.
Fish Creek
Judy Creek
Sentinel Hill
Kikiakrorak River
Kogosukruk River
Itkillik River
Colville River
Kuparuk River
White Hills
Umiat
Colville River
Chandler River
Anaktuvuk River
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SCALE: 1:1,000,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 5 - Caribou Subsistence Use Areas
2009, with 2008 Use Area Data
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 54 individuals during April and May of 2010.
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High
Low
2009 data
186 caribou areas used by 53 respondents
2008 data
136 caribou areas used by 36 respondents
National Petroleum Reserve Alaska

Presentation of Interview Results

This report summarizes the results of the active harvester interviews using the verbatim 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. In some cases, respondents' observations prompted questions or comments from CPAI reviewers. Observations that appear to CPAI as inaccurate are relevant as they point to areas where additional communication or other steps could improve local and industry perceptions about Alpine development impacts. As in the Year 1 report, text box insets noted instances where industry reviewers commented on an observation and identify additional monitoring data relevant to building a common understanding of caribou harvest impacts. These suggestions are summarized in a final section of the report entitled "Implications of Hunter Observations for Additional Monitoring Components."

CARIBOU USE AREAS

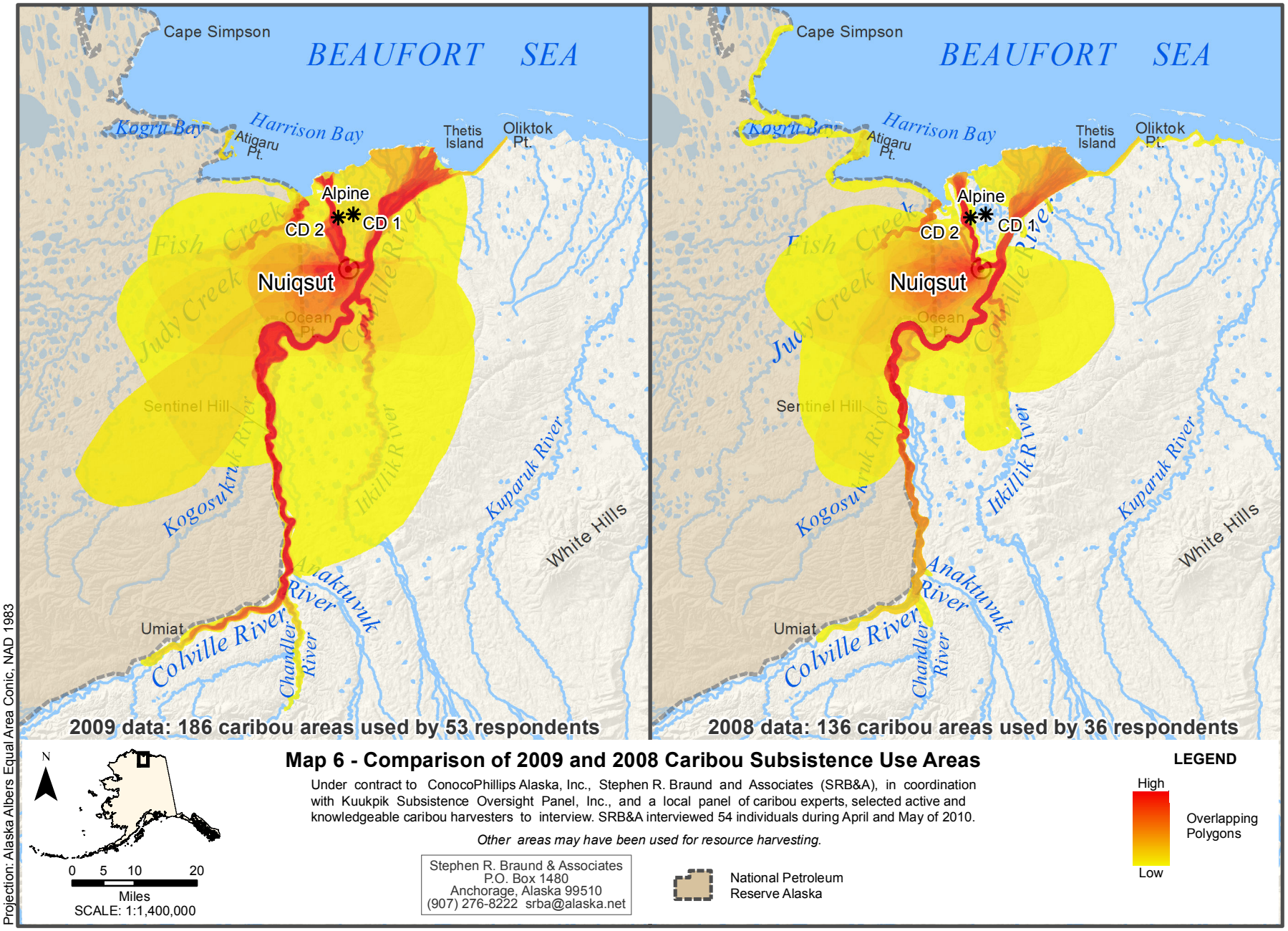
Nuiqsut respondents reported 186 caribou use areas for the 2009 study year (Year 2). The locations and characteristics of 2009 caribou use areas are described below.

Location of Caribou Use Areas

Nuiqsut 2009 caribou use areas, as reported by 53 Nuiqsut respondents, are depicted on Map 5. The extent of 2008 caribou use areas is also depicted on Map 5. The map shows residents traveling along local rivers and in the ocean along the coast, in addition to traveling overland, in search of caribou. Residents traveled south beyond Umiat approximately five miles, west along the coast to Atigaru Point, and east to Oliktok Point. Hunters traveled overland both west and east of the Colville River, in an area around Fish and Judy creeks, Itkillik River, and Kikiakrorak and Kogosukruk rivers. The highest numbers of overlapping caribou use areas occur along the Colville River on Nigliq Channel, along the East Channel, and south to the mouth of Chandler River. Other areas with high numbers of overlapping polygons include the lower portions of Fish Creek and Itkillik River. In addition, a relatively high or moderate number of overlapping caribou use areas were reported on the Colville River beyond Chandler River to Umiat, along greater portions of Fish Creek and Itkillik River; and in an overland area west and south of Nuiqsut toward Fish Creek and Ocean Point. A side by side comparison of 2008 and 2009 caribou use areas (Map 6) shows some differences between the two study years. In 2009, a high number of overlapping caribou use areas extended beyond Sentinel Hill on the Colville River and along the east channel. Hunting activities in 2009 did not extend as far along the coast as they did in 2008; however, overland (four-wheeler and snowmachine) hunting extended farther from the community in 2009.

Residents' summer and fall hunting activities occurred primarily by boat, with hunters focusing on the Colville River delta (Nigliq Channel and Kupigruak Channel) in the early summer (June) and then traveling farther from the community as the summer proceeded, to Fish Creek, Itkillik River, and along the Colville River beyond Umiat. Residents reported looking for caribou along Nigliq Channel throughout the summer as they traveled to and from fish camps or when traveling to the ocean to hunt for seals. Some residents stayed at cabins on the Nigliq Channel for extended periods of time to put up fish and hunt for caribou as the caribou crossed the channel. Other hunters traveled up and down the channel on a regular basis to check their fish nets or travel to the ocean. Respondents provided the following descriptions of their 2009 hunting activities along Nigliq Channel:

> *We go to Nigliq [with] my buddy, I usually follow him and his family. Sometimes we take a detour just to enjoy the ride. We saw caribou in there, but we didn't get any. I tried to [hunt caribou there], but I didn't get any. That would have to be in July. [My friend's] mom likes to do her fishing then, and we help her with our nets and all that. And when we do see caribou, that's when we try to get it. I would say around 10 trips.* (SRB&A Nuiqsut Interview May 2010)



Map 6 - Comparison of 2009 and 2008 Caribou Subsistence Use Areas

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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National Petroleum Reserve Alaska

LEGEND

High

Low

Overlapping Polygons

I start [hunting along Nigliq Channel] in June, right after river breakup, looking for caribou. Some people go up there and announce on VHF that there's no caribou, and sometimes they look for caribou and there are caribou and they announce on VHF that they're there. [I hunt there from] June through September, just up until freeze-up. That's how long we were boating. Even after freeze-up, we were ice breaking. I went to the ocean [hunting along Nigliq Channel] about 10 to 15 times, maybe. All of those times [I was looking for caribou]. (SRB&A Nuiqsut Interview April 2010)

On our camp here [pointing on the map], we got [one] while we were checking nets, we got one bull by our camp. We've got a camp on the, just a little ways from Nigliq. On the other side there…. We always go check, we go seal hunting, and that's our main way of going through the ocean, going this way [through Nigliq Channel]. More than 20 [times], back and forth to the ocean to hunt seals. We go out to the ocean and spend all day, all night, sometimes we stay on the ice for a day or two. (SRB&A Nuiqsut Interview May 2010)

Several respondents indicated that they were unable to harvest any caribou along Nigliq Channel in 2009 either reporting that caribou were not in the area or that they were too far inland from the riversides for hunters to reach them:

I went up to Nigliq, up to the cabin right there. Well, I set nets out there, so I go out there every day, I figure about a month and a half. It was lots of fish but no caribou. (SRB&A Nuiqsut Interview April 2010)

Yeah, I went up that way [along the Nigliq Channel] but I didn't really see anything, we went up to the Nigliq cabins there, and then that little dry river there, it's a shallow river there, I don't know what they call it. Maybe it was about ½ dozen trips, I mean, I had my net right on this beach right here, so if I didn't see anything in my net I would go down there once in a while. (SRB&A Nuiqsut Interview April 2010)

They [caribou] were hard to find last year; we went - quite a few times we went out [in the Colville River Delta] and we didn't catch any. We would go up the river and the ocean looking for seals, either this way [along Nigliq] and out through the Colville River Delta, and we didn't see any. There's different ways [you can go]. We go this way out this [east] channel, and out of this channel. And that's all by boat. (SRB&A Nuiqsut Interview April 2010)

We went up Nigliq, and we have a camp, it's on this side of the river [pointing on the map], just go look around Nigliq. That was the middle of July. About three times. Those were every other day. It depended on the wind because of the waves, we wait until a calm day and then start checking up there. There was some, but they were way out inland where you can't reach them. The ones that I saw, [there were] five out there, they were kind of big bulls and you couldn't reach them. (SRB&A Nuiqsut Interview May 2010)

Nuiqsut hunters also described hunting for caribou along the east channel of the Colville River delta, with varying success. Residents traveled along the east channel throughout the summer (beginning in June) and into the fall (September):

We went on all the channels; we went out this way and went out to the ocean and then came back on Tamayayiak. We went on rivers we didn't know were there! Usually there's no water on some of those rivers. The tide was up or something, there was a lot of water. We went through almost all of them. We didn't see anything while we were there. We didn't see any caribous. That was in early September, right after we caught these ones, then we went that way. (SRB&A Nuiqsut Interview May 2010)

I go in [Kupigruak Channel], check out the whole area, go out one way come back the other way. Maybe up to 10 times, a lot of times, huh? [I go in] end of June. That's when the caribou herd is coming close. (SRB&A Nuiqsut Interview May 2010)

During the summer seal hunting season, Nuiqsut hunters reported traveling to the ocean through Nigliq Channel and returning to Nuiqsut through the east channel of the Colville River delta. Residents searched for caribou along both channels on their way to and from seal hunting.

> *Actually, I did go to Helmrick's too. Didn't see any caribou there. And I went through both of these channels, this one here [Nigliq] and then around this one also [Kupigruak]. I think I got only one caribou last year. Maybe that [trip to Helmerick's] was around August, for whaling. Just that one time. When I go both ways I go out to the ocean, and then I look for bearded seals, and then I go in the other way [Kupigruak].* (SRB&A Nuiqsut Interview May 2010)

> *We check all along the main Colville channel. And we check in Kachemach River too, and then come out the other way. We checked that river to see if there were any caribou, and there were none in this area….. There's that one island up there, right across from Helmerick's. We were on the east side of it. And then there is another channel that we go in, this side of the main channel. This is the town here and then if we go out [to the ocean] through Nigliq then we would come back [through the] main channel here; we had to look for caribou if we didn't get any seal while we were out there.* (SRB&A Nuiqsut Interview May 2010)

A number of Nuiqsut caribou hunters reported traveling to Fish Creek periodically throughout the summer to harvest fish and hunt caribou. Some residents own cabins on Fish Creek and stay there for extended periods of time. Hunters regularly mentioned a lake along Fish Creek that they often travel through when searching for caribou. Respondents provided the following descriptions of their 2009 Fish Creek caribou hunting activities:

> *Me and my cousin went to Fish Creek in June, and we got four of them in June. [Nuiqsut Resident's] cabin, right behind his cabin, we got four caribou. He claimed two of them, and I claimed two of them. We were zig-zagging back and forth, and we were bouncing off the bank of the river just trying to get through there. [His] cabin is right around that windy part.* (SRB&A Nuiqsut Interview May 2010)

> *I went to Fish Creek and there was no caribou to be seen. I went up through this channel, right at the "Y." There were no caribou to be seen. I did [go to the lakes]. That would be about the second week of August. It had to be camping, I was gone for like five days. The gas is so expensive, you have to make the most of the trip, but [I came] home empty handed….* (SRB&A Nuiqsut Interview May 2010)

> *And I did get a few over here at Fish Creek, right by my camp over there. It was this side [pointing on the map]. Right around these lakes I want to say, two caribous, males. I went all the way as far as I can go, I went on the left side. I don't know how far, I went a long ways. I'm not sure to be exact. I want to say maybe at least 15 miles because I went maybe even more than [the lakes]. I want to say [it was] in here somewhere. I just stayed with my boat on the river. It connects to the lake and then back out. It's really shallow at the mouth of the lake, when you enter, and then especially where you go out it's really shallow.* (SRB&A Nuiqsut Interview May 2010)

A small number of respondents reported traveling along the coast to hunt caribou in 2009. One respondent described traveling to Atigaru Point and the Eskimo Islands in search of caribou with no luck, indicating that the caribou were not in their usual insect relief areas. He said,

> *There were no caribous in that insect relief area that I know of; I checked and there were none there all summer long: Eskimo Island, Kogru [River]. We were about 16 miles from Cape Halkett, but there were no caribous there. You could go into the bays, but sometimes it's too shallow [in that area]. But then sometimes it's the high tide…. We went out to that area to the east of Atigaru [Point] and this area [at the islands.] Yeah, we look on every point that we can have access to, like that. We can get on land without hitting the shallows. We did see some caribous in that area, but we could not get to them, maybe there were 10 plus. And we went into this creek, into this little*

> *river, but they just kept going further away from us. And those were the last caribou we saw in that area.* (SRB&A Nuiqsut Interview May 2010)

Residents also traveled upriver in 2009, traveling to Itkillik River, Ocean Point, Sentinel Hill, and farther south in search of caribou. Respondents generally reported taking day trips as far as Ocean Point and sometimes as far as Sentinel Hill. One individual described having relatively good success at Ocean Point in 2009 and said,

> *Ocean Point, this area is a pretty good area to go to, because it gets nice and flat and then it starts hitting the cliffs. Usually [the caribou] are always around in that general area…. Ocean Point is only a short ride from Nuiqsut. At Ocean Point we never camp out in that area.* (SRB&A Nuiqsut Interview May 2010)

Nuiqsut hunters reported traveling to Itkillik River in July and August and traveling upriver until they see an old airstrip located close to the river. Several individuals mentioned that the river has been shallower in recent years and more difficult to navigate. Hunters provided the following descriptions of their hunting activities on the Itkillik River:

> *I went up Itkillik one time, but I didn't get any. That river is starting to get shallower and shallower every year, and there's a lot of rocks, so I don't want to ruin my grandma's props. That was in July. I went two times, just to go check it out. I didn't go very far up.* (SRB&A Nuiqsut Interview May 2010)

> *Oh, Itkillik! We went almost to the old airport last year. There is a hillside there where you can spot for caribous, and we went maybe three to four times there, first week of July, maybe second week of July. But we couldn't see anything up there, that's when we started coming back this way.* (SRB&A Nuiqsut Interview May 2010)

> *Two times I believe [I went up Itkillik]. Not too far up, just went in and went out, maybe at least, like five miles in there, and then come back out. It's when I go down [Colville] it's real flat lands on that side so it's real easy to see a few animals.* (SRB&A Nuiqsut Interview May 2010)

> *In this beginning part, wherever Itkillikpa is [near the mouth of Itkillik River]. Last year we took a fan boat down the river, so we managed to go in quite a bit. We got about three caribou. It's right after this horseshoe here [pointing on the map]. It's a lot different [trip]. There were a lot of caribou in there. In that, right in that general area. That was the farthest I had ever gone up the river. The only way I got there was on that fan boat. That was the beginning of August, end of July.* (SRB&A Nuiqsut Interview May 2010)

> *But mostly it's around Itkillik River. Just right on the mouth of the Itkillik River, right there. Most of the time the river is shallow, and you have to pull the boat through the shallow parts to go to the deepest parts. Not really [successful]. Most of the time they're further up inland from the river.* (SRB&A Nuiqsut Interview May 2010)

Residents often camp or stay in cabins at Sentinel Hill in the summer and hunt caribou from there, or set up camps at various spots along the Colville river. As one hunter described,

> *I usually go to my camp [near Sentinel Hill]; that's where my cabin's at, I usually go there. [That was in] August. I went there about 10 times, maybe even more. I went all the way to Umiat. We camp over right at the mouth [of the Anaktuvuk River] there. Usually lasts about three days round trip. A day to go up, a day to scout around, and then a day to get back. I went up to the cabin twice. I just camp out at Umiat, have a bonfire and then go back.* (SRB&A Nuiqsut Interview April 2010)

A number of Nuiqsut hunters reported traveling upriver as far Chandler River and Umiat in 2009, looking for moose and caribou during the months of August and September. While the Anaktuvuk River is

generally too shallow for extensive boat travel, residents reported traveling along Chandler River substantial distances when the water is high enough. Several residents described their 2009 hunting activities in the Chandler River and Umiat areas as follows:

> *I got one caribou at the Anaktuvuk Channel [mouth]. I utilized that caribou for camping. It was a female, a small one. I utilized it for camping, for grub. I stayed until September 18th, and I lost a moose. Since I lost a moose I had to catch caribou, so I caught three more caribous and they were all healthy upriver. [They were on] Chandler River, on the inside [of the river], about three miles inside. That would be about right; right there [pointing on the map]. And my load to pack up three caribou was good enough, so I camped out and enjoyed myself until freeze-up. I was one of the last hunters to come back. They were all males [the Chandler River caribou]. They all had big antlers; they were healthy caribou…. I went as far as almost Wolf Creek. I went way up. I went about five miles above Umiat. And I didn't spot anything in that area. There was no caribou. I didn't see any. They were probably in the bushes. We always go on the higher [side] to scout out with binoculars, and there was nothing to be seen. I stayed on the main river.* (SRB&A Nuiqsut Interview May 2010)

> *I went all the way to Chandler, not past Chandler last year. I got three of them right there. I went out camping right there for about three days. Inside, I went about maybe a mile inside Chandler, yeah. Nice country. I got three of them, it was on the west side. Nice area up there, very beautiful.* (SRB&A Nuiqsut Interview May 2010)

In addition to traveling by boat to hunt caribou, Nuiqsut hunters also traveled by four-wheeler, snowmachine, and truck (along the ice roads) during the fall and winter months of 2009 in search of caribou. During the fall and early winter, residents often hunt caribou in an area between Nuiqsut, Ocean Point, and Fish Creek by four-wheeler. This often occurs after whaling crews return from Cross Island in September and October. Respondents described,

> *[Caribou hunting] was the whole west side, Ocean Point to four miles from Fish Creek, right over there. Well, we could have started from this side to Meltwater, [but] most of my trips were just this side, the west side, in late September. [We went] four to five times.* (SRB&A Nuiqsut Interview May 2010)

> *I went [caribou hunting] after we did our whaling, with my four-wheeler. And I saw some on the other side of this creek [Fish Creek], right over here. It was the last week of September, but I couldn't cross that creek. They were on the other side of this creek, Fish Creek.* (SRB&A Nuiqsut Interview May 2010)

> *[With] four-wheeler, I came across this channel over here [north of Nuiqsut]; we have a trail. Sometimes we go over here, get in here to this channel. This was in fall time, before winter came. Caribou, that was about three or four of them. [I was] maybe about five miles [from Nuiqsut]. I was close to that creek, what you call it, about eight miles from here. Yes, I go back here [pointing west of Nuiqsut on the map] too. This whole area I hunt caribous with the four-wheeler. But I can see over there, I always see nothing over there, and I know that people might be here scaring caribou out this direction, so I do that every day with the four-wheeler. With the four-wheeler after I come back from whaling, then I go out maybe about four times. I didn't catch any the first time, then there was the time that I saw the one on that high spot, but my rifle wasn't shooting so good, so I come back home. And then I go back the next day and that caribou was still there and I get him. He was a nice one, a bull one. I don't catch the females during the fall time, let them have some calves.* (SRB&A Nuiqsut Interview May 2010)

Residents described covering larger areas by snowmachine during the winter months, once the rivers are crossable. Hunters searched for caribou (often while hunting wolf and wolverine) both west and east of the Colville River in an area surrounding Fish Creek, Judy Creek, Kikiakrorak River, Colville River, and Itkillik River (Map 5). Residents reported covering a slightly larger overland area in 2009 than they did in

2008 (Map 6). Several respondents indicated that there were few caribou in their usual hunting area during the winter of 2009. Nuiqsut caribou hunters provided the following descriptions of their winter hunting activities:

> *Yeah [we hunted in winter], but we didn't have any success. We [stay] below the hills, and then [travel] around this [west] side [of the Colville.] No, not this year [we didn't hunt on the east side of the Colville], we're limited on the east side. [My sons] are out there looking for whatever they could find, if they come across the wolf they get it, or if they come across the caribou they get it, they take their chances out there.* (SRB&A Nuiqsut Interview April 2010)

> *Yeah, I did [hunt] in the winter… it was between Nuiqsut and Ocean Point. I think we got about maybe about two that I had actually gotten. When we went there, they were very hard to find in that general area, but they are always scattered about in that area. If I had to guess, it would have to be give or take 10 miles out [from Nuiqsut]. There is like a hill that has a tripod on it. You get on top and you can see a ways. [I took] quite a few trips, actually.* (SRB&A Nuiqsut Interview May 2010)

> *Let's see, I went all the way up to here, this area over here [Judy Creek] I got my wolf somewhere in there. And then all the way to Anaktuvuk River. I didn't cross Anaktuvuk this year. But then this whole area over here [Itkillik River], yep. Kogosukruk, over that way, I don't follow the river, I don't like to follow the river because it's too much sand and gravel. December…. In November, it was right over here by Alpine, those was females; I don't get the males in the winter, they are stinkers. I got two caribous there, and then four almost in the same place. They made a trail over there around in there. I got those four females at Nanuq…. I crossed that road over there, Meltwater road, and went all the way down that way.* (SRB&A Nuiqsut Interview May 2010)

Characteristics of Caribou Use Areas

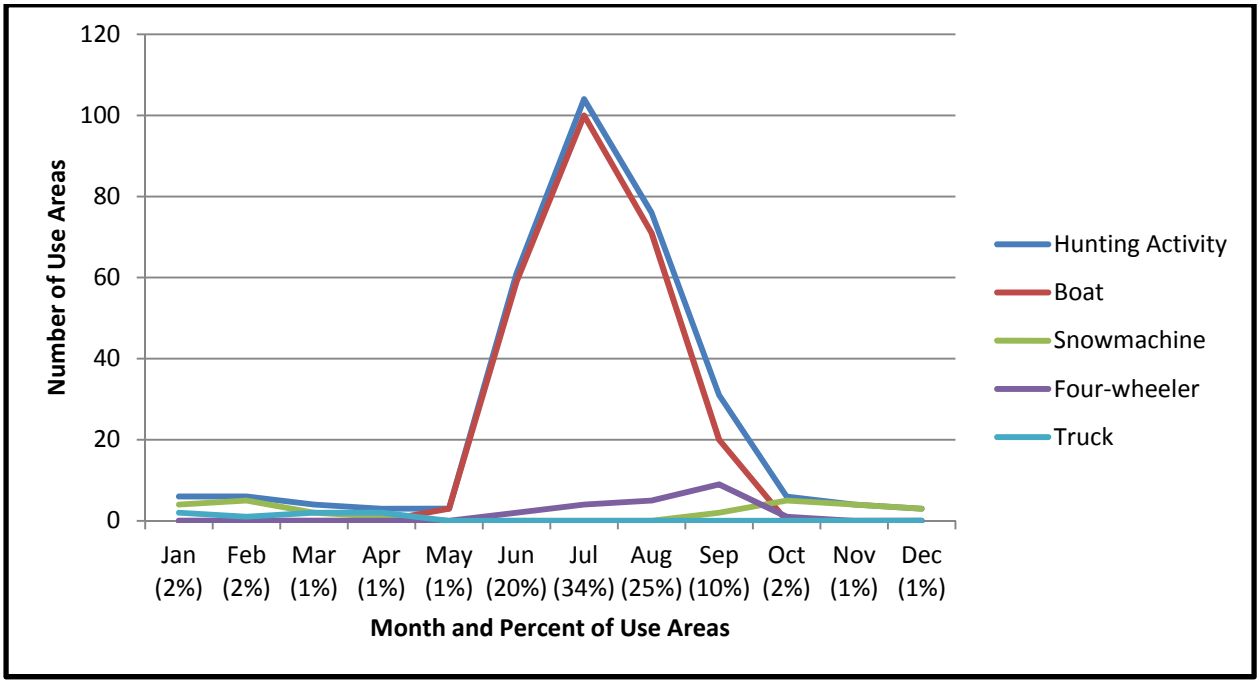
Study participants characterized their 2009 caribou use areas for the following variables: success, number of trips, duration of trips, travel method, and harvest month. Caribou harvest activities occurred in every month of the past reporting year. The principal harvest months in 2008 were June to November and in 2009 were June to September (Figures 1 and 2). In 2009 (compared to 2008), Nuiqsut caribou harvester respondents reported a relatively higher percentage of use areas during the month of June (20 percent, versus eight percent in 2008), and a smaller percentage of use areas during the winter months of October through March. During both years, the peak months of caribou hunting activity occurred in July and August.

As shown in Figure 1, boating activity began in June and extended until September. Map 7 depicts Nuiqsut caribou subsistence use areas by method of transportation. Residents traveled by boat along major waterways in the area as well as along the coast west and east of the Colville River delta. A high amount of boat activity was reported along Nigliq Channel and up the Colville River to Sentinel Hill. A moderately high number of overlaps also occur along the east channel of the Colville River, beyond Sentinel Hill along the Colville River to the mouth of Chandler River, and along the lower portions of Fish Creek and Itkillik River. In general, residents reported traveling farther along rivers in creek in 2009 compared to 2008, but traveled a shorter distance along the coast looking for caribou. Residents described their 2009 summer boating season as follows:

> *[Caribou hunting] was all summer long, from shortly after the ice went out and then all summer long, it seemed like every couple of weeks. I went for rides [in September]. September is usually when we go moose hunting and we go far up.* (SRB&A Nuiqsut Interview May 2010)

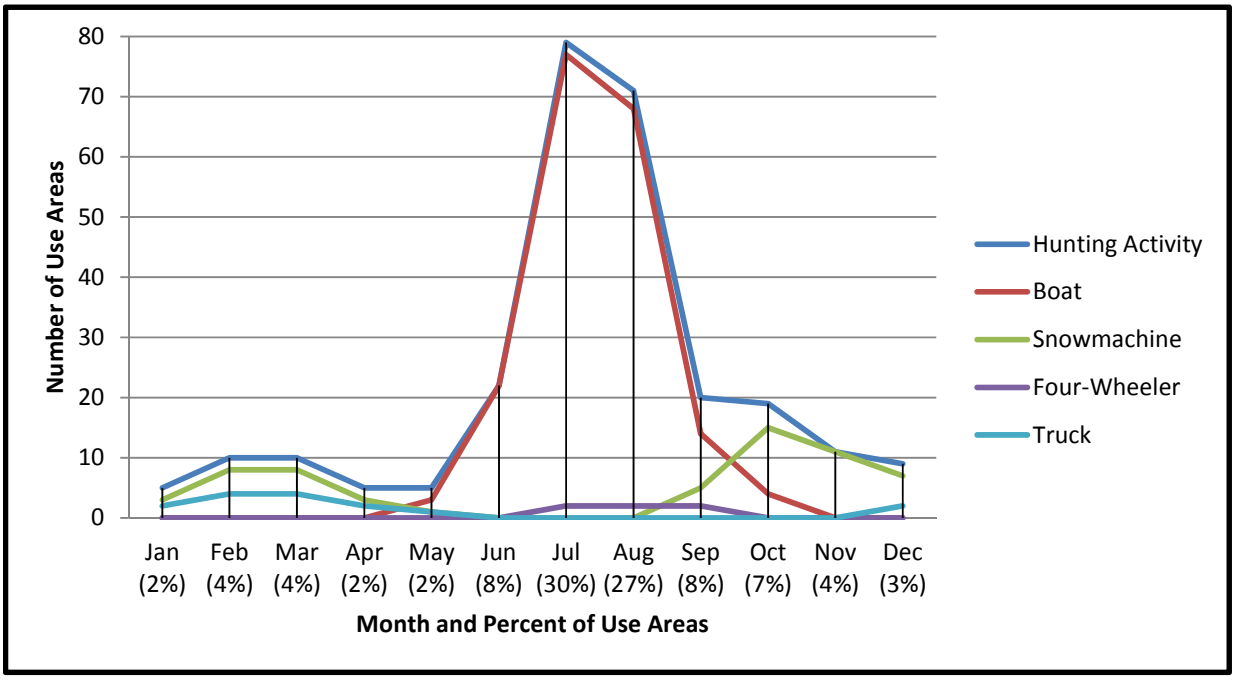
> *I'd say [I started hunting by boat] in June, July. I think it's June and July. I go along that river [Nigliq] the whole summer, also in August, all the way until the fall time, and then I start to go upriver.* (SRB&A Nuiqsut Interview May 2010)

Figure 1: Nuiqsut Caribou Harvest Activity by Travel Method and Month, 2009

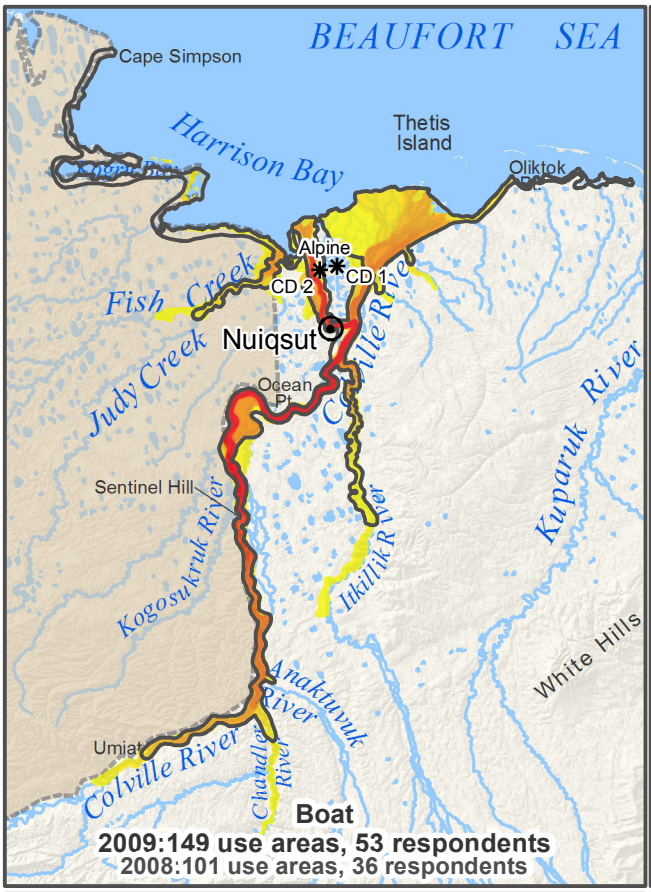


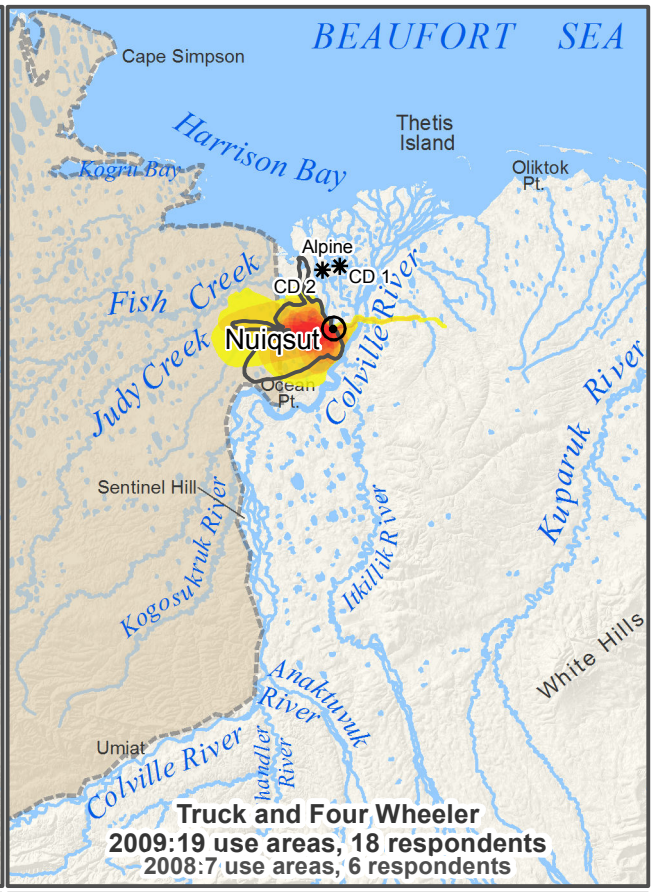
Stephen R. Braund & Associates, 2011.

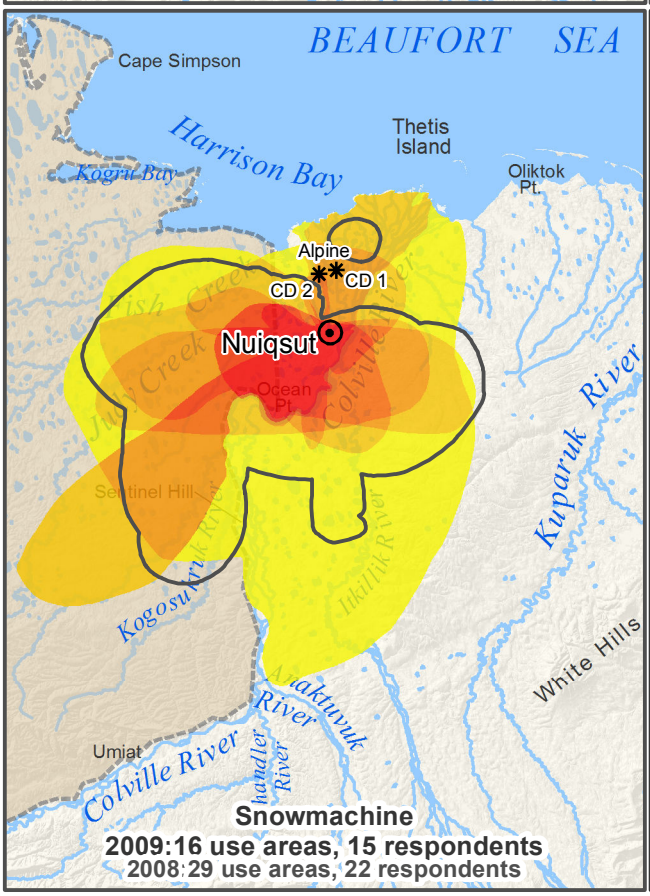
Figure 2: Nuiqsut Caribou Harvest Activity by Travel Method and Month, 2008



Stephen R. Braund & Associates, 2011.







Map 7
Method of Transportation to Caribou Subsistence Use Areas 2009, with 2008 Use Area Data

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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Anchorage, Alaska 99510
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LEGEND

High

Low

2009 data
Overlapping Polygons

2008 data
Dissolved Polygons

National Petroleum Reserve Alaska

N

0 5 10 20
Miles

SCALE: 1:1,700,000

Projection: Alaska Albers Equal Area Conic, NAD 1983

I probably [started hunting] about right after ice break up…. Starting in June, mid-June or early June. Last time [I went boating] was mid-September, maybe early October. (SRB&A Nuiqsut Interview May 2010)

A small amount of four-wheeler travel occurs during the summer months of July and August; however, the peak month for hunting by four-wheeler in 2009 was September. During the winter months (from January through April) a small number of local hunters look for caribou along the ice roads. One resident described,

[I hunted caribou] with my truck on the ice road, and that was towards 2L pad, on the ice road. That's going up towards Deadhorse. Through the ice road, yeah. We follow the pipeline. 2L pad, pipeline. It was pretty close to the pipeline, actually. Just [got] one there, a female. That was January, somewhere around there [pointing on the map]. Just that one time [went out there]. I was on my way back home from Deadhorse. (SRB&A Nuiqsut Interview May 2010)

Ice road hunting areas are visible on Map 7 extending east of Colville River. Four-wheeler hunting occurred west of the community toward Fish and Judy creeks. In 2009, snowmachine activity started in October and extended until March (Figure 1). Residents reported hunting caribou by snowmachine around the Colville River delta, west of the Colville River around Fish and Judy creeks, and east of the Colville River in an area extending from the coast to Anaktuvuk River. The highest number of overlapping snowmachine areas occurred west of the community between Colville River, Ocean Point, and Judy Creek (Map 7).

Respondents reported a lower successful harvest rate in caribou use areas in 2009 compared with 2008 (61 percent versus 78 percent, Table 7). This change can also be seen when only viewing the responses of study participants interviewed during both study years, indicating that the decline in use area success is not attributed to the different Year 2 harvester sample.

Table 7: Percentage of Caribou Use Areas in Which Respondents Reported Successful Harvests, Nuiqsut, 2008 and 2009

Harvested Caribou in Use Area	2008	2009	Respondents Interviewed During Both Study Years	
			2008	2009
Yes	78%	61%	77%	60%
No	22%	39%	23%	40%
Total	100%	100%	100%	100%
Number of Harvest Areas:	138	186	82	97

Notes: Tables showing percentage of use areas are based on the number of use areas for which Nuiqsut respondents provided a response. Thus, the number of use areas may vary between tables.

Stephen R. Braund & Associates, 2011.

During Year 2 interviews, residents reported varying success depending on the areas where they hunted; several individuals noted that caribou were less available along the Nigliq Channel in 2009, and others commented that their winter hunting efforts were unsuccessful (which may explain why a smaller percentage of winter use areas were reported for 2009). Residents provided the following observations regarding unsuccessful use areas in 2009:

I usually catch some in here, along these small rivers [East Channel, Colville River], there's usually some in there, but last year there wasn't…. Yes, we even go in this small channel [on the

East Channel]; there's that mound right there. We pass the mound, and it starts getting shallow. We were seeing caribou, alright, but they were getting too far away. Same thing over here [on Nigliq Channel]; we saw caribou, but they were just too far. (SRB&A Nuiqsut Interview April 2010)

I] just [took] one trip [along Kupigruak Channel]. I saw two of them right by the pipeline, but they were already spooked [couldn't get them]. We were camping on the sandbar. Right here. Right on this corner, on the sandbar. (SRB&A Nuiqsut Interview April 2010)

Just the Itkillik River. I went about two to three times in the month of [July and August], you know the gas prices are high. Camping for two to three days at the most, but we don't see any caribous so we come back home. We usually camp out for two to three days at the most. Maybe we try to wait for the caribous to come towards the Itkillik River, but they mostly travel up inland. They usually travel right by the river but ever since Alpine was discovered, the pattern of the migration has gone through south mostly.

And I traveled along this area [pointing on the map], and sometimes this area and [saw] nothing in that area during winter. That was after freeze up, after we have access to go across the rivers. Last October, from here I went out that way, and then came over, pretty close to that CD 3. Went to Fish Creek and checked those, and then over to Judy Creek, because most of the time we usually go straight west for caribous because we know where they are at, but there are no caribous. Then I come across Colville, and go across and go to our cabin, it's at the mouth of Itkillik River. (SRB&A Nuiqsut Interview May 2010)

Tables 8 and 9 show the percentage of caribou use areas by frequency of trip and duration of trip. Over 80 percent of caribou use areas typically involve trips completed on the same day (87 percent in 2008 and 81 percent in 2009, Table 8). Even when considering the longest trips taken, over half of subsistence use areas were visited during same day trips (70 percent in 2008 and 63 percent in 2009). In 2008, 24 percent of the longest trips to caribou use areas lasted two nights or longer. In 2009, the percentage of longest trips taking two nights or longer increased to 32 percent. When viewing the subsample of harvesters interviewed in both 2008 and 2009, there is less variation between the 2008 and 2009 study years in terms of trip duration.

Table 8: Caribou Hunting Trip Duration, Nuiqsut, 2008 and 2009

Harvesting Trip Duration	Percentage of Use Areas							
	Typical Trips		Longest Trips		Respondents Interviewed During Both Study Years			
					Typical Trips		Longest Trips	
	2008	2009	2008	2009	2008	2009	2008	2009
More than 2 weeks	0%	1%	1%	2%	0%	0%	0%	0%
1-2 Weeks	1%	1%	3%	6%	0%	1%	2%	4%
2-6 Nights	7%	15%	20%	24%	9%	10%	21%	20%
1 Night	5%	2%	6%	5%	5%	2%	9%	5%
Same Day	87%	81%	70%	63%	86%	87%	68%	71%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Number of Use Areas:	135	176	97	163	81	89	56	75

Stephen R. Braund & Associates, 2011.

Table 9: Caribou Hunting Number of Trips, Nuiqsut, 2008 and 2009

	Percentage of Use Areas			
			Respondents Interviewed During Both Study Years	
Number of Trips	2008	2009	2008	2009
6-20	30%	28%	30%	33%
4-5	23%	21%	22%	21%
2-3	27%	26%	27%	27%
1	20%	24%	21%	20%
Total	100%	100%	100%	100%
Number of Harvest Areas:	121	174	73	92

Stephen R. Braund & Associates, 2011.

Map 8 depicts residents' same day use areas and use areas in which they stayed one or more nights. As would be expected, the highest number of Nuiqsut caribou harvester respondents' day trips are located closer to the community along the Colville from the Nigliq Channel and upper delta area south to Ocean Point as well as in overland areas, which were used primarily during the winter months. When residents stayed for one or more nights while hunting caribou, they reported the majority of those trips to be south of the community along the Colville River. Nuiqsut respondents' frequency of trips to caribou use areas in 2009 ranged from one trip per year (24 percent of use areas) to between six and 20 trips per year (28 percent) (Table 9). Residents' trip frequencies were similar in 2008 and were even more similar when only viewing the subsample of harvesters interviewed during both study years (Table 9).

Study participants explained that multiple trips were often necessary in order to harvest the caribou they needed or to help other families harvest their caribou; furthermore, longer trips were sometimes necessary to harvest caribou in order to save on gas expenses (e.g., reducing the number of trips back and forth from the community). If residents are unsuccessful in a particular area, they will often stop traveling that area altogether in an effort to avoid wasting gas, resulting in a lower number of trips to an area.

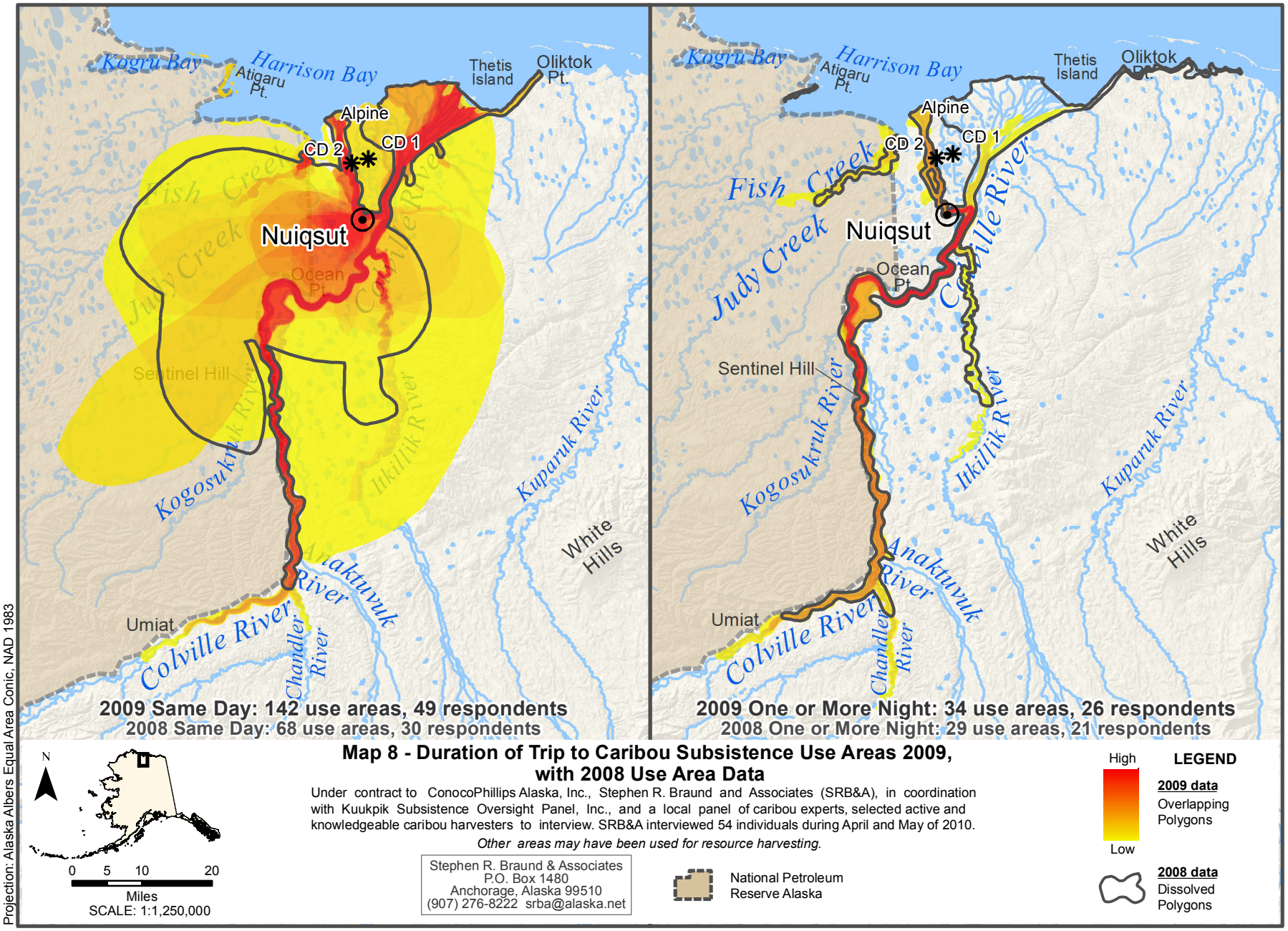
Lack of transportation (e.g., broken outboards and snowmachines) also limited some residents' frequency of trips in 2009. When asked about the number and duration of trips they took to caribou use areas in 2009, Nuiqsut respondents provided the following responses:

> *Just the one trip I went with a four-wheeler. That was the farthest I went out [pointing on the map]. That was the only caribou I saw out that way. I blew a cylinder on my four-wheeler, and that's why I never went out again with my four-wheeler. I blew it going over marshy ground.* (SRB&A Nuiqsut Interview May 2010)

> *We go to my grandma's camp the whole time from the end of July until the end of September. Probably about 10 times, it costs too much just to go travel there. That's our first camp, and then we set the other camp later. Usually [we spend] one night, the longest was probably about four days.* (SRB&A Nuiqsut Interview May 2010)

> *About four trips. The longest was a weekend. On the weekend or it depends on how many boats goes up there, and if we get a day off or two. Sometimes weekdays when there is less boat traffic up there.* (SRB&A Nuiqsut Interview May 2010)

> *I'd say two to three times. Because the gas is so expensive here. It would be a day trip. If we're going camping, we'd go there like [an additional] two to three times, also. We'd be out there for at least three or four days. We try to spread out our gasoline, just stay out there longer.* (SRB&A Nuiqsut Interview May 2010)


Kogru Bay
Harrison Bay
Atigaru Pt.
Thetis Island
Oliktok Pt.
Alpine
CD 2
CD 1
Nuiqsut
Ocean Pt.
Fish Creek
Judy Creek
Colville River
Sentinel Hill
Kogosukruk River
Itkillik River
Kuparuk River
White Hills
Umiat
Anaktuvuk River
Chandler River
Colville River
2009 Same Day: 142 use areas, 49 respondents
2008 Same Day: 68 use areas, 30 respondents
2009 One or More Night: 34 use areas, 26 respondents
2008 One or More Night: 29 use areas, 21 respondents
N
0 5 10 20
Miles
SCALE: 1:1,250,000
Projection: Alaska Albers Equal Area Conic, NAD 1983
Map 8 - Duration of Trip to Caribou Subsistence Use Areas 2009, with 2008 Use Area Data
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 54 individuals during April and May of 2010.
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National Petroleum Reserve Alaska
LEGEND
High
Low
2009 data
Overlapping Polygons
2008 data
Dissolved Polygons

About three days, three four days at the most [we camp]. Other times we went two or three days. We usually are out camping, because of the high price of gas, we have to use the best use of our gas and spend lot of time to hunt…[After] four or five times, if we find out they're not around, we stop looking for them. If there's no caribou around, what's the use of wasting gas? (SRB&A Nuiqsut Interview May 2010)

That was right around January and December, the previous January, 2009. That was kind of right around the CD area. But I didn't see any there. That was just a couple of times; that was just two times that I went. I didn't go anymore after that, I know I wouldn't find any, so I just stopped wasting gas. (SRB&A Nuiqsut Interview May 2010)

HARVEST SITES

In addition to providing the location of their 2009 caribou use areas, respondents identified the location of their harvest sites within each use area. They also reported the number of caribou harvested and the harvest month.

Location of Harvest Sites

Map 9 shows the location of Nuiqsut respondents' 2009 caribou harvest sites compared to their 2008 harvest sites. Overall, respondents reported harvest sites over a broad area from as far south as near Umiat, west to Fish Creek, east along Kachemach and Miluveach rivers, and north to the mouth of the Colville River. The majority of their reported harvest locations occurred along the Colville River, particularly between Nigliq Channel and Sentinel Hill. The overland area west of the community also show a high number of harvest sites. Other than the area around the mouth of the Itkillik River and around Kachemach and Miluveach rivers, few harvests occurred east of the Colville River in 2009.

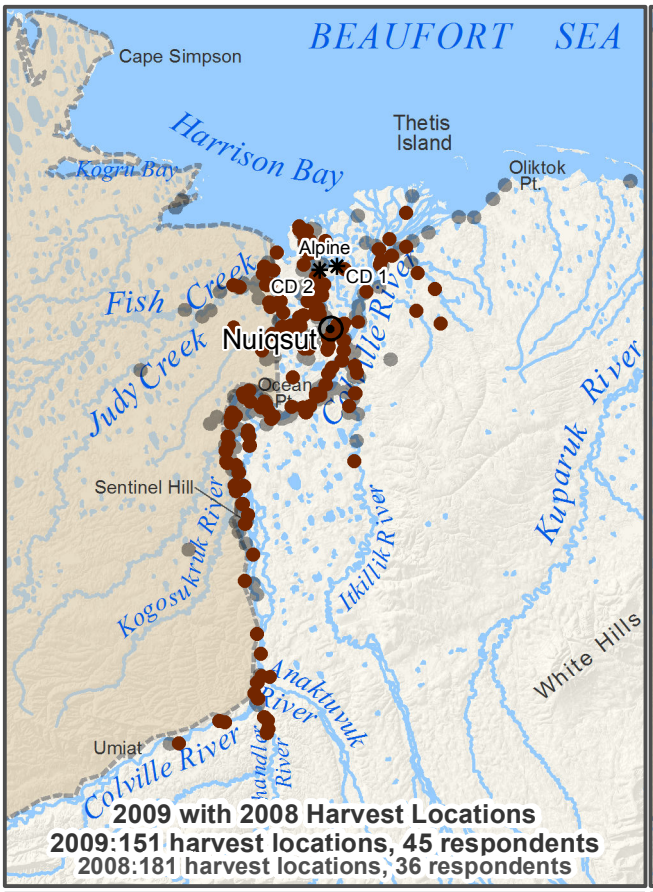
Characteristics of Harvest Sites

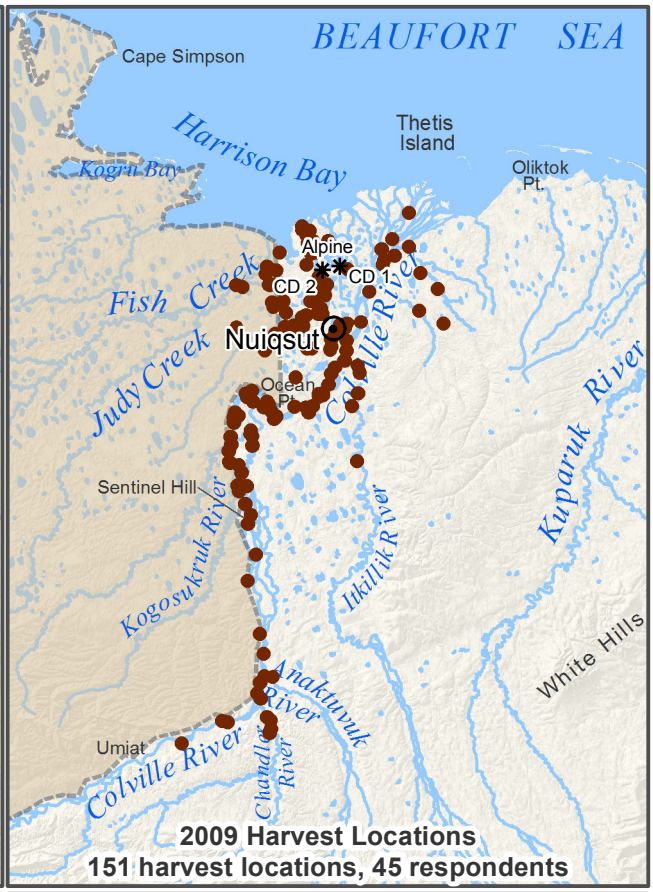
In 2008 study participants reported 181 harvest locations, accounting for 368 harvested caribou by 36 respondents; in 2009, the number of respondents reporting harvest locations increased from 36 to 45 but the number of caribou harvested decreased from 368 to 277 (a 25 percent decrease) and the number of harvest locations decreased from 181 to 152 (Table 10, Map 9). A comparison of harvests in 2008 and 2009 for the subset of individuals interviewed in both 2009 and 2010 shows a decrease in harvest from 175 to 144 (an 18 percent decrease, Table 11). Regarding the decline in reported caribou harvests from 2008 to 2009, panel members attending the May 3 review meeting suggested that there was increased activity in 2009 related to studies associated with the proposed bridge over Nigliq Channel.

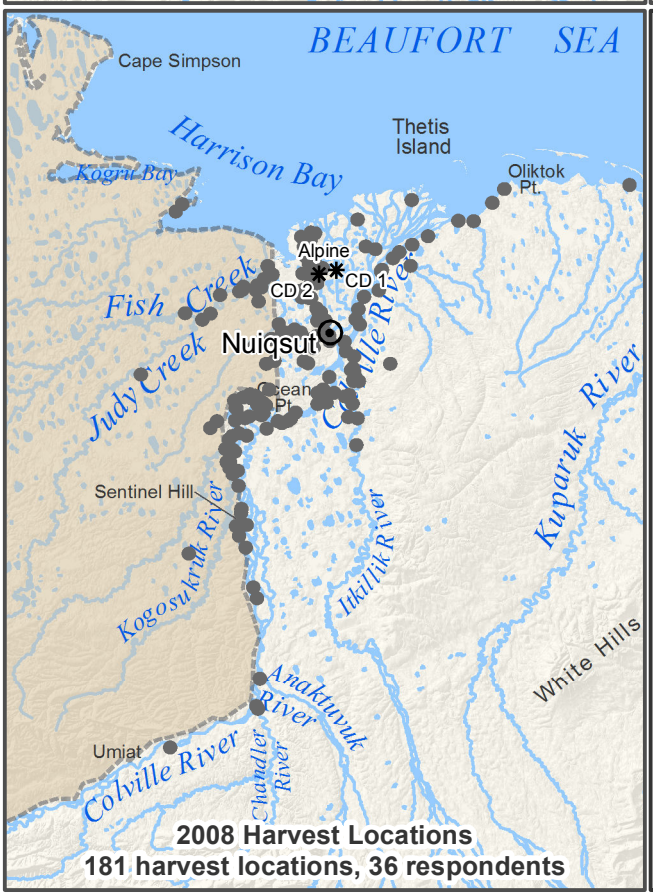
Table 10: Number of Caribou Harvest Locations, Harvest Numbers, and Harvester Respondents by Study Year

	2008	2009
Number of Caribou Harvester Respondents	36	45
Number of Caribou Harvest Locations	181	152
Number of Caribou Harvested	368	277

Stephen R. Braund & Associates, 2011.







Map 9
Caribou Harvest Locations 2009, with 2008 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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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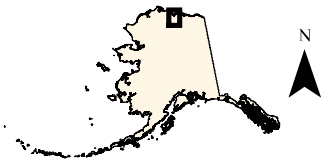
LEGEND

2009 data
151 caribou harvest locations
45 respondents

2008 data
181 caribou harvest locations
36 respondents

National Petroleum Reserve Alaska



0 5 10 20
Miles

SCALE: 1:1,700,000
Projection: Alaska Albers Equal Area Conic, NAD 1983

Table 11: Comparison of Caribou Harvests by Respondents Interviewed in 2008 and 2009

Number of Caribou Harvested by Respondents Interviewed in Both 2009 and 2010	Number of Respondents	
	2008	2009
2	1	1
3	2	2
4		2
5		1
6	2	5
8	2	1
9	2	2
10	3	
11	2	
12		1
14	2	
15		1
17	1	
18		1
22		1
24	1	
Number of Respondents	18	18
Number of Harvested Caribou	175	144

Stephen R. Braund & Associates, 2011.

The distribution of harvest by month did not change significantly (Table 12), although a higher percentage of harvests occurred in September in 2009 (15 percent) compared to 2008 (8 percent) as well as in June (12 percent in 2009 compared to eight percent in 2008). August harvests, however, declined by 10 percentage points in 2009 compared to 2008. The distribution of caribou harvests in 2009 is similar to that in 2008, being concentrated in July and August (Table 12). The high number of caribou harvests in July and August correspond with the increase in hunting activity depicted above in Figure 1. In 2008, 85 percent of the harvest occurred in the months of June, July, August and September, and in 2009, 90 percent of the harvest occurred in those four months. The majority of caribou harvested (224 of 277) were males (Table 13).

Table 12: Caribou Harvests by Month, Nuiqsut, 2008 and 2009

	Number of Respondents		Number Harvest Locations		Number Harvested		Percent of Harvest		Map Number
	2008	2009	2008	2009	2008	2009	2008	2009	
Jan	3	1	3	1	4	1	1%	0%	Map 10
Feb	4	1	6	1	8	2	2%	1%	Map 10
Mar	4	1	4	2	6	3	2%	1%	Map 10
Apr	3	1	3	2	7	3	2%	1%	Map 11
May	1	0	1	0	1	0	0%	0%	Map 11
Jun	12	12	16	16	32	33	8%	12%	Map 11
Jul	30	29	62	59	130	103	33%	37%	Map 12
Aug	23	28	62	39	142	73	36%	26%	Map 12

	Number of Respondents		Number Harvest Locations		Number Harvested		Percent of Harvest		Map Number
	2008	2009	2008	2009	2008	2009	2008	2009	
Sep	6	17	10	25	30	42	8%	15%	Map 12
Oct	9	3	10	3	17	4	4%	1%	Map 13
Nov	3	2	7	4	12	11	3%	4%	Map 13
Dec	4	1	5	1	8	2	2%	1%	Map 13
Notes: Some harvest locations were entered under more than one month if the respondent could not remember the exact month; thus, the harvest numbers in this table do not represent the actual number harvested.									

Stephen R. Braund & Associates, 2011.

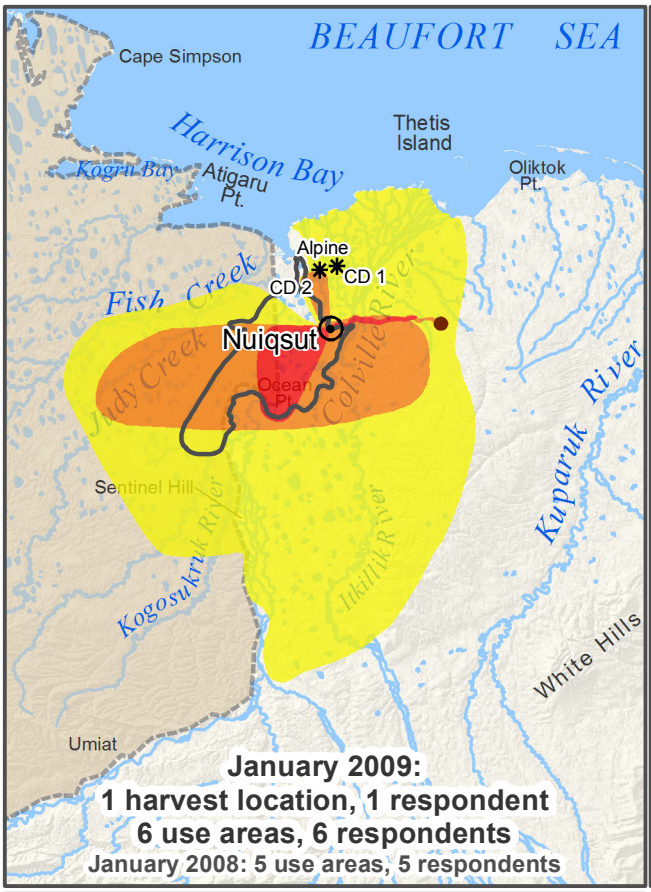
Table 13: Number of Caribou Harvested by Sex, 2009

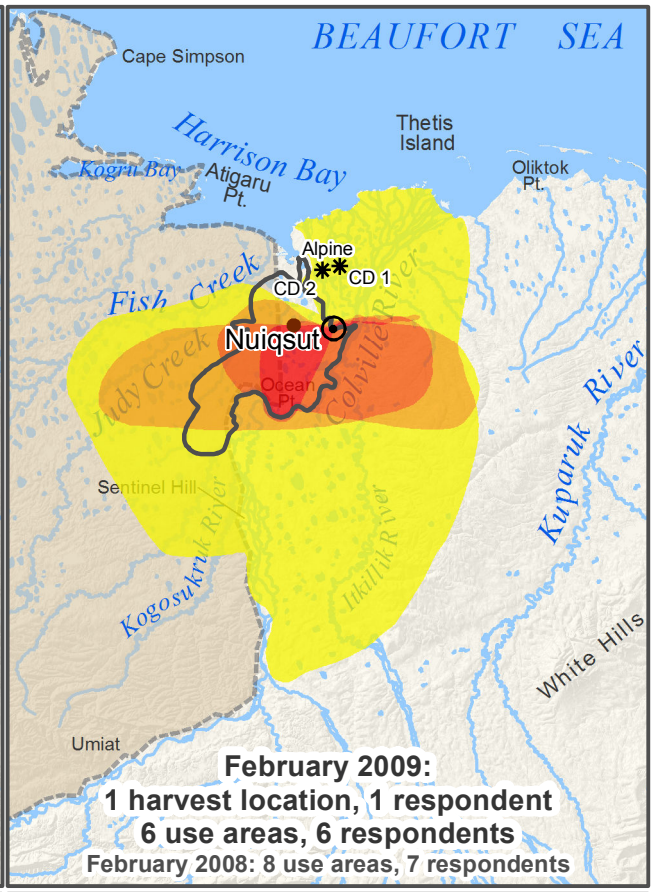
Sex	Number of Caribou Harvested
Males	224
Females	38
Unknown Sex	15
Total Caribou	277

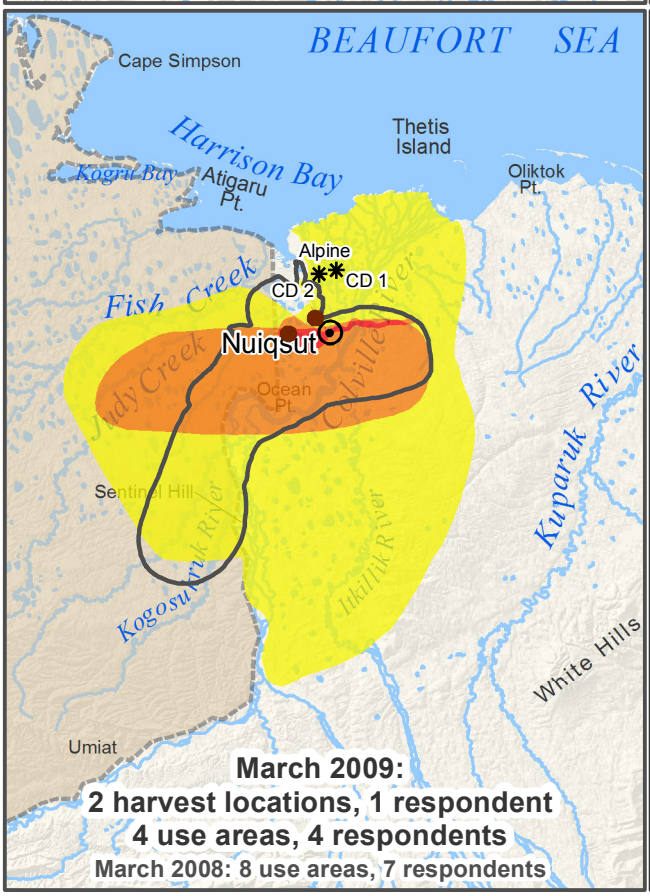
Stephen R. Braund & Associates, 2011.

Maps 10 through 13 show Nuiqsut 2009 caribou use areas and harvest locations by month, with 2008 use areas also shown. From January through March, a small number of residents traveled overland in an area surrounding Nuiqsut and along an ice road east of the community. April and May show a limited amount of caribou hunting activity in the vicinity of Nuiqsut (Map 11); however, hunting activities increased in June, with residents traveling along Nigliq Channel, Colville River, and Fish Creek. Hunting activities in June are focused along Nigliq Channel and along Colville River to Ocean Point and harvest locations were reported primarily in the Colville River delta and at Fish Creek. July shows a high concentration of overlapping use areas along Nigliq Channel and upriver along the Colville to Sentinel Hill, whereas August hunting activities occurred primarily south of the community along the Colville River beyond Sentinel Hill (Map 12). Harvest locations during the months of July and August were reported at various locations along the Colville River, Nigliq Channel, and Fish Creek. Maps 11 and 12 show a steady shift of use areas from the north (Nigliq Channel, Fish Creek, and in the Colville River delta) to the south (upriver on the Colville) as the summer proceeded. September and October show increasing overland usage and harvest locations west of the community while November and December show more extensive overland usage in an area surrounding the Colville River (Map 13).

Table 14 breaks down the percentage of caribou harvest locations and the percentage of caribou harvested by 11 caribou hunting areas. The study team identified these 11 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 14). The study team's grouping of caribou hunting areas was confirmed by panel members at the May 2011 panel review meetings. The study team then counted the number of harvest locations and the number of harvested caribou in each of the areas and compared the percentages from 2008 and 2009. In general, the distribution of harvests and harvest locations by geographic caribou hunting area did not change significantly between 2008 and 2009. A higher percentage of harvests came from the Chandler River/Umiat area (11 percent) in 2009 than in 2008 (three percent). No coastal harvests were reported in 2009, whereas coastal harvests accounted for four percent of the total caribou harvest in 2008.







Map 10
Caribou Subsistence Use Areas and Harvest Locations January, February and March 2009 with 2008 Use Area Data

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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LEGEND

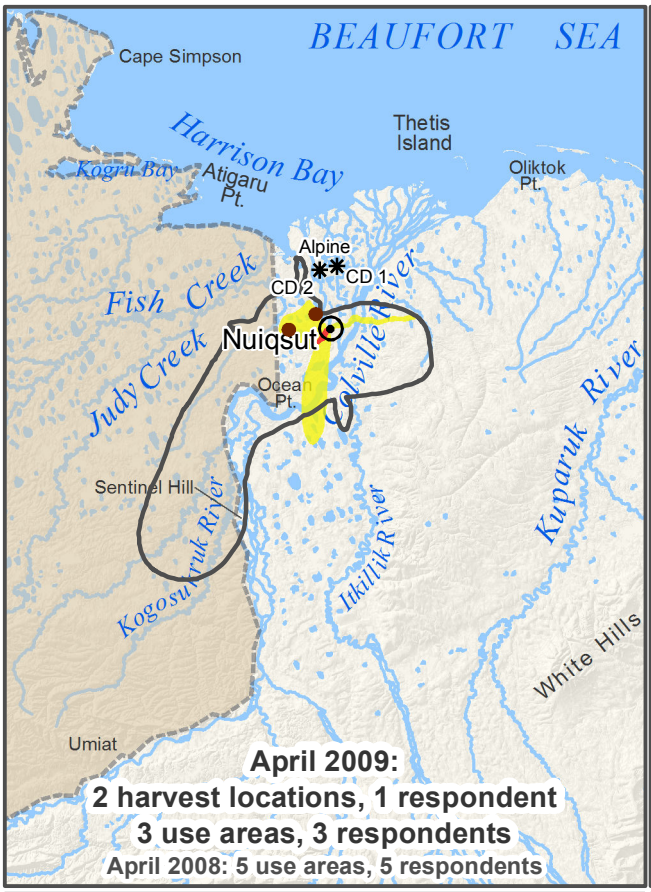
2009 data
High
Overlapping Polygons
Low
Harvest Locations

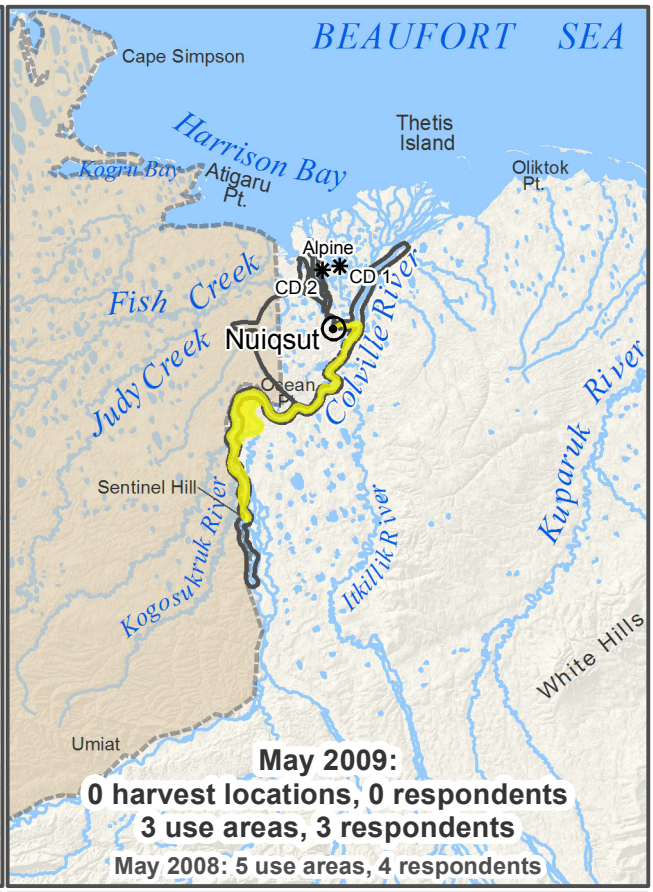
2008 data
Dissolved Polygons

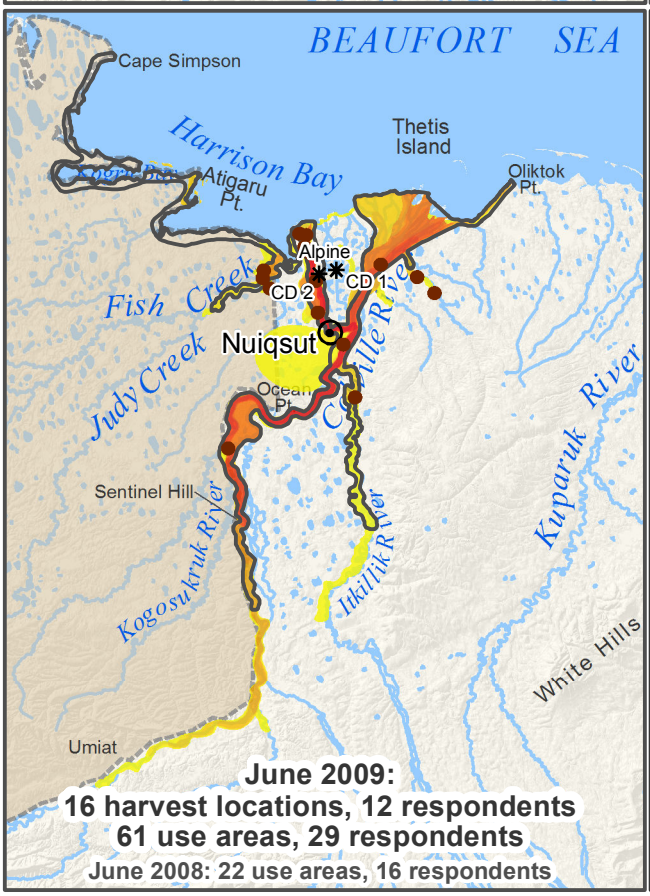
National Petroleum Reserve Alaska

0 5 10 20
Miles

SCALE: 1:1,700,000
Projection: Alaska Albers Equal Area Conic, NAD 1983







Map 11
Caribou Subsistence Use Areas and Harvest Locations April, May and June 2009 with 2008 Use Area Data

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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LEGEND

2009 data

High

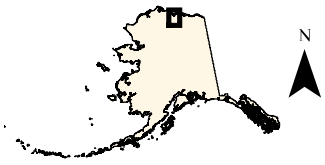
Overlapping Polygons

Low

Harvest Locations

2008 data

Dissolved Polygons



National Petroleum Reserve Alaska

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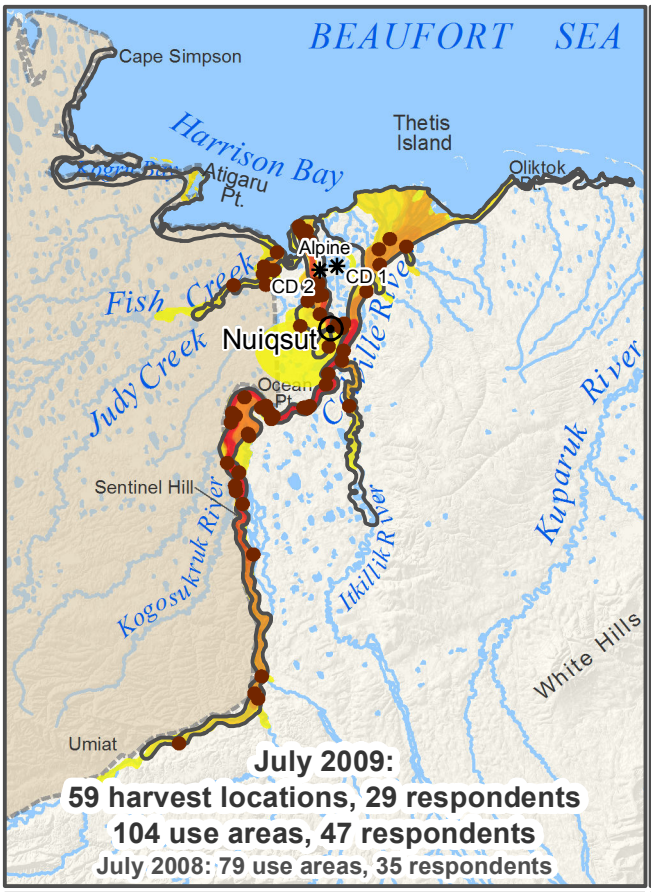
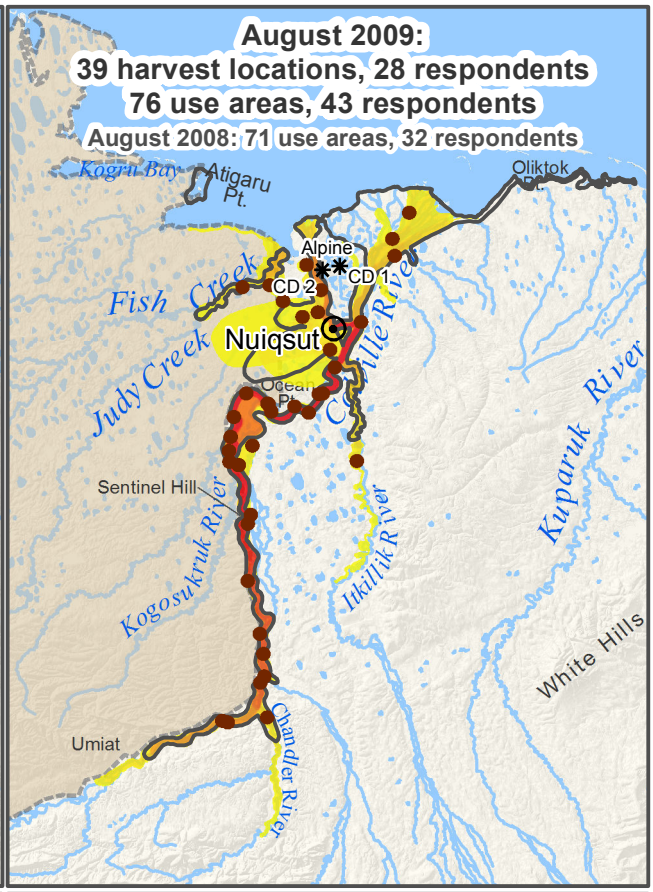
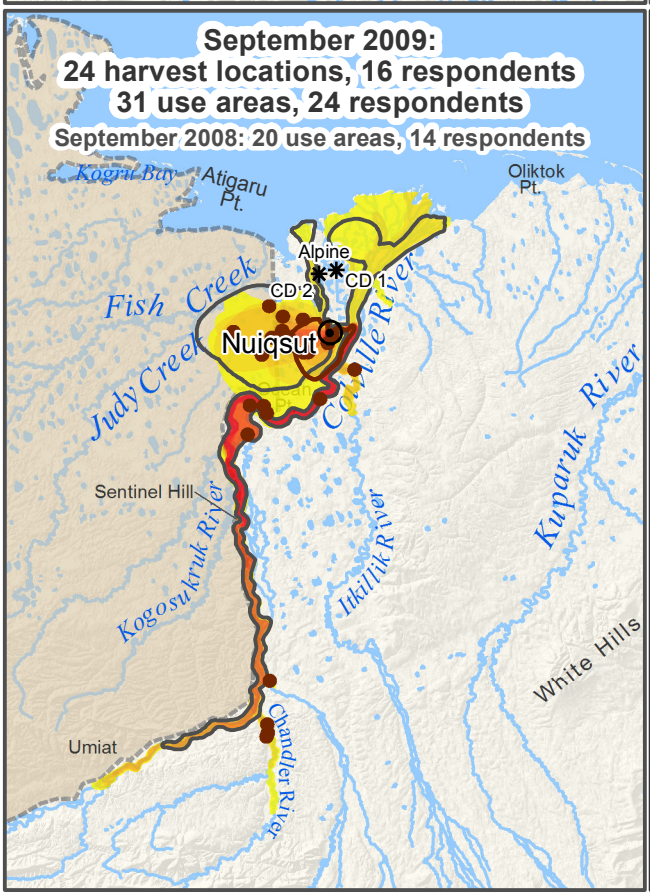
Miles

SCALE: 1:1,700,000

Projection: Alaska Albers Equal Area Conic, NAD 1983







Map 12
Caribou Subsistence Use Areas and Harvest Locations July, August and September 2009 with 2008 Use Area Data

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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LEGEND

2009 data

High

Overlapping Polygons

Low

Harvest Locations

2008 data

Dissolved Polygons

National Petroleum Reserve Alaska

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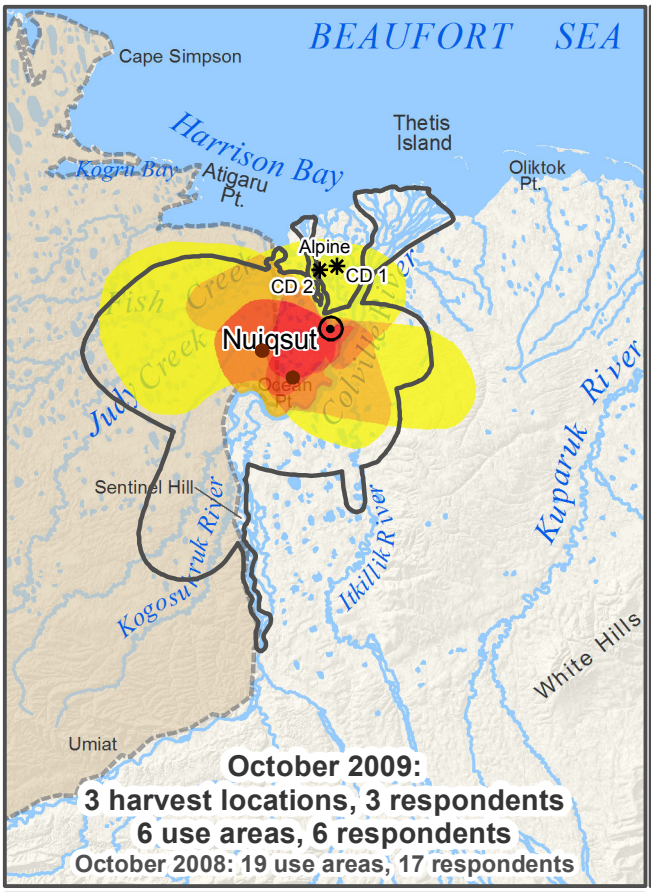
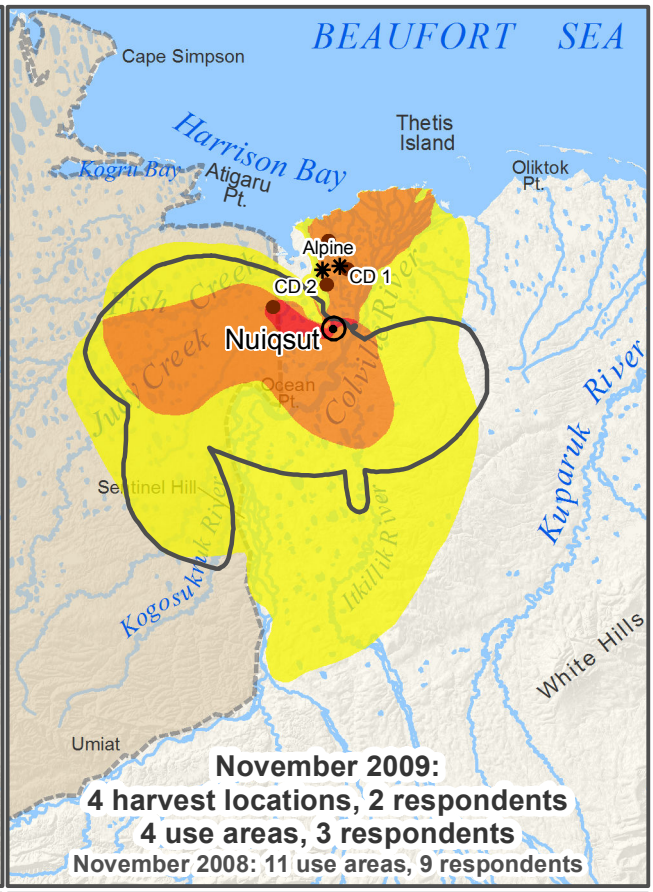
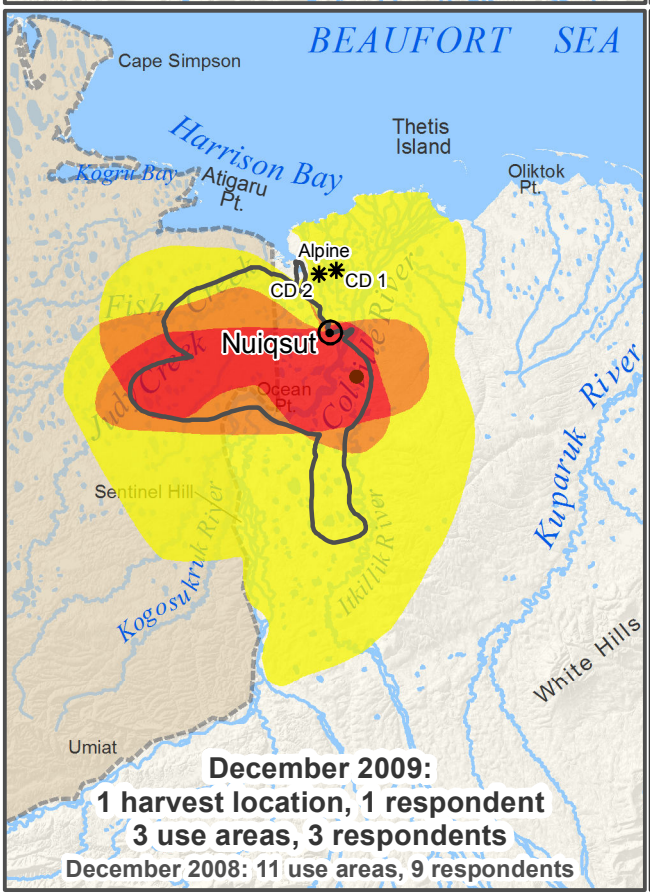
Projection: Alaska Albers Equal Area Conic, NAD 1983







Map 13
Caribou Subsistence Use Areas and Harvest Locations October, November and December 2009 with 2008 Use Area Data

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 54 individuals during April and May of 2010.

Other areas may have been used for resource harvesting.

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LEGEND

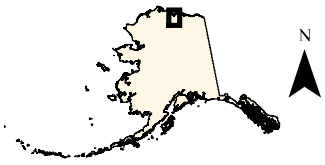
2009 data

High
Overlapping Polygons
Low

Harvest Locations

2008 data

Dissolved Polygons

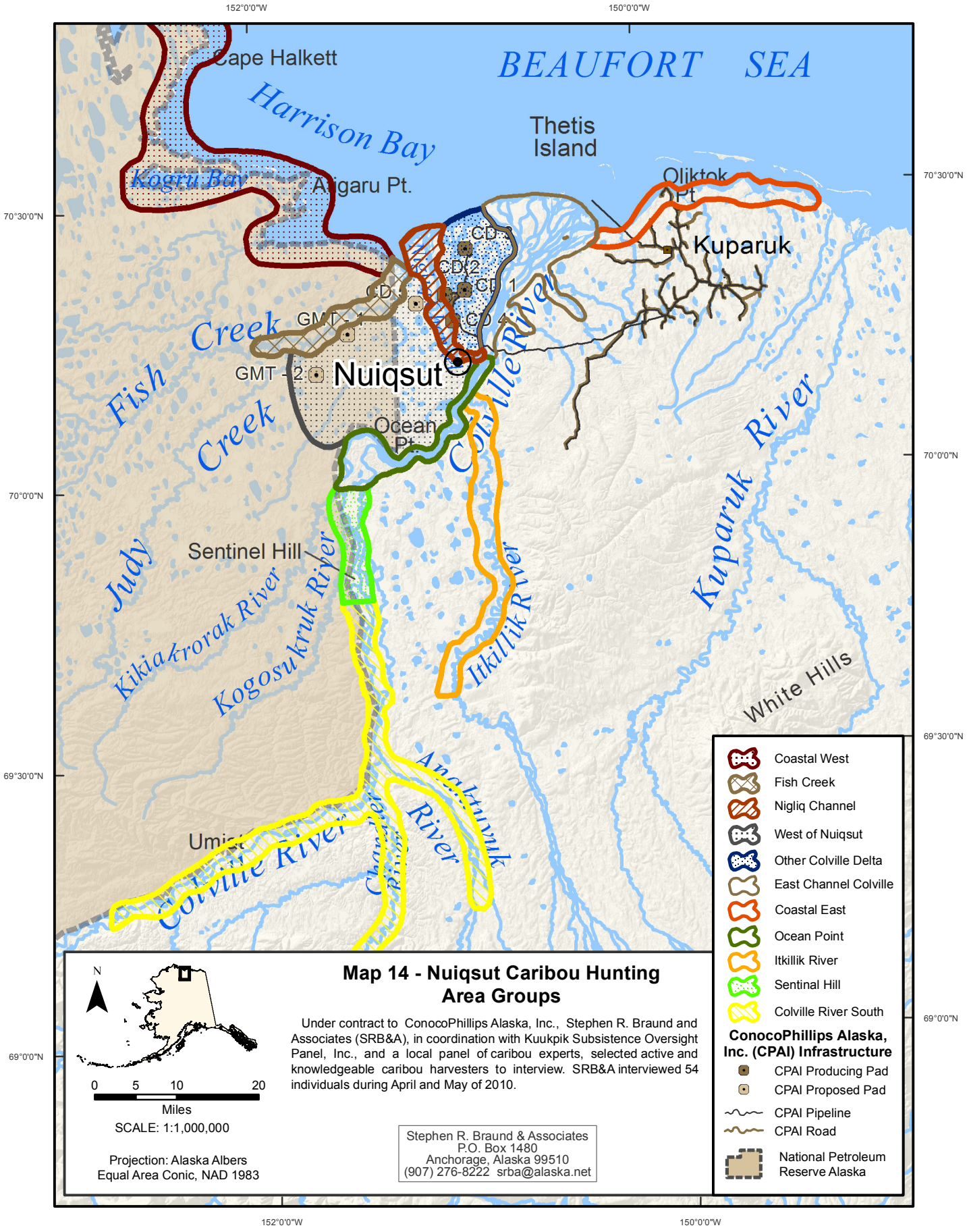


National Petroleum Reserve Alaska

0 5 10 20
Miles

SCALE: 1:1,700,000

Projection: Alaska Albers Equal Area Conic, NAD 1983



Map 14 - 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 54 individuals during April and May of 2010.

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The data suggest that the decline in caribou harvests in 2009 did not occur in a particular area, but was an overall decline, and that residents may have focused more on harvesting caribou during their moose hunting activities in the Chandler River/Umiat area to compensate for low harvests during the summer. This is also supported by the fact that September (the peak of the moose hunting season) accounted for a higher percentage of caribou harvests in 2009 than 2008 (Table 13).

Table 14: Percentage of Caribou Harvest Locations and Caribou Harvests by Caribou Hunting Area

Caribou Hunting Area	Percentage of Caribou Harvest Locations		Percentage of Total Caribou Harvests	
	2008	2009	2008	2009
Nigliq	19%	18%	23%	22%
East Channel Colville R. Delta	8%	8%	8%	8%
Other Colville R. Delta	2%	1%	2%	1%
Fish Creek	8%	7%	7%	7%
Coastal West	1%	0%	1%	0%
Coastal East	3%	0%	3%	0%
Itkillik River	7%	4%	6%	4%
Ocean Point	22%	23%	17%	20%
Sentinel Hill	9%	10%	9%	9%
Chandler River/Umiat	4%	11%	3%	11%
West of Nuiqsut	14%	17%	18%	17%
Other	3%	1%	3%	1%
Total	100%	100%	100%	100%

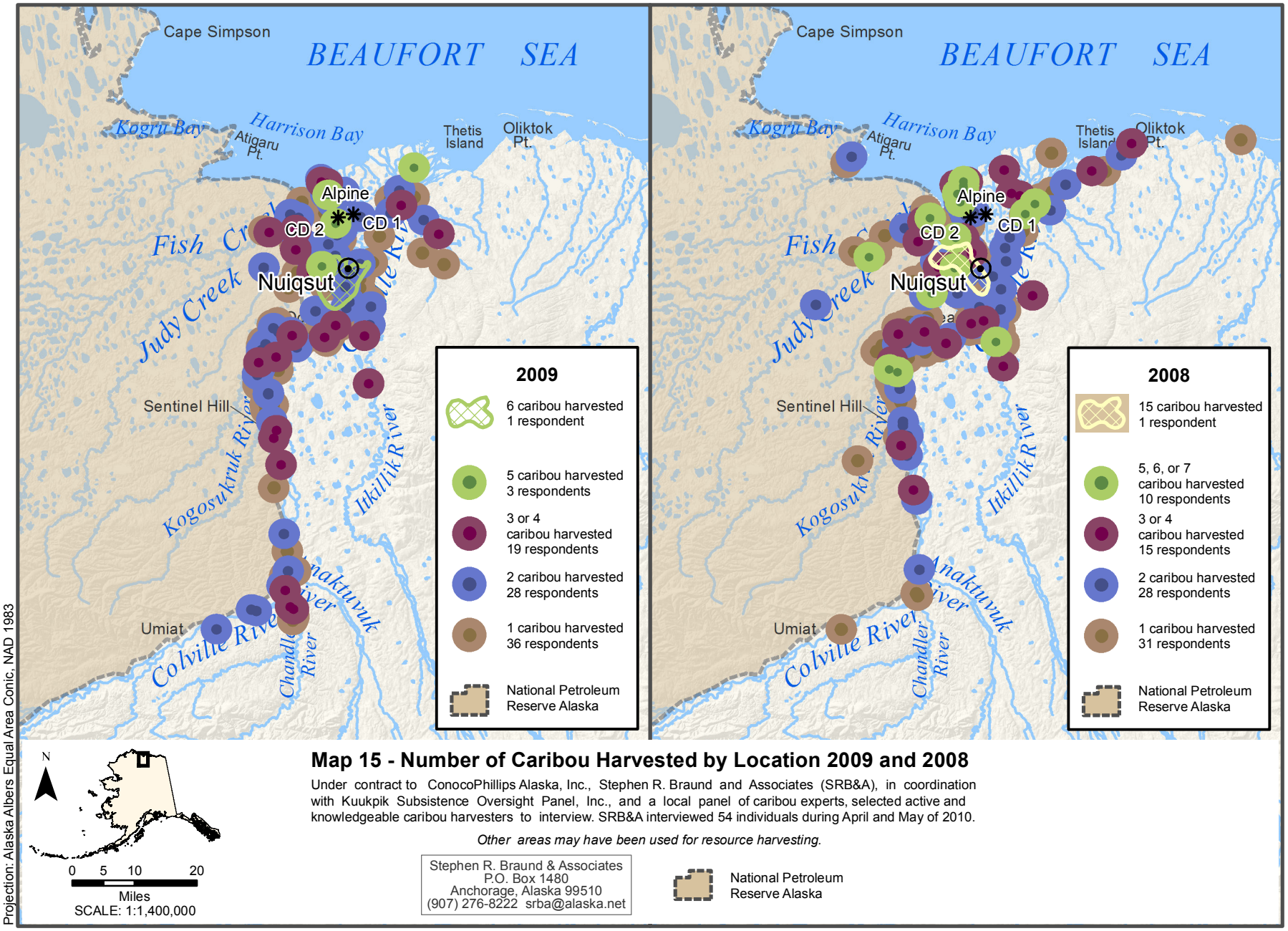
Stephen R. Braund & Associates, 2011.

Data from 2009 indicate that most caribou harvest locations (75 of 152) involved a single kill while harvests of two caribou at the same location accounted for a slightly smaller number of harvest locations (48 versus 75, Table 15). Harvests of more than five caribou occurred at only one harvest location in 2009. Map 15 shows the number of caribou harvested by harvest location in 2009 and 2008. The map suggests that higher numbers of caribou are often harvested closer to the community, whereas harvests that are located farther from the community are generally limited to a smaller number of caribou. Comparison of the 2009 and 2008 data suggests that fewer 2009 harvest locations involved harvests of four or more caribou.

Table 15: Number of Caribou Harvested by Number of Harvest Locations

Number of Caribou Harvested	Number of Harvest Locations
1	75
2	48
3	16
4	8
5	4
6	1
Total Harvest Locations	152

Stephen R. Braund & Associates, 2011.



Map 15 - Number of Caribou Harvested by Location 2009 and 2008

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 54 individuals during April and May of 2010.

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National Petroleum Reserve Alaska

OBSERVATIONS OF CHANGES IN HARVEST PATTERNS

A higher percentage of study participants reported a change in harvest amount and trip frequency in 2009 compared with 2008 (Table 16). In 2009, 90 percent reported a change in harvest amount compared to 77 percent in 2008, and 82 percent reported a change in trip frequency, compared to 51 percent in 2008. This change can also be observed among the subset of respondents interviewed in both 2009 and 2010 (Table 16). Additional changes noted by respondents in 2009 included a change in hunting area (30 percent), and change in hunting months (16 percent). Fifty-six percent of study participants reported that they did not harvest enough caribou in 2009 to meet their needs, up seven percent from the 49 percent reported for 2008 (Table 17). The subset of individuals interviewed in both 2009 and 2010 also showed an increase in the percentage reporting that they did not harvest enough caribou (64 percent up from 55 percent).

Table 16: Percentage of Respondents Reporting Changes in Harvest Activities Compared to Recent Years (2008) and Previous Year (2009)

Changes in Harvest Activities	Percent of Respondents			
			Respondents Interviewed During Both Study Years	
	2008	2009	2008	2009
Harvest Amount	77%	90%	73%	86%
Trip Frequency	51%	82%	50%	82%
Trip Duration	40%	34%	36%	36%
Hunting Area	31%	30%	27%	23%
Hunting Months	20%	16%	14%	18%
Number of Respondents	35	50	22	22

Stephen R. Braund & Associates, 2011.

Table 17: Percentage of Respondents Reporting Not Harvesting Enough Caribou Compared to Recent Years (2008) and Previous Year (2009)

	Percentage of Respondents			
			Respondents Interviewed During Both Study Years	
	2008	2009	2008	2009
Reported Did Not Harvest Enough	49%	56%	55%	64%

Stephen R. Braund & Associates, 2011.

Changes in Harvest Amount

Ninety percent of study participants reported a change in harvest amount in 2009 (Table 16). Thirty-seven of the 45 respondents (82 percent) who observed a change in harvest amount reported a decrease in harvest since 2008 (Table 18). When asked why they had experienced a decrease in harvest amount, respondents most commonly cited resource availability (i.e., the caribou were not available in 2009) or migration changed or diverted; other related causes cited by Nuiqsut respondents included change in food availability, farther from riversides, further from village, and change in distribution/migration. Residents also cited personal reasons in general and more specific personal reasons such as employment/lack of time, change in subsistence dependents, change in subsistence providers, and need more.

Table 18: Reasons for Change in Harvest Amount by Type of Change, Nuiqsut, 2008 and 2009

Why Change in Harvest Amount	Type of Change in Harvest Amount					
	2008			2009		
	Harvest Less	Harvest more	Total	Harvest Less	Harvest more	Total
Resource Availability	8		8	9	2	11
Migration changed or diverted	3		3	5		5
Personal Reasons		2	2	3	2	5
Take more trips		1	1	0	3	3
Employment/Lack of time	1		1	2		2
Change in Food Availability				2		2
Farther from riversides/farther inland				2		2
Change in subsistence dependents	3	1	4	2		2
Airplane Traffic Disturbance	2		2	1		1
Development	2		2	1		1
Pipeline	1		1	1		1
Oil Drilling				1		1
Contamination from air pollution				1		1
Take fewer trips				1		1
Increase in Predators				1		1
Further from Village				1		1
Change in distribution/migration				1		1
Lack of transportation/equipment	2		2	1		1
Change in subsistence providers	1		1	1		1
Need more					1	1
Sport Hunting Methods Disturbing Migration Routes				1		1
Helicopter Traffic Disturbance	4		4			
Air Traffic	1		1			
More difficult	2		2			
Closer to Village		1	1			
Resource in Smaller Groups	1		1			
Travel farther to harvest resource	1		1			
Need less	2		2			
Number of Observations	34	5	39	37	8	45
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.						

Stephen R. Braund & Associates, 2011.

Study participants offered different possible reasons for a decrease in caribou availability. Respondents generally indicated that the caribou had not been present in their usual areas in 2009, resulting in poor harvest success. Several individuals (see discussion under Caribou Use Areas) noted that the caribou were less available during the winter months of 2009. One respondent said,

> *The question is where are all the caribou at this winter? I guess we just can't comment on it, we are just wondering where they are. I want other people to tell us what's going on.* (SRB&A Nuiqsut Interview April 2010)

Other Nuiqsut caribou hunters provided differing explanations for their decreased harvests in 2009, citing pipelines associated with Alpine diverting the caribou, a change in feeding grounds, and sport hunters along the Dalton Highway affecting caribou migration. These individuals said,

> *I didn't really go out much because there was hardly any caribou in 2008 either, I think ever since they put up that Alpine and the pipeline, that's probably the reason why they are never coming over this way.* (SRB&A Nuiqsut Interview May 2010)

> *Maybe they are going to a new grazing ground, because they've been hanging around here for years.* (SRB&A Nuiqsut Interview April 2010)

> *I don't know, that's a good question. I was talking to someone going down to Anchorage, and we run into a bunch of bow hunters, they were thinking maybe that's why they re-routed. Maybe the other hunters are changing their route. Because we have always been taught that if the first ones come through you have to let them go because then there's 1,000 more behind them.* (SRB&A Nuiqsut Interview May 2010)

Changes in Trip Frequency

Eighty-two percent of respondents reported a change in trip frequency in 2009 compared with 51 percent of study participants in 2008 (Table 16). Respondents reported both an increase and a decrease in the number of harvesting trips they took to harvest areas compared to the previous year (Table 19). Lack of transportation was the primary cause attributed to taking fewer trips in 2009. In four cases, residents indicated that resource availability caused them to take fewer trips (e.g., they went hunting less because the caribou were less available), and in seven cases residents indicated that resource availability caused them to take more trips (e.g., they had to go hunting more often to harvest enough caribou because the caribou were less available). The most common reasons for taking fewer trips were personal reasons (e.g., lack of transportation, employment) whereas the most common reasons for taking more trips were resource availability, followed by personal reasons.

A number of hunters indicated that their frequency of trips changed because of increased difficulty finding caribou in 2009. Residents responded to the lack of caribou availability in one of two ways: by increasing their effort to find caribou (e.g., taking more trips), or by taking fewer caribou hunting trips because of the perception that they would not be successful. These individuals described,

> *[I went] MORE. That was more because I was trying to find them, just looking everywhere.* (SRB&A Nuiqsut Interview May 2010)

> *More trips, longer trips. When I travel I always have to bring an extra drum of gas with me. And there are times when I would have to go in Fish Creek and spend a night there hoping to see some inland caribou coming closer.* (SRB&A Nuiqsut Interview May 2010)

> *It was, like, more [frequent trips], because it was hard to look for the caribou and then they were not in the same places [where we usually look for them].* (SRB&A Nuiqsut Interview May 2010)

> *We did a lot of increased activities, it takes more trips to harvest. We made a concentrated effort to save for the subsistence. We could have harvested more but we didn't have enough [time, money] to take more trips. During the times when we could hunt in these areas we are in a lot of competition with the other things that are going on, increased activities with the oil, with the outside hunters….* (SRB&A Nuiqsut Interview April 2010)

[I went] less. There were hardly any caribous last summer. You know, some of the hunters, we always talk about it - which way he go, and which way I go, and how many we see. But some guys [in 2009] always say, "I didn't even see one." (SRB&A Nuiqsut Interview April 2010)

It was kind of less because there was hardly any caribous around our village, mostly I just went down to the ocean for seal hunting. (SRB&A Nuiqsut Interview May 2010)

Less [trips]. No caribous. We hear from other people that they see nothing on the west or south, and so I didn't bother to go because I knew there wouldn't be any. (SRB&A Nuiqsut Interview May 2010)

Table 19: Reasons for Change in Trip Frequency by Type of Change, Nuiqsut, 2008 and 2009

	Type of Change in Frequency of Trips					
	2008			2009		
Why Change in Frequency of Trips	Take fewer trips	Take more trips	Total	Take fewer trips	Take more trips	Total
Resource Availability		4	4	4	7	11
Lack of transportation/equipment	4		4	10		10
Personal Reasons	2		2	2	6	8
Employment/Lack of time	3		3	3		3
Development		2	2		1	1
Traffic Disturbance		1	1		1	1
Need less				1		1
Competition with sport hunters					1	1
Mitigation Funds		1	1			
Pipeline		1	1			
Migration changed or diverted		2	2			
Sharing More		1	1			
Less Snow	1		1			
Number of Observations	13	12	25	23	16	36
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.						

Stephen R. Braund & Associates, 2011.

Several respondents indicated that they took fewer trips in 2009 because they did not have adequate transportation. As two individuals said,

No four-wheeler. I had a four-wheeler a couple years back. I'm hoping to get one this year. Hopefully get out on the boat this year, too. (SRB&A Nuiqsut Interview May 2010)

[I went] less last year, because of the boat I had less. I had to order my part from the lower 48, and it took two months to get here. (SRB&A Nuiqsut Interview May 2010)

Others cited personal reasons such as lack of time due to employment. One respondent said,

Less often. I've been trying to go back to work. It's hard to get back to work after you've been laid off and terminated. Mostly I've been doing a lot of baleen work and arts and crafts. (SRB&A Nuiqsut Interview May 2010)

Changes in Trip Duration

Thirty-four percent of respondents reported a change in trip duration in 2009 compared to 2008 (Table 16). The majority of these individuals reported taking longer trips than the previous year (Table 20). Causes of this change cited by Nuiqsut respondents included a change in resource availability, having to travel farther to find caribou, and caribou being farther inland from the riversides. Residents also cited personal reasons for taking longer trips to hunt caribou.

Table 20: Reasons for Change in Trip Duration by Type of Change, Nuiqsut, 2008 and 2009

	Type of Change in Duration					
	2008			2009		
Why Change in Duration	Take longer trips	Take shorter trips	Total	Take longer trips	Take shorter trips	Total
Resource Availability	4		4	3		3
Personal Reasons		1	1	3		3
Employment/Lack of time		1	1		1	1
Travel farther to harvest resource	1		1	1		1
Farther from riversides/farther inland				1		1
Lack of transportation/equipment					1	1
Increased cost of living/expenses				1		1
Airplane Traffic Disturbance	2		2			0
Helicopter Traffic Disturbance	2		2			0
Development	1		1			0
Migration changed or diverted	5		5			0
More difficult	1		1			0
Number of Observations:	16	2	18	9	2	11
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.						

Stephen R. Braund & Associates, 2011.

Several individuals reported taking longer trips because they had to spend more time to find caribou. Two respondents observed,

> *We stayed a little bit longer; the caribou were concentrated on top of the hills, and we were waiting for them to cross. We had to keep waiting for some of the caribous to cross.* (SRB&A Nuiqsut Interview May 2010)

> *They're starting to be longer. If I made my harvest I wouldn't have to stay longer. I had to stay 10 days at a time at the most.* (SRB&A Nuiqsut Interview May 2010)

One respondent indicated that he stayed out longer, rather than taking multiple shorter trips, in order to save on gas expenses. He said,

> *[I took] longer trips when I looked for caribou. See how expensive the gas is now? You've got to stay out there until you see one. That's pretty much what I did in 2009.* (SRB&A Nuiqsut Interview April 2010)

Others reported taking longer or shorter trips for personal reasons such as lack of transportation, lack of time due to employment, or increased effort due to having more time in 2009. One hunter said, "Shorter

than usual because they were only day trips; I had to come back and work the next day. Like I said, I was working six days a week" (SRB&A Nuiqsut Interview May 2010).

Changes in Use Area

Thirty percent of respondents reported a change in use areas in 2009 (Table 16). No single reason for the change was mentioned more frequently than another (Table 21). In seven cases, residents pointed to caribou distribution or migration related changes (migration changed or diverted, resource availability, farther from village, move to different areas) for causing the change in their use area.

Table 21: Reasons for Change in Use Area by Type of Change, Nuiqsut, 2008 and 2009

	Type of Use Area Change								
	2008				2009				
Number of Observations	Travel farther to harvest resource	Smaller hunting area	Use area changed	Total	Travel farther to harvest resource	Use area changed	Change in timing of hunt	Move to Different Areas	Total
Migration changed or diverted	3		1	4		2			2
Resource Availability			1	1	1	1			2
Lack of transportation/equipment		2		2		1	1		2
Climate affecting travel						2			2
Development			1	1				1	1
Employment/Lack of time		1		1		1			1
Further from Village					1				1
Move to Different Areas						1			1
Change in distribution/migration						1			1
Personal Reasons		1		1		1			1
Increased cost of living/expenses						1			1
Wind						1			1
Traffic Disturbance	1			1					
Helicopter Traffic Disturbance	1			1					
Airplane Traffic Disturbance			1	1					
Pipeline	1			1					
Ice roads	1			1					
Farther from riversides/farther inland	1			1					
Less Snow		1		1					
Number of Observations	8	5	4	17	2	12	1	1	16
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.									

Stephen R. Braund & Associates, 2011

Residents' use areas can be affected by the distribution of resources, residents' ability to travel to their regular use areas due to personal reasons (e.g., lack of transportation, ability to purchase enough gas, time), and environmental reasons (e.g., water levels in rivers, ocean conditions). One respondent indicated that she had wanted to go to Fish Creek to look for caribou in 2009, but the wind was too rough for boat travel in the ocean. She indicated that she has been traveling to Fish Creek less often after seismic activity occurred in her berry picking area:

> *If we don't find caribous around here, we always go to Fish Creek, but last year we never did. Just when we don't see no caribous around here [Nigliq]. We go through there and look around for* tuttu*. But we don't see any. I was trying to let the boys go to Fish Creek to look for more caribous, but too much wind to make it. You have to go to the ocean to get there..… I used to travel a lot more to Fish Creek (use area changed); that's where my salmonberry picking used to be, right here. I never go over there after seismic go through. I don't know if the salmonberries are still growing. The seismic go through there.* (SRB&A Nuiqsut Interview May 2010)

Several other individuals reported that they did not travel to Fish Creek, a usual caribou hunting area, in 2009. One individual explained that he did not have enough time in 2009 to travel there:

> *I never even went to Fish Creek last year, when those caribous go away from the river what I'll do is go somewhere else, some other place. I never even went over to Fish Creek last fall, no time for that.* (SRB&A Nuiqsut Interview April 2010)

Others indicated that their hunting areas changed because the caribou were in different places than usual, with respondents saying,

> *[I went to] different areas, because the migration changed that year. Last year the migration changed because the caribou that came from the west were diverted back up this way. They changed like this. They were supposed to go through there, but there was hardly any though. They went back south.* (SRB&A Nuiqsut Interview May 2010)

> *I got most of mine more south. They change their route actually, they started going from the Colville River to the west side.* (SRB&A Nuiqsut Interview May 2010)

> *I feel like I went further last year than I did the year before, the year before there was a lot of caribou. We saw a whole bunch, you could take your pick, and then last year I didn't hardly see any. When we went out looking for ducks I wasn't expecting to see any caribou but I ended up catching some.* (SRB&A Nuiqsut Interview April 2010)

Several people commented that their general hunting area is the same every year, but that the focus of their activities changes based on the location of the caribou herd:

> *Yeah [all] it's always the same areas, same pattern, but if they are not there then we will have to go further east or further west. There used to be a lot of caribous at Eskimo Island but you don't see that now.* (SRB&A Nuiqsut Interview May 2010)

> *No, [I went to] different places. Like a couple years back they were on this other side, and then up a little ways there would be some on the west side and you would have to stop and look around for the caribou. I don't know why. I can't just tell them to move. Like this year, last year, it's different. They are mostly in the low spot where people can't see them. In the low spots. I keep telling them, go up, because if they're on the other side of the mountain then you can't see them. I tell them to go because they might be on the next mountain over.* (SRB&A Nuiqsut Interview May 2010)

Changes in Hunting Months

Sixteen percent of study participants reported a change in hunting months in 2009 (Table 16). In 2009 reasons given for a change in months harvesting were mostly personal (Table 22). Respondents explained, for example:

> *I was sick last year [in the fall], so those were the only caribous I got [in the summer]. In the fall time, I usually get around 10, 15 while they're fat. That's when they're fat.* (SRB&A Nuiqsut Interview April 2010)

> *I had no snowmachine [so I didn't hunt in the winter].* (SRB&A Nuiqsut Interview April 2010)

One study participant gave a detailed explanation regarding a lack of caribou in June, indicating that heavy air traffic during that month resulted in the caribou not crossing Nigliq Channel at their usual time:

> *It was kind of different last year because they never even go through Nigliq. For some odd reason they got diverted over here when we were expecting them in the area of Nigliq. That was, like the end of June. [There were] planes flying around, flying real low, and I tried to get the numbers off the tail, but I couldn't see the numbers. That was a plane, end of June, first part of July…And then we were over here, and the caribous were in that area and then all of a*

sudden they were diverted. I kind of think that it was that plane. (SRB&A Nuiqsut Interview May 2010)

Table 22: Reasons for Change in Months of Harvest by Type of Change, Nuiqsut, 2008 and 2009

Why Change in Months	Type of Change in Months				
	2008			2009	
	Later hunting season	Change in timing of hunt	Total	Harvest season changed	Total
Resource Availability				2	2
Lack of transportation/equipment	1	1	2	2	2
Personal Reasons				2	2
Airplane Traffic Disturbance				1	1
Change in subsistence dependents				1	1
Employment/Lack of time		2	2		0
Later Migration/Arrival	3		3		0
Number of Observations	4	3	7	8	8
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.					

Stephen R. Braund & Associates, 2011.

Harvested Enough Caribou

Fifty-six percent of respondents reported that they were not able to harvest enough caribou in 2009 (Table 17). Fourteen of the 23 responses (61 percent) given for not harvesting enough caribou concerned resource availability, either stated in general or stated as a change in migration (Table 23). In six cases, residents cited personal reasons for not harvesting enough caribou.

The following are examples of respondent observations regarding not harvesting enough caribou in 2009:

Last year I didn't get any. I only had two day trips [because I was working]; that's about it. (SRB&A Nuiqsut Interview May 2010)

People have been giving us caribou, so that's what we got. We didn't want to go out too far, and the City of Nuiqsut has been giving us limited gas. (SRB&A Nuiqsut Interview May 2010)

Nope. It wasn't enough. Like I said, I got seven less than the year before because of the air traffic that's out there. Like tourists planes, sports fishermen, sport hunters. That chopper, the crazy chopper. (SRB&A Nuiqsut Interview May 2010)

Table 23: Reasons for Not Harvesting Enough Caribou, Nuiqsut, 2008 and 2009

	Number of Respondents	
	2008	2009
Resource Availability	7	12
Migration changed or diverted	5	2
Change in subsistence dependents	3	1
Lack of transportation/equipment	2	
Helicopter Traffic Disturbance	2	
Development	2	
Airplane Traffic Disturbance	1	
Air Traffic	1	
Sharing More		1
Personal Reasons		1
Employment/Lack of time		2
Increased cost of living/expenses		1
Traffic Disturbance		1
Total	23	21
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.		

Stephen R. Braund & Associates, 2011.

OBSERVATIONS OF HARVESTED CARIBOU HEALTH AND CONDITION

The percentage of study participants observing at least one abnormality in harvested caribou changed from 66 percent in 2008 to 38 percent in 2009 (Table 24). However, for respondents interviewed during both study years (Table 25), the percentage dropped from 64 percent in 2008 to 50 percent in 2009; thus, the change in the number of respondents observing abnormalities may be due partly to an altered respondent sample during Year 2 interviews. One North Slope Borough reviewer suggested that the lower number of observations may be due to a slightly younger sample during the Year 2 interviews (a higher percentage were born in the 1980s and 1990s); this individual observed that older hunters may be in a better position to identify abnormalities in caribou.

For the 2008 study year, it was not possible to reconcile whether some caribou were reported more than once for multiple types of abnormalities (e.g., a respondent provided observations of both abnormal size and health for the same caribou) and therefore only ranges for the possible minimum and maximum number of abnormal caribou are provided for that study year. In 2009, all but two records in the database were associated with a unique harvest location, and in the two records where the harvest locations were identical, the respondent acknowledged that the two observations (health and quality) were for the same caribou. Therefore, the study team was able to determine the total number of caribou considered abnormal by respondents. The number of abnormal caribou harvested by Nuiqsut respondents dropped from between 72 and 84 in 2008 to 33 in 2009 (Table 26). Similar decreases can be observed for observations of (smaller) size, parasites, and quality of meat. The types of abnormalities observed with their associated cause (as reported by respondents) are depicted in Table 27. Map 16 shows harvest locations where respondents reported abnormalities in the harvested caribou. This map indicates that abnormal caribou were harvested throughout residents' hunting areas, with the majority occurring north of Ocean Point.

As shown in Table 27, Nuiqsut respondents observed various abnormalities in caribou health, including disease/infection and changes in the texture or smell of the meat. The most common observations regarding abnormal health in caribou included pus-filled growths inside the body, infected joints, and discolored or slimy meat and/or organs.

Table 24: Observations of Abnormalities in Harvested Caribou, Nuiqsut, 2008 and 2009[3]

Changes in Condition of Caribou	2008			2009		
	Number of Respondents	Percent of Respondents	Percent of Observations	Number of Respondents	Percent of Respondents	Percent of Observations
Health	17	49%	49%	15	26%	54%
Size	11	31%	24%	7	13%	25%
Parasites	8	23%	18%	2	4%	7%
Quality	3	9%	7%	2	4%	7%
Other	1	3%	2%	2	4%	7%
One or More Abnormalities	23	66%	100%	20	38%	100%
Number of Respondents /Observations:		35	45		53	28

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Table 25: Observations of Abnormalities in Harvested Caribou, Nuiqsut, 2008 and 2009, Respondents Interviewed in Both Study Years

Changes in Condition of Caribou	2008			2009		
	Number of Respondents	Percent of Respondents	Percent of Observations	Number of Respondents	Percent of Respondents	Percent of Observations
Health	13	59%	57%	9	41%	53%
Size	4	18%	17%	5	23%	29%
Parasites	5	23%	22%	2	9%	12%
Quality	1	5%	4%	0	0%	0%
Other	0	0%	0%	1	5%	6%
One or More Abnormalities	14	64%	100%	11	50%	100%
Number of Respondents/ Observations:		22	23		22	17

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Table 26: Number of Abnormal Caribou by Type of Abnormality, Nuiqsut, 2008 and 2009

Study Year	Number of Abnormal Caribou by Type of Abnormality					
	Health	Size	Parasites	Quality	Other	Total*
2008	25	42	13	3	1	72-84
2009	16	9	5	2	2	33

*Notes: In 2008, respondents may have reported more than one abnormality for an individual caribou; the study team was unable to reconcile the total number of caribou because in several cases, multiple observations were associated with one harvest location and it was unclear whether those multiple observations were for the same caribou or for different caribou harvested at the same location. Therefore, the total column for 2008 provides a range of the minimum and maximum number of caribou identified as abnormal. In 2009, because each observation was associated with a separate feature code, the study team was able to determine the total number of abnormal caribou reported by respondents.

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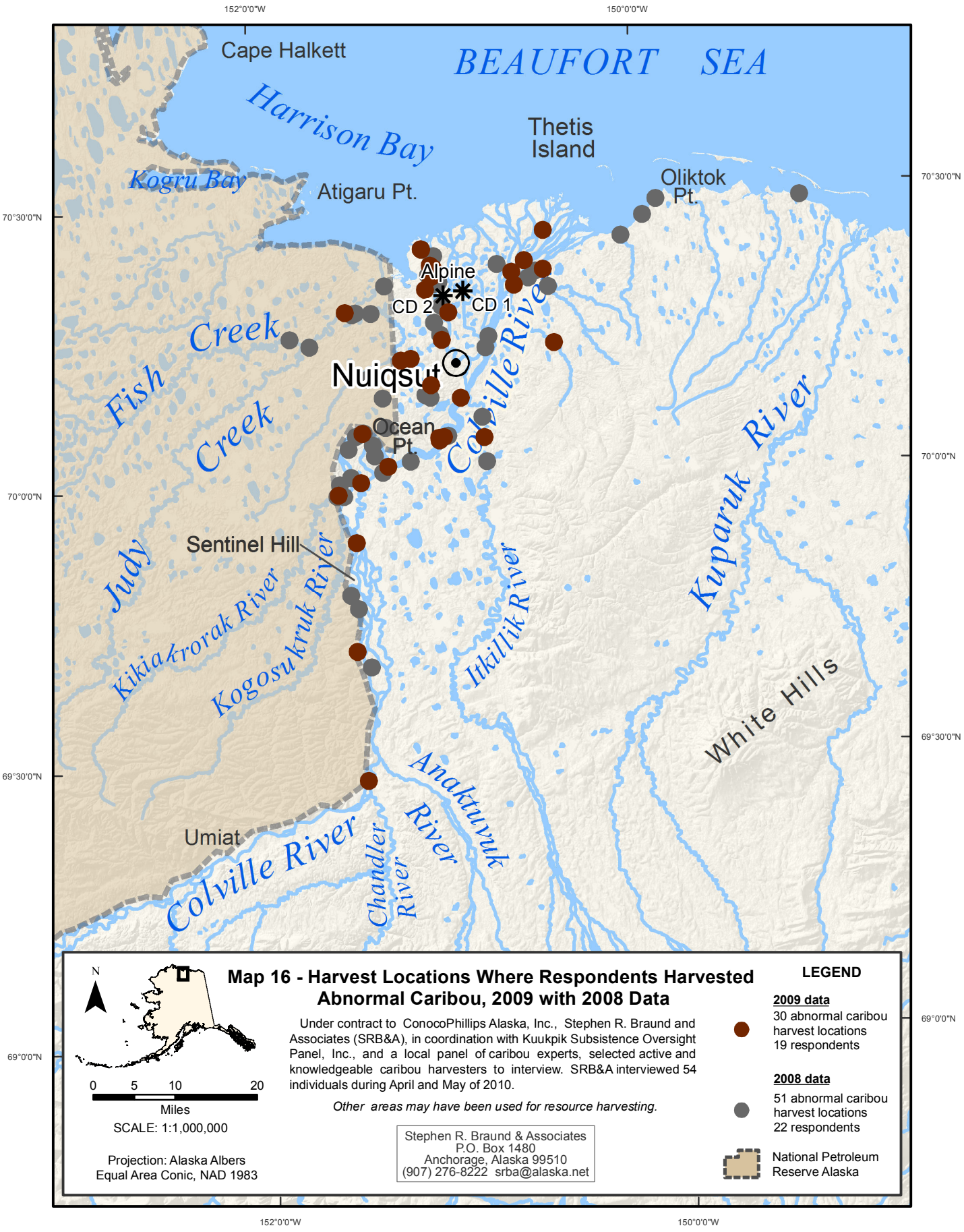
[3] These observations likely include instances of Brucellosis, a common disease in the Teshekpuk and Central Arctic Herd that is characterized by pus-filled swellings and swollen joints.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69°30'0"N
69°0'0"N
Cape Halkett
BEAUFORT SEA
Harrison Bay
Thetis Island
Kogru Bay
Atigaru Pt.
Oliktok Pt.
Alpine
CD 2
CD 1
Nuiqsut
Fish Creek
Judy Creek
Ocean Pt.
Colville River
Kuparuk River
Sentinel Hill
Kikiakrorak River
Kogosukruk River
Itkillik River
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Map 16 - Harvest Locations Where Respondents Harvested Abnormal Caribou, 2009 with 2008 Data
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 54 individuals during April and May of 2010.
Other areas may have been used for resource harvesting.
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LEGEND
2009 data
30 abnormal caribou harvest locations
19 respondents
2008 data
51 abnormal caribou harvest locations
22 respondents
National Petroleum Reserve Alaska

Table 27: Perceived Reasons for Abnormality by Type of Abnormality, Nuiqsut, 2009

Number of Observations by Perceived Reason	Number of Observations by Type								
	Disease / Infection	Decrease in Resource Size	Change in Texture of Meat	New Species in Region	Physical Abnormality	Parasites	Change in Smell of Meat	More Parasites	Total
Natural causes		2				1			3
Resource Injury	3								3
Resource in Smaller Groups		1						1	2
Contamination	1		1						2
Contamination from air pollution	2								2
Wildfires				1					1
Airplane Traffic Disturbance		1							1
Predators	1								1
Parasites					1				1
Reindeer			1						1
I Do not Know	4	2	1				1		8
Total Observations	9	5	3	1	1	1	1	1	22
Note: See Appendix D for a full list of codes and a description of the types of observations each code reflects.									

Stephen R. Braund & Associates, 2011.

Residents provided the following detailed descriptions regarding abnormalities in caribou health in 2009:

> *My hunt was successful, but my caribou was sick. Right around the lakes, yeah, right around the lakes – right at the lake is where I got the caribou. It was the only loner, so I got it. I shot it from the cabins and then walked. Then I realized it was pussed out, it had puss all over the lungs. I left it; I decided to chop the head off and left it. It was a male caribou. Mid-August. I stopped looking around that area [due to the sick caribou].* (SRB&A Nuiqsut Interview May 2010)

> *That [caribou on Colville River] was a male. I think that was the beginning of August [on the Colville River], at the same time we were looking for moose. That was a male. That one was kind of yellowish on the stomach, the sac of the stomach. And there was some kind of brown – it almost looked like a leach, but it wasn't a leach. Like a small tiny liver, it looked like, stuck to the side of the stomach. I brought it home to show it to my dad, and he said it was no good, so we threw it away. I didn't want to take my chances.* (SRB&A Nuiqsut Interview May 2010)

> *I know that I got, like, five of them at Nigliq. They were crossing the river and so I got them in the water. It was between the cabin and Tukle's. It was right by that lake here. We had gotten five that day, one of them had a big tumor, the size of my fist. It was the fifth one. I just took the antlers because they were, like, so big. Where that tumor was, we could see this tumor hanging out, and all around that it was, like hollow, like the tumor ate it up.* (SRB&A Nuiqsut Interview May 2010)

> *At Ocean Point, I make that turn [around the bend] and see the caribou on top [of the cliff], and it was not on the bottom, but it fell down [the cliff] because it was so sick, and I went over to it and I went up to it and the skin [had something wrong with it]; like it was losing hair, like it had the skin showing and some bald spots, and I show[ed] that to my younger brother and he said that someone didn't shoot that caribou, it was sick. And so we talk to [village resident] about that. And a couple people went out and then other people saw that too. Sick one, I left it there. I told*

> *[resident] so he could investigate himself. This caribou must have been sick; some caribous can't see good when they are sick. It must have stepped off the wrong side [of the cliff.]* (SRB&A Nuiqsut Interview May 2010)

> *I noticed that one of them, I don't know if it was a reindeer or a caribou because the meat was kind of white, the way that I was looking at it, it was kind of discolored, should have been real red. And the caribou that my son got was more redder than what my caribou was like. It was more redder. And when I was cutting it up I found some bubble of white puss, and I said that the caribou didn't look too good, and we weren't for sure that it might be a reindeer, because the reindeer has short legs, and this one had short legs. And I didn't want to chance it, so I had to just throw it out. It looked good, and then when I started cutting in the meat, I found that white puss and I said, wait a second, this don't look good. So I just had to get rid of that, I didn't give it to the dogs, nothing. I had started cooking it until I got to the meaty part, and that's when I noticed that. It was so strange.* (SRB&A Nuiqsut Interview May 2010)

> *That one caribou I got right there, the meat was really greenish. I brought it home, and finished cleaning it and taking care of it. I brought a piece to my dad, because the meat looked discolored. He looked at it and he said "don't eat it, this meat is green." He thought it might have some kind of sickness. It was a female. When I went up to it, it really didn't run anywhere. It didn't startle it – I went up real close with my four-wheeler. That was the first time I ever see the green meat on the shoulders.* (SRB&A Nuiqsut Interview May 2010)

Researchers asked Nuiqsut respondents to provide their views on the causes of abnormal health in caribou. Several hunters believed that contamination from oil and gas activities had caused the abnormalities that they had observed, saying,

> *Contaminants, I think that the vegetations might be contaminated, like from years ago, or from the east, all the contaminants coming out of that place [Prudhoe Bay]. You see some with deformed antlers.* (SRB&A Nuiqsut Interview May 2010)

> *The caribou on the west side of the village, some are okay on the ocean side but the ones closer, the one I got was a sick [one.] I decided to not even bother to hunt [that type of] caribou because they're loners, and the loners are the ones who hang around [the developed areas]…they're protecting themselves from the bears and wolves and they're using the pipeline as coverage. They can get close to the Alpine or the village, and the wolves won't. They have peace away from the other carnivores. They're picking up air quality damages or something. For us, when we ingest something wrong, we get heartburn or hiccups. I think they do that to, they get the same thing but it stays in them like cigarettes.* (SRB&A Nuiqsut Interview May 2010)

Others had seen infected wounds they believed were caused by predator attacks; one individual observed, "I think it might have got mauled by something. It got a deformed antler. Probably it was wolverines, wolves" (SRB&A Nuiqsut Interview May 2010). Several individuals indicated that they did not know what had caused the abnormalities, with one hunter noting that he had never observed a caribou with discolored meat before. He said,

> *I couldn't tell you; I've never seen anything like that before. I had to go show my father the meat. He said don't eat that, there's something wrong with that. That was the first time. I've never seen any meat that was green. It was kind of strange. All my life we've been hunting caribou up and down here.* (SRB&A Nuiqsut Interview May 2010)

One hunter had harvested what he thought was a sick caribou because the meat looked discolored and had white spots in it; however, community residents told him that he had probably harvested a reindeer, whose meat looks different from regular caribou. He explained,

> *Those little marbles in it were fat just forming. The meat is sort of kind of a greenish color because of the forming of the fat. So, I didn't get sick from it. The meat looks weird because of the*

> *fat forming. I was thinking that was a reindeer. Yeah, because I asked some of the local people here, and they said, yeah, they [reindeer] have the marbles forming in the fat.* (SRB&A Nuiqsut Interview May 2010)

In addition to observations about caribou health, several individuals reported harvesting smaller than usual or skinny caribou, with one respondent saying, "I can't even make any Eskimo ice cream anymore – not enough fat!" (SRB&A Nuiqsut Interview April 2010). During the May 3, 2011 panel review meeting, one panel member stressed that, in addition to the quantity of caribou available to hunters, the quality of harvested caribou is also extremely important. This individual noted that the caribou have been dispersed into smaller groups, which results in the caribou being skinnier and less healthy. He observed that when caribou are in large herds, they rotate places between the outside and the inside of the herd for insect relief. When they are dispersed into smaller herds, they have fewer opportunities to rest and are therefore skinnier. Iñupiat rely on caribou fat and skinny caribou are considered to be of lesser nutritional quality.

One individual reported that all of the caribou he harvested had seemed skinny in 2009, and attributed this to caribou being scattered in smaller groups and disturbed by air traffic related to Alpine:

> *But the caribou I got last year were hardly any fat. They were pretty skinny. That was the only caribou we saw out there that skinny one, there was a lot of plane activity flying around there, you could see it every day back and forth to Alpine. Maybe because they are sparse, like when they are in herds some are in the middle and some are on the outside and they are able to be healthier, but then when they are alone, and when I am out there I see a lot of plane activity out there while I'm cutting my caribou, because I don't take them home, I cut them out there. So I see all the planes out there.* (SRB&A Nuiqsut Interview May 2010)

Others believed the caribou they harvested were skinny because of the time of year they had harvested them (e.g., early in the summer when the caribou had not had time to build up their fat reserves).

Respondents were asked if they used any of the abnormal caribou they had harvested (Table 28). As the table shows, in most instances (12 of 15 in 2009 and 19 of 22 in 2008) residents did not use the caribou if the abnormality was related to the health of the caribou (e.g., discolored meat or pus). On the other hand, respondents utilized most of the caribou that were abnormal in regards to size, parasites, or quality. During the 2008 study year, respondents indicated that they did not use between 22 and 28 of the caribou harvested (between six and eight percent of the total harvest). During the 2009 study year, respondents indicated that they did not use 13 of the caribou they harvested (five percent of the total harvest).

Table 28: Did Respondent Use Abnormal Caribou? Nuiqsut, 2008 and 2009

	Number of Abnormal Caribou Harvested by Type of Abnormality					
	Health	Size	Parasites	Quality	Other	Total*
2008						
Used	4	39	11	2	0	49-56
Did not use	21	3	2	1	1	22-28
Total	25	42	13	3	1	71-84
Total Number of Reported Caribou Harvests, 2008						368
2009						
Used	4	8	5	1	2	20
Did not use	12	1	0	1	0	13
Total	16	7	5	2	2	33
Total Number of Reported Caribou Harvests, 2009						277
*Notes: In 2008, respondents may have reported more than one abnormality for an individual caribou; the study team was unable to reconcile the total number of caribou because in several cases, multiple observations were associated with one						

harvest location and it was unclear whether those multiple observations were for the same caribou or for different caribou harvested at the same location. Therefore, the total column for 2008 provides a range of the minimum and maximum number of caribou identified as abnormal. In 2009, because each observation was associated with a separate feature code, the study team was able to determine the total number of abnormal caribou reported by respondents.

Stephen R. Braund & Associates, 2011.

IMPACTS ON HARVESTING ACTIVITIES

Helicopter traffic constituted the most commonly reported impact on harvest activities in 2009. Forty-nine percent of study participants in 2009 experienced helicopter traffic-related impacts compared with 71 percent of study participants in 2008 (Table 29). Respondents reported that man-made structures and plane traffic affected 34 percent and 38 percent of respondents in 2009, respectively. Combined, helicopter and plane traffic accounted for 50 percent of all observations regarding impacts on caribou hunting in 2009. The higher percentage of study participants reporting impacts in 2008 may be due in part to researchers allowing Year 1 respondents to describe impacts that had occurred since the Alpine development had begun (see "Active Harvester Interviews" in the Methods section). During Year 2, researchers documented only impacts that had occurred in 2009.

Table 29: Respondent Reported Impacts on Caribou Hunting, Nuiqsut, 2008 and 2009

	Percentage of Respondents		Percentage of Observations	
	2008	2009	2008	2009
Helicopter traffic	71%	49%	20%	28%
Man-made structures	69%	34%	31%	19%
Plane traffic	54%	38%	24%	22%
Other traffic	29%	19%	13%	11%
Regulations	17%	11%	9%	6%
Oil company personnel	6%	0%	4%	0%
Seismic lines or activity	--	13%	0%	8%
Other	14%	6%	0%	3%
Total	86%	74%	100%	100%
Number of Respondents/Observations	35	53	55	92

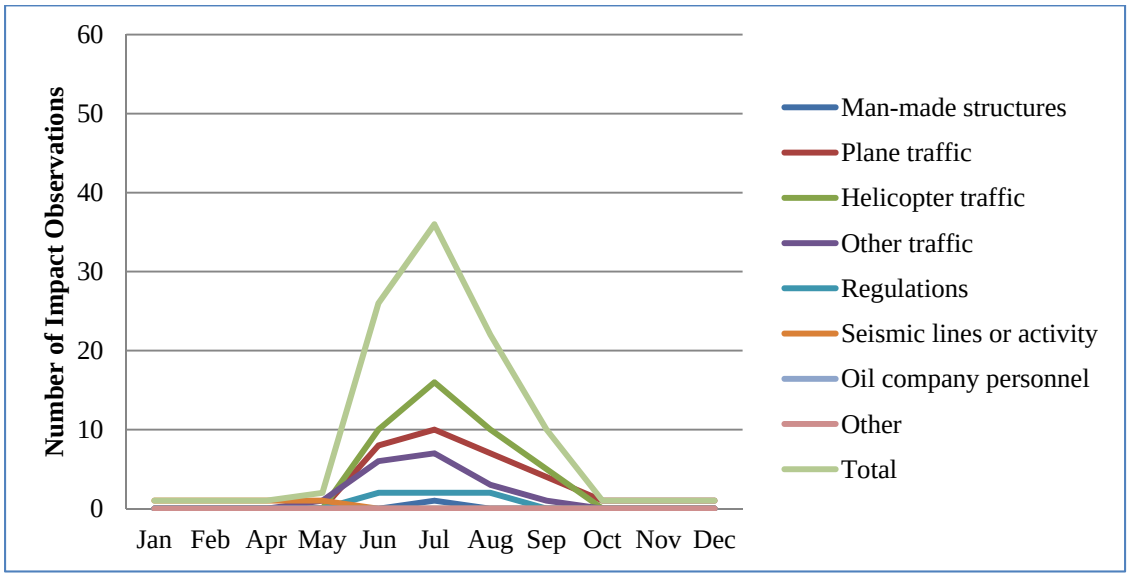
Note: This table includes only cued observations from 2008, because all observations were cued in 2009. In 2008, the study team asked respondents to volunteer whether they had experienced any impacts on caribou hunting before cueing them with specific types of impacts. In 2009, the study team focused the question to ask only about impacts that may have potentially occurred resulting from the Alpine development.

Stephen R. Braund & Associates, 2011.

The monthly pattern of impacts is consistent over the two observation years (2008 and 2009) and is primarily concentrated in the months of June, July, August, and September, when residents conduct the majority of their caribou hunting activities (Figures 3 and 4). The locations of potentially Alpine-related impacts are depicted on Map 17 and shown a particularly high number of impact observations north of Nuiqsut at a specific location on Nigliq Channel. The high instance of observations in this location may be due to its proximity to a common summer camping area where residents set nets for fish and wait for caribou herds to cross the river. Residents were not able to identify the exact location of impacts in all cases.

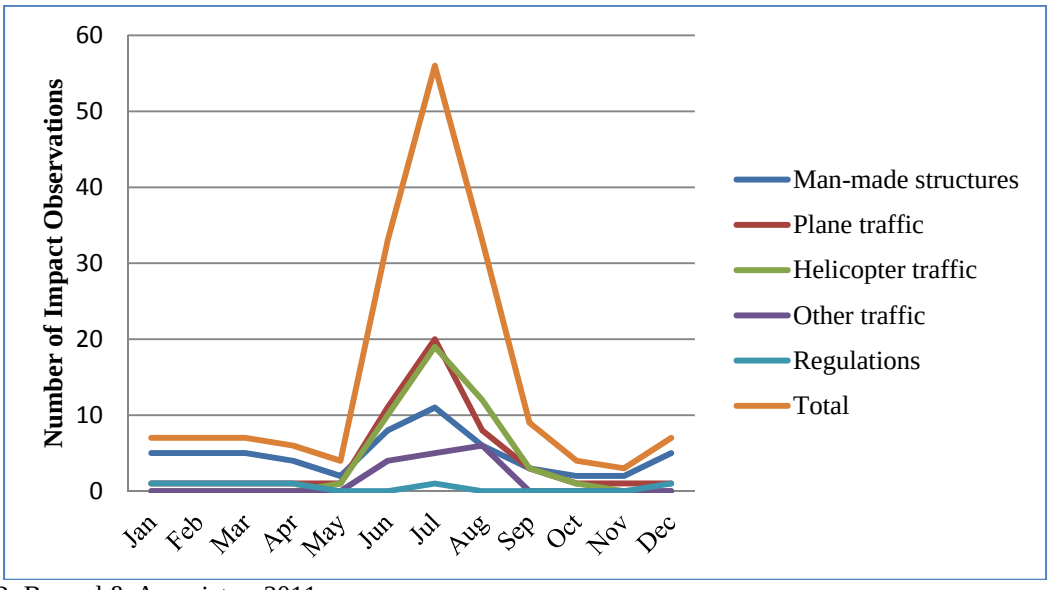
CPAI reviewers questioned whether all of the reported aircraft impacts were related to Alpine activities. They also noted that CPAI did not conduct any seismic activity in 2009, despite reports of seismic activity impacts on Map 17.

Figure 3: Impacts on Caribou Harvest Activities by Type and Month: 2009

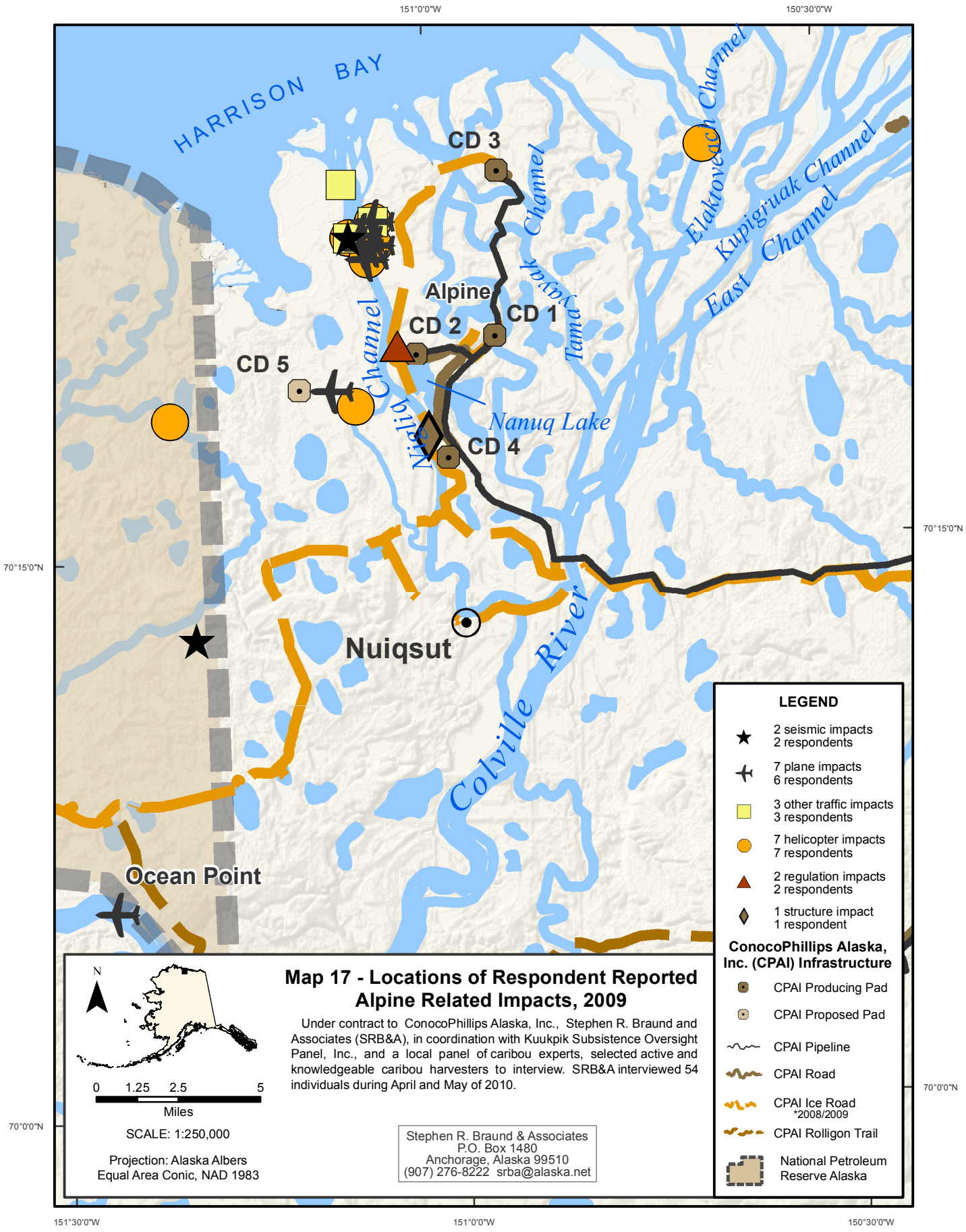


Stephen R. Braund & Associates, 2011.

Figure 4: Impacts on Caribou Harvest Activities by Type and Month: 2008



Stephen R. Braund & Associates, 2011.



Map 17 - Locations of Respondent Reported Alpine Related Impacts, 2009

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 54 individuals during April and May of 2010.

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Impacts of Helicopter Traffic

Forty-nine percent of 2009 hunters observed impacts from helicopter traffic in 2009 compared with 71 percent in 2008 (Table 29). These respondents also identified the locations of helicopter impacts, which are depicted on Map 17. Helicopter impacts occurred primarily along Nigliq Channel between CD2 and CD3. Additional helicopter impacts were reported near Fish Creek and on Elaktoveach Channel. As discussed above, the higher percentage of respondents reporting impacts in 2008 may be due in part to researchers allowing Year 1 respondents to describe impacts that had occurred since the Alpine development had begun, whereas during Year 2, researchers documented only impacts that had occurred in 2009.

Given the number of developments near Nuiqsut it was sometimes difficult for study participants to specifically identify helicopter traffic directly associated with Alpine versus other developments; researchers asked respondents to describe physical characteristics of helicopter and airplane traffic causing impacts as closely as possible. Below are the descriptors assigned by the study team based on residents' descriptions in 2008 and 2009 (Table 30). In some cases residents' observations fell under multiple descriptor categories (e.g., "blue and white Alpine helicopter"). Helicopters with white and blue paint were most commonly mentioned. Several individuals reported helicopters in the Umiat area, which they believe had traveled from Alpine. Other respondents reported helicopters they believed to be associated with Alpine, or which were seen in the Alpine area.

Table 30: Respondent Descriptions of Helicopters Associated with Impacts, Nuiqsut, 2008 and 2009

Respondent Impact Source Descriptor	Number of Times Mentioned 2008	Number of Times Mentioned 2009
Blue and White Helicopter	15	7
Blue Helicopter	0	1
Alpine Helicopter	9	4
Air Logistics Helicopter	2	0
Helicopter Used for Wildlife and Other Studies	2	0
Conoco Phillips Helicopter	2	1
Silver and Black Helicopter	0	1
Black Helicopter	1	0
Red Helicopter	1	1
Umiat Area Helicopter	0	3
Bureau of Land Management (BLM) Helicopter	1	1
Other Agencies Helicopter	1	1
Helicopters - Unknown Owner	1	3
Number of Respondents	**26**	**26**

Notes: Impact source descriptors were created based on the verbatim responses provided by respondents. The study team attempted to obtain as much detail as possible regarding the physical attributes of impact sources in order to distinguish between those impacts that could possibly have been related to Alpine, and those that were likely not related to Alpine.

Stephen R. Braund & Associates, 2011.

Residents most commonly reported experiencing impacts of helicopter traffic while hunting along Nigliq Channel. A number of respondents believed that the helicopter traffic was related to increased activity

around CD5 and the proposed GMT-1 and GMT-2 sites. Impacts related to non-Alpine related activities (e.g., surveying near Umiat, sport hunting) are not discussed in further detail, unless the activity was believed to have originated from the Alpine area. Nuiqsut respondents provided the following description of impacts to their caribou hunting related to helicopters in 2009:

> *There was that time when [a helicopter] landed by the island when we were out there; that was disruptive to us. I would say it was blue and white, there were two helicopters. I don't know who it was related to, it could be any [one of a number of development activities].* (SRB&A Nuiqsut Interview April 2010)

> *Right here, every time when we are at our fish camp, there is so much traffic back and forth every day. This area right here [pointing on the map], and the studies they are doing around CD5, 6, and 7, that's where all the impacts were happening [in 2009]. Right here, when the main herd was coming, they fly low, and then they spook the caribou up this way. Helicopters and planes.* (SRB&A Nuiqsut Interview May 2010)

> *That CD 5 and 6, that's going to divert my caribou farther south. [During] some winters there's too much air traffic and hardly any caribous come from the west. It's not like back in the old days before the Alpine was there, before the air traffic was there. Yeah, we were camping out and the activities, the caribous used to come over here [from Teshukpuk towards Nuiqsut] They never could come over this year. Mostly with choppers, and airplanes, and the flights to Alpine, that really affects the noise problem. [It affects me] when I'm up there in the summer. [And the] regular plane to Alpine.* (SRB&A Nuiqsut Interview April 2010)

> *[Helicopters and planes flying toward Fish Creek to study caribou], and that's the second season that they did that. It's the same both years. It's right after the river breaks up, like end of June, July. It was as Cessna 185, and then there are a couple helicopters that belong to Conoco, blue and white, both of them are blue and white. It's by [resident's] cabin [on Fish Creek]. [The impact] happens when there is a herd coming in, then they start taking off and going back west. And it's the same thing on the east side; the caribous on the east side haven't come across the Colville.* (SRB&A Nuiqsut Interview May 2010)

> *That was all around from June until July all around the [Alpine] area, and then when we do our trips down Colville they just fly right over there too; on Colville. They're going to their rigs down there.* (SRB&A Nuiqsut Interview May 2010)

> *Every time we go down there in June, they always start flying already [until fall time]. Last summer, we get like just caribous went by [one time], but they never come back. We never saw caribous again, except the smaller ones by the river, with the calves. We don't kill those small ones in summertime. They always go by, land somewhere around there by Fish Creek, they're always landing around there, and then take off and go back [toward Alpine].* (SRB&A Nuiqsut Interview May 2010)

> *At one time, it was a chopper [that affected me] last year. Somewhere in this channel, over here [pointing on the map]. We were trying to get close to a couple of caribou. I don't know what the chopper was doing, or where it was going. It spooked the caribou, but it wasn't intentional. The chopper wasn't flying their [normal route]. That was in July. [The helicopter] was white, mostly white and a little light blue.* (SRB&A Nuiqsut Interview April 2010)

> *And then there was a helicopter that was traveling back and forth, it might have been cleaning up the ice road, and that was in July I believe. It makes a lot of hunters pretty mad. I think it was Blue, it was Alaska…. I forget the company's name. Conoco Phillips [sub-contractor]. We made calls on that one.* (SRB&A Nuiqsut Interview May 2010)

Several individuals provided suggestions for how CPAI could mitigate impacts of helicopter traffic on caribou hunting. Their suggestions included limiting the frequency of transporting employees to and from work sites, avoiding helicopter traffic during the peak of the caribou hunting season (July), fly at higher elevations, waiting until the first big caribou herd crosses the Colville River delta before starting helicopter activities, staging helicopter activities out of Nuiqsut where residents are not hunting, and building a bridge across Nigliq Channel so that CPAI does not have to rely as heavily on helicopters for transportation:

> *I always try to talk about how they could help this. They should not bring employees in and out every two weeks, we tried not to have that area become staging; they could have done that in the village because we aren't hunting in the village. They should be doing all their activities in town because then there is the one activity center [rather than spread out the activities.] And also [we would like them to] not concentrate their activities in the subsistence hunt time; like they could transport more in the winter time not during the July time.* (SRB&A Nuiqsut Interview May 2010)

> *Less flying, higher elevation when the main caribou herd that is traveling through, stop bothering them until the first ones come through here first. And their methods of counting the caribou need to change. On the main herd, start counting them section by section.* (SRB&A Nuiqsut Interview May 2010)

> *They could fly higher and then go around, not follow the river at all. That's how the planes usually do it, there's a way that the planes go that the helicopter could go too.* (SRB&A Nuiqsut Interview May 2010)

> *I want them to build that bridge, Nuiqsut bridge, [to] the CDs. Then there would be a lot less plane traffic to get over there. In the future that's the plan [development on the west side]*. (SRB&A Nuiqsut Interview May 2010)

Impacts of Man-made Structures

Thirty-four percent of Nuiqsut respondents reported impacts related to man-made structures in 2009 compared to 69 percent in 2008 (Table 29). As discussed above, the higher percentage of study participants reporting impacts in 2008 may be due in part to researchers allowing Year 1 respondents to describe impacts that had occurred since the Alpine development had begun, whereas during Year 2, researchers documented only impacts that had occurred in 2009. Similar to 2008, pipeline-related impacts were the primary observations about impacts of man-made structures (Table 31). Residents identified the location of only one man-made structure impact in 2009, on Nigliq Channel north of CD4 (Map 17). As reported for the 2008 study year, Nuiqsut respondents indicated that pipelines associated with Alpine and other developments east of Nuiqsut continued to affect the distribution and migration of caribou in 2009.

Table 31: Descriptions of Sources of Man-Made Structures Associated with Impacts, Nuiqsut, 2008 and 2009

Impact Source Descriptor	Number of Observations 2008	Number of Observations 2009
Pipeline	22	13
Ice roads, bridges	2	1
Infrastructure	2	1
Weather station		1
Seismic lines	1	0
Number of Respondents	**24**	**18**

Stephen R. Braund & Associates, 2011.

Nuiqsut respondents observed that in 2009 more caribou seemed to travel farther south, toward the Ocean Point and Sentinel Hill areas, in a perceived effort to avoid pipelines and other infrastructure in the Colville River delta. Respondents continue to believe that the pipelines are too shiny, causing the caribou to divert to different areas in an effort to avoid them. When researchers noted that CPAI had responded to residents' concerns about shiny coatings on pipelines by installing pipelines with dull coatings, the majority of respondents indicated that the pipelines do not appear dull to them. Residents provided the following descriptions of the impacts of pipelines on caribou availability in 2009:

> *It's mostly the pipeline that is affecting the caribou pattern. In the 70s when we first came, there would be 10,000 in a herd but now, due to the pipeline, it affects the people here and they have to go 30 miles out in all directions to hunt for caribou. It's too shiny. The coating is too shiny. More likely…when we were riding on the ice roads one time, we could see quite a few caribou crossing but maybe in the summertime, due to the reflection of the sun, they don't want to cross. They'll pass right under the pipeline [in the winter].* (SRB&A Nuiqsut Interview May 2010)

> *Also the pipeline is so reflective that sometimes the caribou thinks that is the edge of the ocean, the ice pack, so that is why they go and travel further south of us. Those pipelines are still shiny, it's not coated. All the way from Alpine, pretty much from CD north, all the way to Alpine, it's so shiny; all the way it looks white. And it's reflecting. We always address that with them, and they say they might change that but they didn't. That always [is] a problem with their representative that comes to our meetings.* (SRB&A Nuiqsut Interview May 2010)

> *I think maybe it's this one [pipeline near CD1, CD2, and CD3] that stops the caribou from migrating. There's some open places at the top [north along the coast]. Sometimes they do go down this way, we see the Teshukpuk herd, they come down this way, when we were going to Fish Creek, but they never come out this way [east] They just stay out here [to the west] And that herd [that comes from the east], I think they always go down here to the south of that Meltwater pipeline.* (SRB&A Nuiqsut Interview April 2010)

> *The pipelines, you know, maybe the caribous don't like to go through the pipeline even if they can go through, they hardly don't' do that anymore; they always have to go around somewhere. They always start to go up river and then up around Fish Creek. We can see tracks down by Ocean Point and then going up towards Fish Creek [circle around south and then back north toward Fish Creek]. There used to be big herds going through there almost every year. We would have lots of caribou in my area [before], they go by my house; bunch of caribou would be hanging around in that area and go over towards Fish Creek. Those pipelines, some of them are not too high, and some of them there are places for them to go through alright, but they always be scared or something, I don't know.* (SRB&A Nuiqsut Interview May 2010)

> *Oh, the pipeline is always there, so that's got to be the main reason that the caribou is not coming over this way. Just all of the pipelines I guess. The one [pipeline] that comes from Kuparuk all the way to CD3 and then 1 and 2 and 4. You would have to look for that high spot in the winter time to go across, but sometimes with that snow you would have to go all the way around them.* (SRB&A Nuiqsut Interview May 2010)

One respondent suggested that Alpine pipelines should be buried in order to mitigate impacts on caribou migration, saying,

> *Alpine pipeline: It would be good if they would put that pipeline underground. I'll tell you that. The Alpine pipeline [re-routed the caribou] ever since they put that up we been getting less and less caribou, I'm pretty sure if they would put that underground then we would see that caribou herd, there used to be a lot of caribou coming right through here.* (SRB&A Nuiqsut Interview April 2010)

Impacts of Airplane Traffic

As shown in Table 29, 38 percent of Year 2 respondents (20 individuals) reported experiencing airplane related impacts on their caribou hunting activities in 2009 as compared with 54 percent in 2008. Airplane traffic accounted for a similar percentage of observations during both study years (22 percent in 2009 compared to 24 percent in 2008). As discussed above, the higher percentage of respondents reporting impacts in 2008 may be due in part to researchers allowing Year 1 respondents to describe impacts that had occurred since the Alpine development had begun, whereas during Year 2, researchers documented only impacts that had occurred in 2009. The majority of airplane impact locations were reported near the mouth of Nigliq Channel (Map 17). Residents could not provide descriptions of the airplanes causing hunting impacts in all cases. Available impact source descriptors related to airplane traffic are shown in Table 32.

Table 32: Descriptions of Airplanes Associated with Airplane Traffic Impacts, Nuiqsut 2008 and 2009

Impact Source Descriptor	Number of Times Mentioned 2008	Number of Times Mentioned 2009
Alpine Airplane	8	2
Cessna	7	1
Twin Otter	4	0
Red and White Airplane	2	0
Helmricks Plane	0	1
Sport Hunting Airplane	2	0
White Airplane	2	0
Shared Services Airplane	2	0
Supercub	2	0
Frontier Airplane	2	0
DC3	1	0
DC6	1	0
Blue and White Airplane	1	1
Blue and Gray Airplane	1	0
Red Beechcraft	1	0
Fish and Wildlife Airplane	1	0
Cargo Plane	0	3
Kuparuk Airplane	1	0
General Airplane Impact	0	2
Number of Respondents	**19**	**20**

Stephen R. Braund & Associates, 2011.

In a number of cases, residents reported experiencing airplane and helicopter impacts concurrently (see above under "Impacts of Helicopter Traffic"). Additional observations related only to airplanes included the following:

> *I would say that the flights did have an impact [in 2009]. One time we were out there waiting for a big herd of [caribou.] And then every time that [the herd would start] coming closer, then the big freighter would take off and then it would move [the herd] back again. That is a problem for them.* (SRB&A Nuiqsut Interview April 2010)

> *Alpine, too, they came right up [over] my tent while I was waiting for [the caribou] and spooked them away. There was just that one plane that flew right over me. It was a small plane, like a two-seater or something.* (SRB&A Nuiqsut Interview May 2010)

> *Just the planes on the Colville. That is a concern every summer, especially when the herd is coming. When we got that five there was a herd on this side of the river, and then it turn around and go back that way, and the other one stayed on the bluff. That plane was maybe 500 feet there [from where the respondent was]. I believe it had white stripes. I didn't get the numbers. That was July. I don't know if maybe it was that caribou study?* (SRB&A Nuiqsut Interview May 2010)

> *Just around the Nigliq area [I had impacts]. The cargo planes carry the caribou away every time they land or take off, and they scare them towards the ocean area where it's all shallow and you can't reach them. Right at Nigliq, right at the campsite, where the cabins are.* (SRB&A Nuiqsut Interview May 2010)

Residents' suggestions regarding the impacts of plane traffic were similar to those suggested for helicopter traffic: fly higher, limit the number of flights, and avoid flying during the peak caribou hunting season. One respondent suggested that they limit their airplane activities early in the summer when the caribou herd usually crosses the Colville River delta:

> *I think that they need to change the months that they do their thing in the summer, and do it in the fall time right before freeze up, because once the big herd would come through, then the other ones would follow the trail. But once they get diverted at the beginning, like in June, then they just follow that diverted path. I think they need to wait until that herd past through, and then they can get on with their activity that they need to do, after they already start coming through.* (SRB&A Nuiqsut Interview May 2010)

Another respondent believed that a local resident should monitor summer plane activities to ensure they are not affecting the movement or distribution of caribou, saying,

> *I think that they need to get some people who ride on their planes daily during the summer to see if their trips on the planes are affecting the way that the caribou go. I think they need that to have a local person on there to watch what's going on with the caribou.* (SRB&A Nuiqsut Interview May 2010)

Impacts of Regulations

Impacts attributed to hunting regulations around pipelines were mentioned by 11 percent of study participants for the 2009 study year, compared to 17 percent in 2008 (Table 29). Two respondents reported experiencing impacts related to regulations near CD2 (Map 17). In all cases, residents were discussing the impact of not being able to hunt near the pipelines or other oil and gas infrastructure. Residents described,

> *There is that Conex in there, like right around here, it's an oil spill container, and then we can't really get up there. Can't hunt around there. We really want to go to right there, but we just have to wait for the caribou over there, just wait it out in a different area…. Sometimes it's a whole day of waiting (until they move to an area farther from development).* (SRB&A Nuiqsut Interview May 2010)

> *Yeah, we can't go near the pipeline. You can't shoot near the pipeline. That's restrictive to the hunters. They always warn us not to shoot toward the pipeline or cross under the pipeline. So if the caribou are on the other side, they don't want us to go near it. You have to get permission from Conoco Phillips to go there.* (SRB&A Nuiqsut Interview May 2010)

> *Pretty much, if they're close to the pipeline, we can wait until they get farther away and we can get them so we don't have to shoot the pipeline.* (SRB&A Nuiqsut Interview May 2010)

Impacts of Other Traffic

Nineteen percent of Year 2 respondents reported impacts related to other traffic in 2009 (Table 29) compared to 29 percent in 2008. The impacts occurred near the mouth of Nigliq Channel (Map 17). Airboats constituted all the observations of impacts of traffic other than helicopters and planes in 2009 (Table 33).

Table 33: Sources of Other Traffic Impacts, Nuiqsut, 2008 and 2009

	Number of Observations 2008	Number of Observations 2009
Airboats	7	10
Jetboats	1	0
Rolligons	1	0
Water Truck	1	0
Number of Respondents	10	10

Stephen R. Braund & Associates, 2011.

Residents indicated that airboat traffic generates noise that disturbs caribou and results in hunting difficulty. Concerning the impacts of airboats on their caribou hunting activities in 2009, respondents observed:

> *First time [I experienced an impact] last year was when I saw a couple of airboats up there [Nigliq Channel]. You can hear them things for miles and miles. I've heard people complain about them when they go up river. That was in late May right before it broke up, that is when they start with the airboats and then they are there throughout the summer, on the main channel. There's just so much activity going on with the oil company, they are just trying to check up on everything, make sure there's no spills or nothing.* (SRB&A Nuiqsut Interview May 2010)

> *I've got my camp down there [on Nigliq Channel]. There is always traffic through the river all through the summer, the loud boats all summer. And across is my brother's [cabin]. They drive around until September (June through September). They always come from somewhere from the ocean and then the go through the river all the way to Nanuq, and then they always go back out.* (SRB&A Nuiqsut Interview May 2010)

> *Airboats, they got airboats that are too loud [whole delta area.] That is every summer, July, August, end of June. You can hear the airboat before you ever see it. One time we had an accident a couple of summers ago, and we needed an assist from Conoco Phillips, a guy [fell] in the river, and we heard this thing coming, and it was so loud that we could hear it before we could ever see it. They do exercises, like a lot of oil-spill exercises. It's too shallow for [other kinds of boats] like they could use a jet unit, but they use an airboat for when it's too shallow. They have no access other than the use of the airboat. And then sometimes down by CD4 you will have an airboat and a small medium cargo boat, there is a little slough in there by CD4 and that's the one that they want to dredge in there and try to get into the lake, and then they could use that as a staging area as a possible use area for oil spill response, but the community said no and then they rejected the application for the permit for that.* (SRB&A Nuiqsut Interview May 2010)

> *The air boats, every time they go do their surveys, or checking their Conexes, they disrupt anything that is there and us too. And the caribous will take off, or the seals will pop down; anything that is near that [noise], they take off.* (SRB&A Nuiqsut Interview April 2010)

One respondent suggested that CPAI replace their air boats with jet boats, saying,

Get rid of those air boats and get those four-strokers with jets. Conoco [owns the boats]. Just like the one over here. They're silver, they're just flat bottom boats. (SRB&A Nuiqsut Interview March 2009)

Impacts of Seismic Lines and Activity

Thirteen percent of Nuiqsut respondents reported impacts related to seismic lines or activity in 2009 (Table 29). Respondents were not asked specifically about seismic impacts in 2008; the impact was added to the Year 2 protocol. Seismic impacts were reported west of Nuiqsut (Map 17). One resident expressed concern that some seismic lines had not been removed before the snow melted and said,

Seismic lines, I ran into a couple of them, I don't know if they were abandoned or something. I know that they were doing seismic out in this area, but I talked to some people that I work with about it, and they are maybe going to pick them up, but they can't just leave that wire laying there, especially now it's going to melt, and maybe they wanted to leave them there or something to try in summer time? I don't know. It was between here and Fish Creek in a little creek. It might be this small river here [Ublutuoch River]. It joins into Fish Creek, it's a little one, might be that one right here. I think that they close in May last year [ice roads]; I was out there hunting and scouting around [when I noticed the lines]. (SRB&A Nuiqsut Interview May 2010)

Another individual reported avoiding the area where seismic occurred during the winter of 2009, saying, "This seismic, they do that during the winter time, and I get away from that area, go where there's less activity" (SRB&A Nuiqsut Interview May 2010).

CPAI reviewers noted that CPAI did not conduct any seismic activity in 2009, despite reports of seismic activity impacts on Map 17.

EXISTING MITIGATION OF IMPACTS

In 2009 respondents were asked specifically about eight mitigation actions. They were asked to choose between the following two descriptors: (1) helpful; and, (2) needs improvement. If residents were unaware of a mitigation action, they were not asked to comment on its helpfulness. There was a diversity of opinion on virtually all the mitigation actions (Table 34). Those thought by most study participants to be helpful included: (1) free natural gas; (2) fuel vouchers; (3) local hire; (4) subsistence representatives; and, (5) pipelines at least 7 feet high. Mitigation actions that most respondents described as needing improvement included: (1) dull coating on pipeline; (2) fuel vouchers; and (3) local hire.

Table 34: Respondent Perceptions of Mitigation Actions, Nuiqsut, 2008 and 2009

	Number of Respondents	
	Helpful	Needs Improvement
Dull coating on pipelines	1	16
Pipelines at least 7 feet	10	6
Rounded drilling pads	1	
Fencing around CD 4	1	5
Fuel vouchers	24	15
Subsistence representatives	10	5
Free natural gas	25	4
Local hire	13	9

Stephen R. Braund & Associates, 2011.

Regarding dull coatings on pipelines, a number of respondents indicated that the pipelines in the Alpine area still seemed overly shiny to them:

I do think that this may be something that can help with other things, but pipelines are still impacting [even with dull coating]; it is [not] obvious, but I can't say for sure, it may be helping. (SRB&A Nuiqsut Interview April 2010)

Still shiny. (SRB&A Nuiqsut Interview May 2010)

You can notice them [pipelines] from far away. Even from my camp I can see them [still shiny]. (SRB&A Nuiqsut Interview May 2010)

One individual pointed to the pipeline near Oliktok Point as an example of proper coating on a pipeline, saying,

I keep telling them that pipeline's got to be covered, because it's too shiny. They colored the one down by POW 2 - the one on the Oliktok Point - they colored that, and you can't see that one. It's like a dark green, navy color, army color. (SRB&A Nuiqsut Interview April 2010)

Respondents also commented about pipelines elevated at least seven feet, with many believing that the changes in pipeline height were helpful. Some individuals believed that the pipeline should be even higher than seven feet to account for snow drifts in the winter time and large bull caribou:

The pipeline is at least seven feet in summer time, but not in winter time. (SRB&A Nuiqsut Interview May 2010)

I don't think that the pipelines at seven feet are helpful; I think they are better than the previous heights, but I think that nine feet is better because of the bulls with the racks and the pregnant female. (SRB&A Nuiqsut Interview April 2010)

The raising of the pipeline, I know that's good. It helps them to cross more easily; then they don't have to turn around or go to the gate. (SRB&A Nuiqsut Interview May 2010)

> CPAI reviewers noted that CPAI has safety concerns with pipelines elevated above seven feet when workers are performing inspections and other tasks on the pipelines.

While a high number of respondents reported benefiting from the fuel voucher program in 2009, study participants also believed that the program needed improvement either through changing the methods of voucher distribution or by increasing the voucher amounts. Several people commented that because the vouchers are distributed on a first come, first serve basis, active harvesters are sometimes unable to get vouchers before other less active residents in the community get them. Nuiqsut respondents provided the following comments regarding the fuel voucher program:

You know that mitigations for fuels, you know, what we had in the fall, that goes pretty quick, because we've been impacted quite a bit. (SRB&A Nuiqsut Interview April 2010)

But the good thing is when they give out that gas to hunters. That was helpful, yes, I did use that. (SRB&A Nuiqsut Interview April 2010)

I mean, last year we didn't have the fuel vouchers. I mean, we did, but they only did 20 of them a month and it was first come first serve and so if you didn't go down the first of the month then they were all out. So it was the same people every month who got them, and a lot of people would go get the fuel voucher and put the gas in their truck. Bingo helped with that. They extended the

voucher program when the ConocoPhilips ran out, they extended that for a little while. I think that the city bingo did that all year. I think it was maybe only a couple of months that Conoco did that. (SRB&A Nuiqsut Interview April 2010)

We got a few fuel vouchers from the city when they had them available. I think it's pretty good the way they're doing it. If we needed a fuel voucher they were able to help us. I think it's pretty good. The way they distribute them is good, I know that. (SRB&A Nuiqsut Interview May 2010)

That fuel vouchers, they always help us. But they don't give that out anymore, now they are trying to give that out to each household, divide it between households. They started it just that last year. (SRB&A Nuiqsut Interview May 2010)

The gas vouchers were real helpful, and at first they were giving out 20 gallons, and what was happening was that one family would have so many guys in there and they were the only guys getting them, and then from 20 gallons it went down to 10 gallons, so there was a big fuss about that one family. (SRB&A Nuiqsut Interview May 2010)

It really help us, the local hunters [fuel vouchers], we want to keep it going for next year. It really helps the hunters to go further to hunt when the animals are diverted away from their usual migration path. (SRB&A Nuiqsut Interview May 2010)

CPAI reviewers noted that CPAI does not have control over distribution or administration of fuel vouchers.

Residents were generally satisfied with the subsistence representative program. Suggestions for the program included increased training for the employees and expanding the subsistence representative program to include monitoring of caribou. Respondents' comments included the following:

Subsistence reps, they do a pretty good job about that. I remember when they first started that there were no reps and when there was a spill, but now they are really on top of that, like they do that the same day. They do a pretty good job of that. (SRB&A Nuiqsut Interview May 2010)

Yeah, I think that they need to work with them and get them out on training trips that pertain to their job description. Like if they want to get on the environmental side, then they need to train them and get them good at their jobs. (SRB&A Nuiqsut Interview May 2010)

I'd like to see the subsistence rep employees monitoring the caribou instead of the ice road. (SRB&A Nuiqsut Interview May 2010)

Subsistence reps is actually getting better than before. They actually did get more people for that; it used to be only one and now I think they got more, so that has helped. (SRB&A Nuiqsut Interview May 2010)

I wish that the subsistence reps were hired locally, because industry controls everything, and I think that it could be done better, work with the local people. (SRB&A Nuiqsut Interview April 2010)

Regarding the free natural gas provided by CPAI, respondents agreed that that the program had been helpful to the community; however, some individuals noted that there had been expenses associated with installation. In addition, several people expressed the view that they will eventually have to start paying for the natural gas. Residents provided the following comments regarding this mitigation:

Free natural gas, we used to spend more money on gas and diesel [before the free gas]. (SRB&A Nuiqsut Interview April 2010)

You have to pay when they hook up the propane stove, the hot water heater. I had to get a new stove. I had to pay for it, and pay for the labor when they hook up your new cook stove. (SRB&A Nuiqsut Interview April 2010)

Eventually, our natural gas is not going to be free. How clean it felt, to switch to natural gas from diesel. (SRB&A Nuiqsut Interview April 2010)

Yeah, it is. Very helpful. At least in the new houses. The other houses with the boilers and stuff. They don't work if you shut the door to the bedroom. Because the air can't get in. (SRB&A Nuiqsut Interview May 2010)

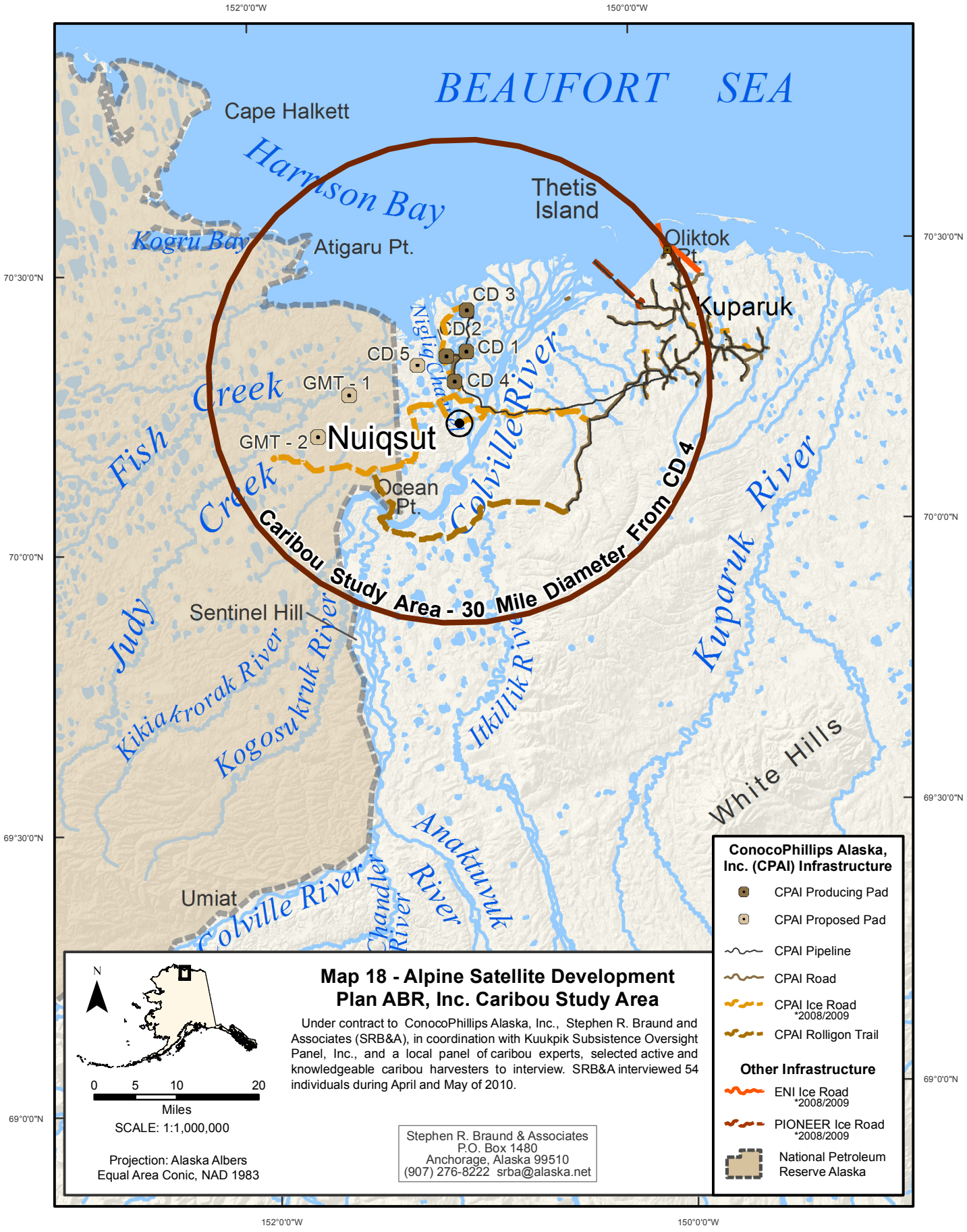
Free natural gas is finally what we been waiting for, for 10 years now. That was part of the agreement with the three parties back then, with the out of court settlement; that's the reason that Nuiqsut got that. The corporation asked for that, but the community has to form a cooperative so that the Borough doesn't do it. (SRB&A Nuiqsut Interview May 2010)

CPAI reviewers noted that CPAI does not control the pipeline from Alpine and was not responsible for administering the installation/conversion to natural gas in Nuiqsut.

TESHEKPUK AND CENTRAL ARCTIC HERD TRENDS (CONTRIBUTED BY ABR)

The Alpine Satellite Development Plan (ASDP) study area (Map 18), which is centered on the Colville River delta (within a 30-mile radius around the CD-4 pad), is used at various times of the year by two neighboring herds of caribou (Rangifer tarandus)—the Teshekpuk Herd (TH) and the Central Arctic Herd (CAH). Based on extensive radio-tracking by the Alaska Department of Fish and Game (ADFG), North Slope Borough (NSB), Bureau of Land Management (BLM), and ConocoPhillips Alaska, Inc. (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.

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


152°0'0"W
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BEAUFORT SEA
Cape Halkett
Harrison Bay
Kogru Bay
Atigaru Pt.
Thetis Island
Oliktok Pt.
Kuparuk
CD 3
CD 2
CD 1
CD 5
CD 4
GMT - 1
GMT - 2
Nuiqsut
Nigliq Channel
Fish Creek
Ocean Pt.
Colville River
Kuparuk River
Caribou Study Area - 30 Mile Diameter From CD 4
Judy Creek
Sentinel Hill
Kikiakrorak River
Kogosukruk River
Itkillik River
White Hills
Umiat
Colville River
Chandler River
Anaktuvuk River
N
0 5 10 20
Miles
SCALE: 1:1,000,000
Projection: Alaska Albers
Equal Area Conic, NAD 1983
Map 18 - 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 54 individuals during April and May of 2010.
Stephen R. Braund & Associates
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(907) 276-8222 srba@alaska.net
ConocoPhillips Alaska, Inc. (CPAI) Infrastructure
CPAI Producing Pad
CPAI Proposed Pad
CPAI Pipeline
CPAI Road
CPAI Ice Road *2008/2009
CPAI Rolligon Trail
Other Infrastructure
ENI Ice Road *2008/2009
PIONEER Ice Road *2008/2009
National Petroleum Reserve Alaska

(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 in (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% 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% 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). The most recent photocensus was conducted in July 2008 by ADFG, producing an estimate of 66,772 caribou, the greatest size yet recorded for this herd (Lenart 2009) and representing a 13% average annual rate of increase since 2002. A photocensus was conducted by ADFG in July 2010 but the results are not yet available. 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 the Arctic National Wildlife Refuge (Lenart 2009, Lawhead et al. 2010).

SUMMARY

Similar to the Year 1 caribou monitoring program, the Year 2 caribou monitoring program focused on hunter observations through active harvester interviews. Changes to the monitoring program in Year 2 included updating active harvester protocols to focus only on one study year and only on Alpine-related impacts. Future years will continue to gather similar data so that Nuiqsut caribou harvesting activities can be compared over time.

The Year 2 report provides the results of the Year 2 active harvester interviews (for study year 2009), as well as the results of Year 1 interviews for comparison. Data collected during both Year 1 and Year 2 included caribou use areas, caribou harvest locations, characteristics of use areas and harvest locations, changes in harvest patterns, assessments of harvested caribou, and impacts on harvesting activities. The most notable differences between Year 1 and Year 2 included a lower reported caribou harvest in 2009 despite a higher number of respondents; increased focus of hunting activities south of Sentinel Hill in 2009; a lack of coastal caribou harvests in 2009; and an increase in the percentage of respondents who reported changes in their 2009 hunting activities, including harvest amount and trip frequency, compared to the previous year. A lower percentage of Nuiqsut residents reported impacts related to Alpine developments in 2009; however, this may be due to the study team collecting data for a longer time period during Year 1 (i.e., since Alpine began). The reasons for the differences in caribou hunting activities will be a topic of discussion with the Nuiqsut caribou panel and community residents.

Future monitoring activities (for Year 3) include a workshop between Nuiqsut caribou hunters and ADF&G, NSB, or ABR, Inc. biologists; a household caribou harvest survey (with the assistance of the Nuiqsut school); and continued contact and coordination with KSOPI and the Nuiqsut Caribou Panel.

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APPENDIX A: PANEL MEETING SUMMARY – SEPTEMBER 30, 2010

Nuiqsut Caribou (*Tuttu*) Panel

September 30, 2010 Meeting Summary

Meeting Time: September 30, 2010 at 3:00pm

Meeting Place: Kuukpik Subsistence Oversight Panel, Inc. Office

Meeting Attendees: Samuel Kunaknana

Jonah Nukapigak

Frank Oyagak, Jr.

Jerry Pausanna

Lydia Sovalik

Liz Sears (Stephen R. Braund & Associates)

The Nuiqsut Caribou Panel met on September 30, 2010 at the Kuukpik Subsistence Oversight Panel (KSOPI) office, with Liz Sears of Stephen R. Braund & Associates in attendance. Meeting topics included replacing/adding Nuiqsut Caribou Panel members, review of the 2010 caribou hunting season, and next steps in the caribou monitoring study. The following is a summary of meeting topics and decisions made during the meeting.

Replacement of Caribou Panel Members

The panel discussed the need to add new caribou panel members because one panel member (Joeb Woods) has passed away and two other panel members have been in the hospital. The panel agreed to invite **Robert Lampe**, **Edward Nukapigak**, and **Dora Leavitt** to join the caribou panel. Panel members also discussed the possibility of assigning **alternates** to the caribou panel.

At a follow-up meeting with KSOPI on October 1, 2010, KSOPI panel members discussed whether the caribou panel should have term limits, as KSOPI panel members do. SRB&A has agreed to draft caribou panel guidelines for review by the Nuiqsut Caribou Panel and KSOPI. It was agreed that the Nuiqsut Caribou Panel will have ultimate control over the development of these guidelines.

Review of 2010 Caribou Hunting Season

The primary impact reported in 2010 was **helicopter traffic**. Several panel members discussed personal experiences with impacts on their caribou hunting from helicopter traffic. In the summer of 2010, one panel member was at her camp on Nigliq Channel and only saw two small herds come by; she reported that she used to see thousands of caribou near her camp in the past. In August 2010, another panel member reported he was hunting caribou on the east channel of the Colville River delta near Helmericks when a helicopter flew at a low altitude over the area. The caribou moved a quarter of a mile to a half a mile further inland; he had to travel that much farther to harvest the caribou and pack it out. A third panel member described an instance last year (2009) in which community residents had heard that a caribou herd was crossing the Colville River; nine Nuiqsut boats headed out to the area where the caribou were reported to be. However, when they arrived, they saw helicopters and planes coming from all directions, diverting the caribou.

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 panel would like a list of names and numbers, both for ConocoPhillips and for agencies that issue industry permits for projects whose activities affect Nuiqsut caribou hunting. The panel would like to know how their concerns and suggestions can be implemented in the permitting process.

Another concern was about the **distribution of CPAI mitigation funds and fuel vouchers** by the City of Nuiqsut. Panel members noted that only 40 fuel vouchers are distributed each month, and that the same individuals often get the vouchers before others in the community get them. The vouchers are given out on a "first come, first serve" basis. Panel members believe the vouchers should be given out to households equally. In addition, panel members discussed concerns about the distribution of impact funds within the community and noted that certain organizations get large shares of the impact funds, while individual residents only benefit from a small percentage of the fund. They believe that the distribution of impact funds and fuel vouchers needs to be reviewed and revised.

Next Steps

SRB&A is currently planning to return to Nuiqsut in January to conduct interviews with active harvester respondents. However, panel members believe that it would be better for SRB&A to return earlier, in November, to conduct these interviews before respondents forget the locations of their hunting activities and harvests. SRB&A agreed to discuss the feasibility of coming early but stressed the need to come at a time when residents are in the community and available to participate. SRB&A will continue to work with the panel on this issue.

Household surveys will still occur in January. SRB&A had a preliminary meeting with the high school principal to discuss involving the high school students in the harvest surveys.

The panel discussed the upcoming workshop between caribou hunters and biologists; they did not have a preference for working with ADF&G, NSB Department of Wildlife, or ABR, Inc. and indicated that involving more than one of these agencies would be best.

Schedule of Year 3 Nuiqsut Caribou Subsistence Monitoring Activities

Monitoring Activity	Proposed Date
Active Harvester Interviews	January-March 2011 or November 2010
Elder Workshop	January-March 2011 or November 2010
Household Caribou Harvest Surveys	January 2011
Panel Meeting to Review Year 2 Draft Report	Between January and March 2011
Hunter/Biologist Work Session	To Be Determined

APPENDIX B: NUIQSUT CARIBOU MONITORING INFORMED CONSENT

Stephen R. Braund & Associates

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srba@alaska.net

Nuiqsut Caribou Subsistence Monitoring Project

April 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.

While in your community, we would like to interview knowledgeable subsistence harvesters about their caribou subsistence use during 2009. We would also like to gain information about changes in caribou use, abundance, health/quality, distribution, and migration and to document and analyze the experiences and thoughts of Nuiqsut residents about changes in subsistence harvest and use patterns as well as impacts to caribou hunting in 2009.

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 C: NUIQSUT CARIBOU MONITORING PROTOCOL, ACTIVE HARVESTER INTERVIEW 2009

NUIQSUT CARIBOU MONITORING PROTOCOL, 2009

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

SECTION A: CARIBOU HUNTING ACTIVITIES, 2009

1. Did you go caribou hunting in 2009? YES _____ NO _____ (IF NO, INTERVIEW IS OVER)

2. Where did you hunt for caribou in 2009? (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 2008, was your hunting area different in 2009? YES _____ NO _____

3a. [IF YES], HOW? _____

_____

3b. [IF YES], WHY? _____

_____

4. Compared to 2008, was the # of hunting trips in 2009 the same, less, or more? LESS _____ SAME ____ MORE ____

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

_____

5. Compared to 2008, was the duration of trips in 2009 the same, less, or more? LESS _____ SAME ____ MORE ____

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

_____

6. Compared to 2008, were the months you hunted for and harvested caribou in 2009 the same? YES _____ NO ____

6a. [IF NO], HOW? _____

_____

6B. [IF NO], 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, 2009

1. Thinking about the caribou you shot or harvested in 2009, 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: _____

_____

_____

_____

_____

Approximately how many caribou were abnormal? _____

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

Did you use these caribou? YES _____ NO _____

SECTION C: IMPACTS ON CARIBOU HUNTING, 2009

1. In 2009, 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 2009, 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 2009? 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	

APPENDIX D: HARVEST ACTIVITY AND HARVESTED RESOURCE ASSESSMENT CODES

Table D-1: Harvest Activity Assessment Codes, 2009

Numeric Code	Code Name	Notes
	Change Observation 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.
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 either did not travel to usual caribou use areas, or traveled to new areas in search of caribou.
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.
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.
	Explanation of Change Codes	
110	Need more	Used in response to why respondent harvested or used more caribou.
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").
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").

Numeric Code	Code Name	Notes
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").
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").
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.
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").
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	

Numeric Code	Code Name	Notes
650	Development	[See previous page]
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").
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").
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.
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.
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.

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Table D-2: Harvested Resource Assessment Codes, 2009

Numeric Code	Code Name	Notes
	Change Observation Code	
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.
876	More Parasites	Respondent observed more parasites than usual in harvested caribou.
	Change Explanation Code	
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").
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.
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.
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.

Stephen R. Braund & Associates, 2011.